MEDIA LAB 20 Helsinki

Author:
Olli Sulopuisto

Editors:
Philip Dean, Kati Åberg

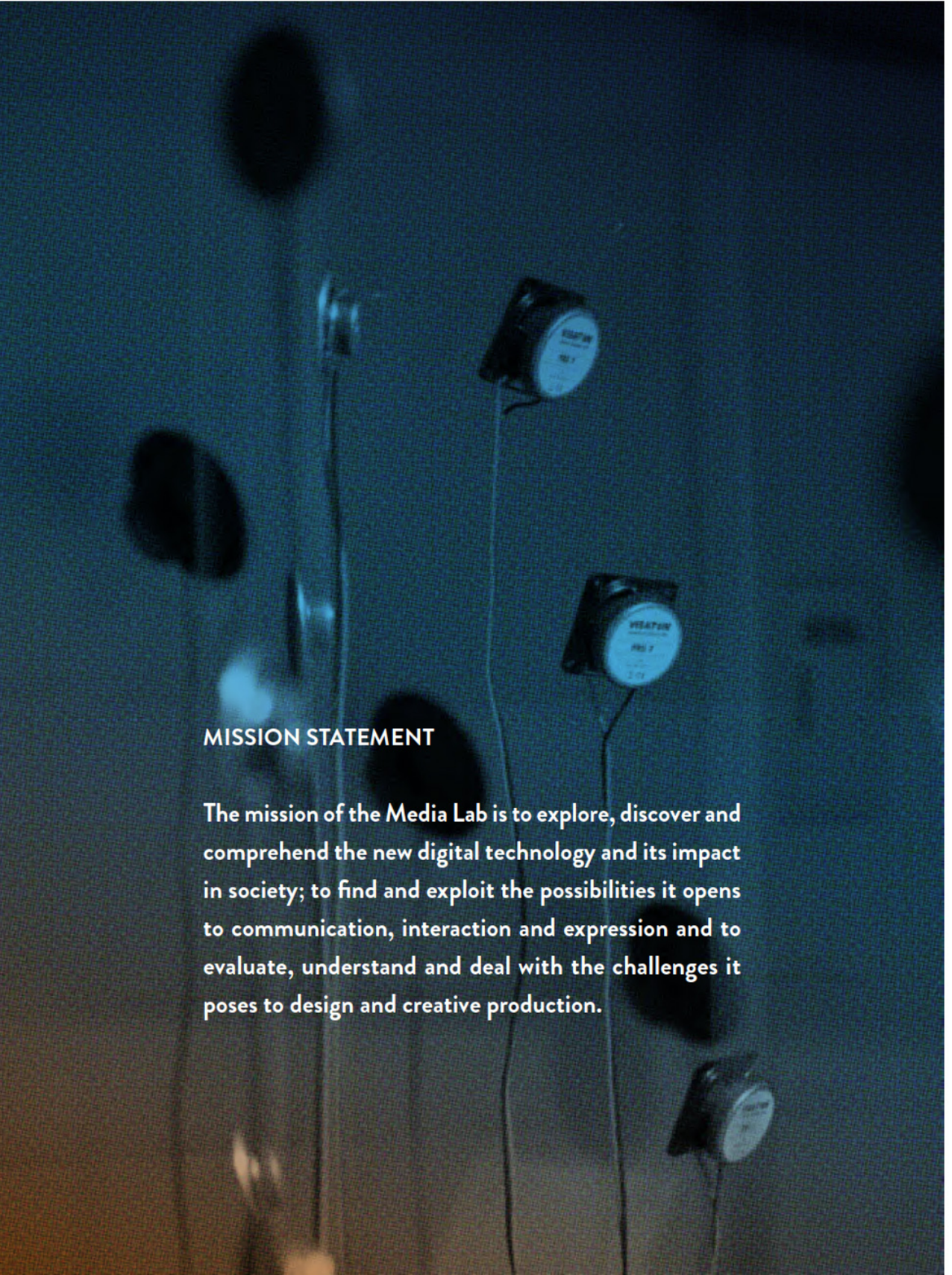
Contributors:
Lily Díaz
Teemu Leinonen
Antti Raike
Mika Tuomola

Graphic Design / Layout:
Gaspar Mostafa, Anja-Lisa Hirscher

Contact:
http://medialab.aalto.fi

ISBN 978-952-60-0063-3 (print)
ISBN 978-952-60-0064-0 (pdf)

Printed by Ecoprint
Tallinn, Estonia, 2014



MISSION STATEMENT

The mission of the Media Lab is to explore, discover and comprehend the new digital technology and its impact in society; to find and exploit the possibilities it opens to communication, interaction and expression and to evaluate, understand and deal with the challenges it poses to design and creative production.

TABLE OF CONTENTS

MEDIA LAB HELSINKI AT 20

Philip Dean

This book is a celebration of 20 years of work at the Media Lab Helsinki. A mass of activity fits into a span of 20 years and I hope that this book and our other celebratory exhibitions and events are successful in revealing the breadth and depth of all the work. Change has been an obvious and constant identifying characteristic for the lab throughout its history. For the readers of this book it's important to remember that the Media Lab is part of an art & design community and that, despite the inter-disciplinary nature and approach of the lab that's clearly described in the following chapters, our main points of reference have to be those which are relevant to creative practice, artistic experimentation and the evolving theories and methodologies of design, as well as their application in critical and developmental work.

The lab has remained faithful to its Mission Statement that we jointly compiled in the mid-1990s:

The mission of the Media Lab is to explore, discover and comprehend the new digital technology and its impact in society; to find and exploit the possibilities it opens to communication, interaction and expression and to evaluate, understand and deal with the challenges it poses to design and creative production.[1]

Now, in 2014, 'the new digital technology' that we experienced in the 1990s has been developed and adopted on such a scale that many people, especially the young, find it very difficult to imagine a world without the possibilities for constant, affordable, real-time, digital communication across the globe. So the starting points for the lab's current research are very different now than they were in 1994, around the time when the first consumer-level web browsers were in their beta development stage, a digital movie was the size of a postage stamp and the first mobile phones were the objects of desire for business executives.

Creating and sustaining the Media Lab Helsinki has involved taking risks, experimenting and accepting failure from time to time. In our art & design context, as in science, we need to be able to experiment and to consolidate all things learned from our successes, failures and our numerous collaborations with experts from academia, industry and the public sector. We have learned the value of networks and working together towards shared goals. I believe our digital society was only made possible by persons who understood that global development in expert networks was the key to ensure shared resources and shared results for the benefit of all. In the current climate of academic administration and its mania for evaluation we are often puzzled by the attempts to develop and harmonize evaluation criteria which effectively results in talented minds being encouraged to 'protect' their results from the exploitation of their peers. We encourage openness and sharing and the need for our designers to deal with the world's wicked problems.

I would like to thank all those who have supported the Media Lab though the last 20 years, both within our home institutions and our external partners and networks.

Special thanks goes to all my colleagues; the staff and students of the lab throughout the 20 years whose work is now being celebrated in this book and in the related exhibitions being shown in Helsinki during September 2014. Keep up your good work! I sincerely hope we can take another look at the lab's progress in 2024 and be positively amazed by the changes that occurred in the lab's third decade.

Finally, this book would not have been possible without the resilient efforts of our producer, Kati Åberg and our editor, Olli Sulopuisto who now surely both truly understand the lab's *hands on with minds on* mantra and the fuzzy nature of our deadlines.

Professor Philip Dean
Director of Media Lab/Department of Media
Aalto University School of Arts, Design & Architecture
Espoo 14.8.2014.

[1] P Dean, K-H Kommonen, M Tarkka, 1995

CONTRIBUTORS

Pipsa Asiala: Media Lab student project Producer, Tutor of MA theses. Joined the lab in 1999.

Andrea Botero: Project leader, Arki research group. DA in New Media (2013).

Nuno Correia: Post-doc researcher/Lecturer. DA in New Media (2013).

Philip Dean: Professor of New Media Management. Director of Media Lab Helsinki 1994 - 7.2008. Head of the Department of Media 2010 -, Director of Aalto Media Factory 11.2009 -.

Lily Díaz: Professor, Systems of representation and the design of digital cultural heritage. Research group leader (SysRep). DA in New Media (2002).

Perttu Hämäläinen: Professor of Game Design. Research group leader. MA in New Media (2001). D.Sc. (tech) (2007).

Antti Ikonen: Lecturer, has led the MA in New Media; Sound in New Media Programme. MA in Art & Media (2011).

Kari-Hans Kommonen: Member of Media Lab planning team 1994. Teacher. Director of Arki research group (1997–).

Pekka Koponen: Development Director at Forum Virium Helsinki. Member of Media Lab planning team 1993 - 4.

Teemu Leinonen: Associate Professor of New Media Design and Learning, Research group leader (LeGroup), Director of Media Lab 8.2008 - 12.2009, Vice-Dean of School (2014 -). DA in New Media (2010).

Marjo Mäenpää: PhD, Director at Division of Art Policy at Ministry of Education and Culture. Head of Media Lab's New Media Program for Professionals (1999 - 2005).

Antti Raike: Senior Advisor in accessibility at Aalto University. Media Lab Postdoctoral researcher (Academy of Finland, 2008 - 2010). DA in New Media (2005).

Perttu Rastas: Special planner at Kiasma Museum of Contemporary Art. His professional career has been focused on the development of Finnish video and media art as curator, producer, event organizer and expert.

Koray Tahiroğlu: Post doctoral researcher (Academy of Finland, 2009 - 2011), senior researcher and leader of Sound and Physical Interaction (SOPI) research group. DA in New Media (2008).

Heidi Tikka: Media artist. Media Lab Doctoral candidate, former Professor and teacher. Licentiate of arts (1999).

Mika Tuomola: Director of Crucible Studio. Teacher, Media Lab doctoral candidate. MA in New Media (1997).

Rasmus Vuori: Lecturer, has led the MA in New Media Programme. Media Lab Doctoral candidate. MA in New Media (2004).


Andrea Botero

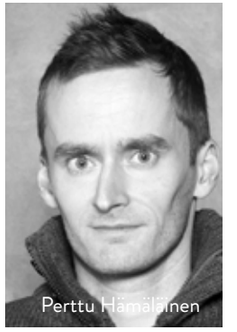
Philip Dean


Rasmus Vuori

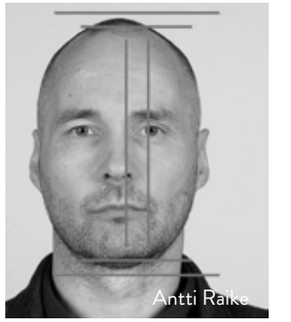

Pekka Koponen

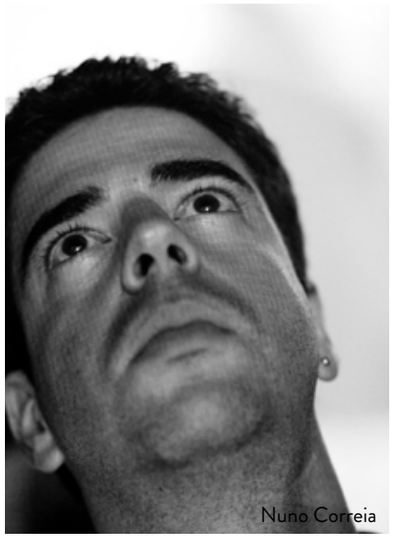

Pipsa Asiala


Antti Ikonen


Perttu Hämäläinen


Koray Tahiroğlu


Antti Raike


Nuno Correia


Mika Tuomola


Heidi Tikka


Lily Díaz


Teemu Leinonen


Kari-Hans Kommonen


Perttu Rastas


Marjo Mäenpää

MEDIA LAB

chapter 01

Kinect is Microsoft's motion-sensing accessory for the Xbox 360 gaming console. When it was launched in November 2010, Koray Tahiroğlu was teaching a course on Physical Interaction Design at Media Lab Helsinki, where he's a research group leader and lectnrer.

During the course, stndents experiment with different ways of physically interacting with compnters. One of the students, Dipti Sonawane, built her course project around the Kinect sensor. After explaining what it does with a few sentences, she launched into her demonstration. On-screen fireworks went off as she waved her hands around.

It's a remarkable feat, given that the course lasted all of three weeks, the device was brand new, and it wasn't even properly documented yet — whatever functionality was available had been teased ont and scraped together by a network of loosely connected online hackers, who then made their findings available for anyone to use.

This is the kind of thing that happens at 'the Lab', as it's affectionately known. Students turn out original conrsework nsing nndocnmented hardware systems in a matter of weeks if not days, just because they can.

The Media Lab was born 20 years ago into a world withont iPhones and iPads, with no Google or Facebook, where the idea of streaming high definition video from the edge of space was pure sci-fi, 4G mobile data transfer speeds were beyond belief, and where the World Wide Web itself was a new invention.

The Media Lab started ont in what was then TAIK, the University of Art and Design Helsinki. In the first year, the staff and students nnmbered fewer than two dozen.

Soon the Lab was punching above its weight. It brought in research grants, international students, and managed collaborative projects with companies and nniversities all aronnd Europe.

Being the first has meant that the Lab has had time to think about many problems that other institntions — universities, companies, public government — are now faced with.

It also means that there are insights to be gained from understanding how the Media Lab fnnctions and how it has taken care of its three core missions: research, education, and contribnting to society.

Take ARKI, just one of the five research groups the Lab currently hosts. It was established under a different name in 1997 and has since organised international conferences, done research in collaboration Nokia, Elisa, and VVO, with several rounds of funding from Tekes, the Finnish Funding Agency for Innovation and has been a partner, as well as coordinator, in numerous EU projects.

The Lab has harboured students from different cultural and educational backgrounds with all the benefits and the problems it brings. Some of them have stayed on, finished their doctoral studies, and established new research groups that now contribute to the Lab's academic output.

The Media Lab is a new media and design school, not an engineering school or an art school. The fundamental decisions about the Lab's structure and approach have weathered the changing times. The Media Lab has adapted as the technological and societal landscape has gone through significant change.

At the Lab design isn't thought of as something merely decorative, but as an all-encompassing approach that makes use of all the senses, is accessible for all, and maintains an ethos of pro arte utili, usefulness above all. There is a belief that design can truly change the world.

The Lab has been open enough to accommodate media art and media artists, even though it has never been an art school. There's more to be gained from letting research cross-pollinate with art than from shutting it off — just as there's more to be gained from letting in people with wildly different academic backgrounds, because diversity is strength.

All this and much more is told in more detail in this book, and yet it's woefully incomplete, a mere tip of an iceberg.

The beginnings were humble. When TAIK moved to Arabianranta in the mid-1980s, the university only owned a couple of computers and they weren't meant for students.

There were a few pioneers who had started using computers early on: Pekka Koponen was teaching multimedia within the faculty of Art Education in the late 1980s, the late Hilkka Sillanpää-Suominen used CAD in textile design, and an experimental MA in 3D animation and design was launched in 1992, headed by Antti Kari.

Then there was the Computer Aided Photography lab, which Philip Dean managed to expand with a research grant from the Swedish Hasselblad foundation.

These were the elements from which the Media Lab was built. It was to be a new department with a new MA programme and it was to function as its own experimental unit that would tackle education and research in New Media, rather than a computer literacy training facility for the rest of the university.

The first investments into computer graphics hardware at TAIK were very expensive, which made the risks of being too far ahead of the pack obvious early on. Still, a decision was made to always invest in state of the art new media production environments at the Lab.

"The Media Lab had to be essentially experimental and research-oriented, but we weren't going to get too deeply involved in that first wave of technology and research, because it's incredibly expensive and very risky," says Philip Dean.

Dean is Professor of New Media Management and Head of the Department of Media, and has been at the Lab from its inception in 1994, when the first MA programme started with 18 students and four members of teaching staff. Soon after that the World Wide Web emerged, which forced a re-evaluation of the department's curriculum and context.[1]

Things progressed quickly. The Media Lab became a full faculty in 1998, largely thanks to its success in research projects that brought in external funding. By 2002 about a third of all external funding to TAIK came in through the Media Lab.

The biggest organisational change in the history of the Lab happened in 2010 when Aalto University was established, bringing together the University of Art and Design Helsinki, Helsinki University of Technology and Helsinki School of Economics.

Since then the Media Lab is a part of Aalto University's School of Arts, Design and Architecture and more specifically a part of the Department of Media, where the two other degree programmes are photography and graphic design. The Lab moved from Arabianranta to Otaniemi in early 2014.

The mission statement of the Media Lab has managed to stay relevant, even though in 20 years everyday life has been digitalized to an extent and at a speed that would have been hard to grasp in 1994.

[1] The mission statement of the Media Lab dates back to 1995. According to it the Lab is an institution that aims to be actively involved in information society development through critical participation as artists and designers. It includes the need to forge new methods and practices, and educate people whose expertise extends beyond the traditional gamut of art and design.

When the Media Lab started in 1994, Nokia had just introduced the first digital mobile phone, the Nokia 2110. Before that phones had been analogue, landlines as well as NMT mobile phones. The web was still a newcomer, and the Internet in all its forms — the web, email, and all the rest — was not part of everyday life.

"We've gotten used to plugging in a cable and getting multiple megabits per second. Back then we had to rely on phone modems, which were a serious limitation on the things you could do on the web. The constraints were different," says Kari-Hans Kommonen, Director of Arki research group.

He was one of the pioneers of multimedia in Finland in the early 1990s, building graphic user interfaces for enterprise systems. He knew what the technology was capable of and where its weaknesses lay. More importantly, he knew what was going to be possible in the near future as soon as the technology caught up.

Back in the early 1990s, the Internet was largely an academic playground, because companies and individuals didn't yet have regular access to it.

Still, Kommonen's research group managed to imagine a future that aligns well with the reality we're living in now. It was to be a world of convergence, where all data is digital, all devices are digital and everything is interconnected — meaning, a rather accurate picture of our cloudified net life circa 2014.

The vision isn't any less impressive even though not every detail matches up with what happened, some of the uses envisioned might still be too high-flying, and some of them have been commodified beyond recognition. That isn't the point. Whereas most research projects dealing with the near future focused on a single device and imagined what might happen to it: the future of television, the future of music players, the future of phones, Future Media Home approached things from the concept of the computer as a meta medium.

"KOMMONEN'S RESEARCH GROUP MANAGED TO IMAGINE A FUTURE THAT ALIGNS WELL WITH THE REALITY WE'RE LIVING IN NOW"

"Back then it felt somehow progressive because the reality of it was still so distant. And now we're living it, even though not everything has gone as we predicted. The development of technology has changed society as we thought," Kommonen says.

Indeed, you have to learn and relearn different tools all the time, but ultimately the principle stays the same: figure out how to make them work.

There's been a lot of staying power at the Lab. Its DNA was defined two decades ago, but it can still be recognized in the current version, and there's no urgent reason to redefine it.

One aspect of the Lab that Kari-Hans Kommonen finds important is the way the Lab functions as a transdisciplinary department. It is staffed by people from very different backgrounds, but their work crosses the limits between disciplines and competences.

"We don't care about those limits when we're working on a problem. We all share a design interest and a course of action," he says.

The Media Lab was created strategically on the premise of interdisciplinarity, which allows people to concentrate on their own area of expertise in a broader developmental context. No one is forced to look at other traditions just for the sake of it.

One other feature that sets the Media Lab apart from most other university departments is the value that's given to prototyping. Sometimes the prototypes are barely functional web applications, but they fulfil their purpose, which is to function as the concrete manifestation of an idea.

"I've tried to argue that these things are a part of our research findings. They are an argument for an idea," says Teemu Leinonen, Professor of New Media and Learning and vice-dean of school from 2014.

Being initially a part of TAIK and later the Aalto School of Arts, Design and Architecture has been beneficial in this aspect, because the concept of artistic research is familiar to everybody and therefore demo culture has been relatively easy to understand.

Experience with prototyping can also be a competitive benefit when working together with other organizations. The Media Lab doesn't merely produce visual mock-ups, wireframes showing what things should look like, but functional, if sometimes crude, prototypes.

Still, that doesn't mean technology rules supreme. Rather the role of technology at the Media Lab is essential but still subordinate. It is, after

all, an Art and Design school, where the goal is to express things instead of getting hung up on the details of the implementation.

The hands-on mentality of the Lab has made an impression on many of the people who've studied and worked there. Antti Raike, currently Senior Advisor in accessibility at Aalto University, enjoyed the moments when a concept came together.

"THE GOAL IS TO EXPRESS THINGS INSTEAD OF GETTING HUNG UP ON THE DETAILS OF THE IMPLEMENTATION"

"That made me feel like the Lab's work was done. Others would take care of things from there on, be they start-ups or something else," he says.

Maybe these characteristics help explain why people can have difficulties in pinning down what the Lab is exactly.

Andrea Botero, who works as a project leader at the Lab, tells the story of a bus trip she recently took. A young boy and girl were sitting in the back of the bus. Botero didn't recognize the boy, a foreigner, but could hear from his talk that he was a student of the Media Lab. The girl was probably an engineering student.

"He was trying to explain what his studies were like and he was having a lot of trouble," Botero laughs.

She recalls the conversation: "I'm studying something like sound design, but it's not really that," says the boy.

"Why's that?", she asks.

"Well, usually sound design is for film. But there's also mobiles and games and other things."

"Ah, okay, so is it like research?"

"No, no, we do a lot of projects."

"So you don't have courses?"

"We do a lot of projects and get credits for almost anything we do."

"How is it possible? They don't tell you what to do?"

"No, I can do my own stuff and get credits for it."

"Ah, interesting."

At this point Botero felt she needed to butt in: "Sorry to interrupt, I also work at the same department and you don't get credits for *everything*."

He scrambled to explain: "Well, not anything..."

The girl quickly replied: "No, no, I know what you mean. In our department the teachers tell us what we have to do and then we do the work. At least there he can say what he wants to do and then do the work."

"Oh yes, of course we have to work," the boy affirmed.

Botero let them continue the discussion. She recognized something familiar in the situation: you do an art project and find it very difficult to explain it to other people.

"You can make something coherent and learn about it without knowing it in the beginning. Obviously he couldn't explain what he was studying, because there's no clear domain," Botero says.

So yes, the Lab can appear amorphous and the work being done there somewhat mystifying as it straddles the line between art and science.

"I know that quite often the research is a bit of a mystery for our students as well. But everyone gets a chance to gain insight into the research at the Lab's biannual Demoday", Philip Dean says.

What does a Demoday look like? In May 2014, approximately a hundred people — students, staff, hangers on — had gathered at the Lab's new facilities at Otaniemi. The door was propped open, making it easy to find the right place. Two huge screens glow in the back of the room.

The presenters take to the stage in quick succession, staff and students all mixed together. The student presentations aren't graded, but they are a part of their coursework. Even the student presentations are snappy and to the point, which is an impressive feat. It's not a coincidence, for they've had a dry run the day before.

What's more, the applauses at the end of the presentations don't feel like a mere courtesy, but a genuine show of interest.

The presentations end with a request to come see the work in one of the adjoining rooms. Even a glimpse into them is mesmerizing: in one room black and white rain is being projected on the wall.

This is what learning by doing must look like.

Of course, Helsinki Media Lab isn't the only media lab in the world. One question every institution with this particular name has do deal with is the relationship with MIT Media Lab, which was established by MIT Professor Nicholas Negroponte and former MIT President Jerome Wiesner in 1985. It has become the prototype that all media labs are compared with.

"Was it wise to call our unit a media lab? Does that create a bad confusion or a good confusion?", Kari-Hans Kommonen recalls the conversations.

The name provided a lot of leeway. What used to be separate media were being brought together by digitalization, and once you were working in the digital domain, everything could be seen as media, examined and experimented with similar tools in similar ways.

"We didn't want to surrender the genre to MIT Media Lab alone. It's a great research laboratory that produces great results, but we're different," Kommonen says.

The comparisons to MIT Media Lab don't bother the staff of Media Lab Helsinki, because the differences between the two are obvious. Philip Dean emphasizes that probably the most significant difference for Media Lab Helsinki was the predominantly art, design, and production context. One of the differences is that back in the 1990s every student at MIT Media Lab had to be able to program a computer. The Helsinki founders thought that excessive.

"WE DIDN'T WANT TO SURRENDER THE GENRE TO MIT MEDIA LAB ALONE"

As Kommonen sees it, one of the defining features of MIT Media Lab has been a product-centric approach, whereas Media Lab Helsinki was also designed to be a place for experimentation, where the focus was on the ideas and the means instead of the end result per se.

In a nutshell, the task of Media Lab Helsinki is to educate experts who know what technology can be used for, but not everyone who graduates necessarily has to work in creating technology.

Other reference points for the Lab are the ex-Hypermedialaboratorio (Hypermedia Lab) at Tampere University and the Swedish Interactive Institute, which describes itself as an experimental IT and design research institute.

Shifting the focus closer to home, Aalto School of Science has a Department of Media Technology that was born in 2008 when the then-Helsinki University of Technology merged the Laboratory of Media Technology with the graphics, audio, and media groups from the Telecommunications software and Multi Media Laboratory. The students of Media Lab and Media Technology departments have been sharing studies for a long time, but some differences remain.

"Media Technology is still an engineering department, whereas I've always thought the Media Lab as being a part of the new media and the media art scene," says Teemu Leinonen.

Some of the things that used to be the sole territory of the Media Lab have spread into other parts of the university. It's now far from the only place that deals with questions related to the Internet or social media, but whereas many of the other departments are focusing on the latest fad, be it wearable computing or the Internet of Things, the Media Lab has a different point of view.

"For me this is the place where we look at the fringes of stuff that is just popping up. When I came here, I was interested in the fact that when you talk about media, you can talk about people," Andrea Botero says.

Her experience at the Lab has taught her to link together the subjects she was interested in when she first started studying there. It also widened her perspectives, because she had worked on several multimedia projects prior to this in the department of design, but the teams were more homogeneous and projects were more about product development.

"The Media Lab had some kind of utopian flavour to it, that we can create things that make a difference even though it's almost impossible," she says.

It's reminiscent of Alan Kay's dictum about inventing the future being the best way of predicting it, but with a slightly different twist.

"Not any kind of future, but an interesting one. You can create all kinds of products, but are they meaningful?"

Twenty years of working at the Lab seems to have been a fertile approach for Kari-Hans Kommonen. It has advanced his own thinking in understanding the concrete results a design decision might have in somebody's life.

"It's a fantastic thing that I've been able to read so much as a part of my job. In a transdisciplinary job you have to keep learning new things about law, intellectual property rights, sociology, anthropology, history, evolution."

What other features set the Media Lab apart? Heterogeneity has always been one of its working methods: the more people you have thinking about the same problems, the better the solutions will be.

It's a function of diversity — no one person can know everything, and what looks like a boring problem to one person, can be a fascinating question to someone else. As Eric S. Raymond has stated in the so-called Linus's Law about software development, 'Given enough eyeballs, all bugs are shallow.'

"The important thing at the Media Lab is that everybody can be themselves. In our group people can naturally hold on to their own beliefs, but they have to be willing to discuss things that affect us all," Kari-Hans Kommonen says.

One aspect of diversity is the gender ratio, which is very even, considering the stereotypical image people often have of computer-related subjects. Around half the students are women. Teacher, producer Pipsa Asiala has also been impressed by the Lab's many female teachers.

"When a person first walks through the department, they'll just notice the computers," Asiala says.

But it's not about the devices, it's about the people. For example she praises Tove Idström, the Finnish dramaturgist who's been teaching a storytelling course at the Media Lab for over a decade.

"She emphasizes the meaning of education. The spirit Tove manages to create is incredible. You walk past the classroom and hear these people, our so-called nerds, reading Shakespeare's sonnets out loud."

There are times when the difference between the Lab and other departments really hits home. Antti Ikonen, Lecturer and head of the Sound in New Media MA programme, recalls a recent conversation he had with colleagues who teach architecture and landscape architecture. Their goal is to educate professionals who are entering a regulated profession with clear prerequisites.

The contrast with the Media Lab is stark, as work there is characterized by what Ikonen calls continuously wading through fresh snow: "Whenever you see a beaten path, you have to diverge from it."

"Maybe the special thing about the Media Lab is that the field takes shape with the graduating students, who end up doing different things," he muses.

To paraphrase the poet Walt Whitman, the Media Lab contains multitudes. It shows in the way the teaching brings together many separate strands.

"I somewhat shy away from the concept of discipline, because I think that design and art education and research aren't necessarily a discipline of their own. Clearly, you need to have methods and processes, but here the emphasis is on creating, not analysing," says Rasmus Vuori, lecturer and the head of the MA in New Media Programme.

Media culture is another component that Vuori likes to include in the themes that run through the Media Lab, alongside the often mentioned design, technology, and media art. The Lab has had quite a few sociology students in its time and they've done their part to widen the perspective by concentrating on the phenomena caused by technology instead of design or technology per se.

What happens in new media when technology enables surveillance in an unforeseen way? What is the designer's responsibility? These are kinds of questions Vuori thinks media culture can help answer — and which should be discussed at the Media Lab.

Twenty years is a long time, encompassing many achievements and many learned lessons, many of which are applicable to Aalto University as a whole. After all, it was formed only quite recently in 2010 and as a relatively large university, it seems to have a kind of institutional tendency to shower attention on its newest creations.

This results in the Media Lab, the multi-disciplinary pioneer of Aalto, sometimes feeling ignored. But even if Aalto's pioneering developments somewhat overshadowed the Lab, there's really no point in reinventing the wheel or fixing something that isn't broken.

"WHENEVER YOU SEE A BEATEN PATH, YOU HAVE TO DIVERGE FROM IT."

"In every evaluation, in education and research in our field, the Media Lab has been stated to be of very high international quality. For example, the Media Lab was named Top Educational Unit in the Universities' Evaluation Council in 2003," Dean says.

He believes the Lab has a lot to of offer Aalto University as an agent of change. For example, being a part of a bigger whole has its upsides. Collaborations with e.g. the department of Media Technology in game design are working pretty seamlessly, and already many students from Aalto School of Science are doing minor studies at the Lab.

"Throughout our history it's been a challenge to communicate what we're good at to those who wish to see academia as a neat row of pigeonholes. I believe that we have as much potential now as we had 20 years ago as a platform for artistic and academic excellence in our field," Dean says.

Teemu Leinonen concurs: "A lot of the things that are now Aalto's goals are the kinds of things we've been doing for 20 years."

Leinonen also believes that the Media Lab has a lot to contribute to the university as a whole. Both Leinonen and Dean are interested in the idea of antidisciplinary approach, which is something Joi Ito, the current leader of MIT Media Lab has also embraced.

"We want to have a flat organization where people can join the Lab if they have a worthwhile idea, so that you wouldn't have to think whether this is allowed or not, but could just do it. The idea comes from hacker culture, where DIY is held in high respect," Leinonen says.

So how would that work in practice? For one, it would mean that the formal requirements for students wouldn't be very high. Instead emphasis is placed on experience, vision and creativity. Antidisciplinarity puts the emphasis on freedom: if the work you're doing is valuable, it doesn't matter who you are or what your background is. The discipline is less important than the end result.

Universities aren't famed for their cross-departmental flexibility, so Leinonen understands that an antidisciplinary approach might well irritate some people, but he thinks the benefits of a widely defined area of research — in this case, (new) media — far outweigh the drawbacks.

In the late 1990s, there was discussion about the place of the Media Lab within TAIK. There were moves for an internal reorganization, where the Lab would have become part of the design department. There was a strong emphasis on audiovisual production and interactive narrative at the Lab and merging with the design department would have shifted the focus.

"The connections between audiovisual culture and digital media were elastic. It felt like everything was still possible and we were searching for options," says Heidi Tikka, a visual artist who taught at Media Lab.

Andrea Botero also remembers the discussions.

"We didn't want to be either-or, we wanted to be both," she says.

One testament to how the Media Lab has managed to integrate students from different backgrounds is the career of Perttu Hämäläinen, who's now Professor of Game Design.

When Hämäläinen started his studies, he was majoring in signal processing at HUT, the Helsinki University of Technology, but felt like something was amiss. After learning of the existence of the Media Lab, he thought it sounded like a place he might like.

"I was a student of technology who didn't want to be a student of technology," he now says.

Hämäläinen came in knowing a lot about computer science but he credits his time at the Media Lab for widening his perspectives on how it could be applied. He met with a lot of people with different backgrounds, both students and teachers.

During his studies, being a former engineering student of technology who'd gotten used to empirical sciences, some of the more philosophical lectures made him perplexed. Slowly he learned to accept the fact that there are different philosophies of science.

It's also something he thinks all of Aalto University will have to deal with. When HUT was still its own university, the students had no mandatory lectures on philosophy of science, whereas at the Media Lab it was a subject that couldn't be avoided.

A problem a unit like the Lab has to deal with is the Finnish university sector's current infatuation with metrics. It seems that everything has to be quantifiable, measured, and comparable with other units both within the university and outside it. The larger the spectrum the university covers, the more problematic the definition of key performance indicators becomes. Evaluation criteria are a big on-going debate.

This is acutely felt in an interdisciplinary unit like the Media Lab.

"We should be evaluated not merely on the research output, but also on the artistic output, the student demos and so on," Dean says.

Mika Tuomola, Director of Crucible Studio and teacher, is convinced of the need to keep the essence of the Media Lab Helsinki intact. An essential part of the Lab is blue sky research, meaning artistic and scientific explorations that deal with resolutely non-commercial subject matters.

"Artistic experimentation is both our basic research and our nuclear physics. We need resources just like nuclear physicists need particle accelerators," he says.

Freedom is necessary, because there's always going to be external forces pushing and pulling in different directions.

For Andrea Botero, what's important at the Media Lab is that people aren't afraid of getting their hands dirty working on new things and trying to understand how they work; a place where people can fearlessly take the machine apart.

"I hope it stays that kind of place. I appreciate that," she says.

In many ways, the Media Lab has been an early adopter of practices that would later become more widespread in academia, business and the public sector. The Lab has been a springboard for many people who've disseminated the lab's best practices in their later work elsewhere.

One of these people is Marjo Mäenpää, director at Division of Art Policy at the Ministry of Education and Culture. She still wrestles with many of the same questions that kept her busy during her years at the Lab. "My mission and vision, along with my background from TAIK, has made me certain that creativity and artistic activity have to be the basis of everything. Good, strong art-based teaching and understanding design — which is what the Media Lab does — is extremely important," she says.

"THE MEDIA LAB HAS BEEN AN EARLY ADOPTER OF PRACTICES THAT WOULD LATER BECOME MORE WIDESPREAD IN ACADEMIA, BUSINESS AND THE PUBLIC SECTOR"

Her first contact with the Media Lab was working as a producer on the National Museum of Finland's multimedia kiosks in 1998. After that she taught scriptwriting and producing, and became the head of the New Media Program for Professionals from 1999 to 2005.

It included a mixed bag of people from different areas — the Finnish Broadcasting Company, a gaming company, and so on — who all had different backgrounds. The timing was difficult, because at the turn of the millennium the Finnish economy was suffering and the new media sector was especially affected.

"Many people lost their jobs and we had to rebuild everything from scratch," Mäenpää says.

The same slump resulted in a lot of queries to the Media Lab, asking if the students could build web pages on a budget, effectively being asked to compete with the new media industry. These projects were turned down, but the students did work on large-scale projects with companies like Sonera and non-profits like The Finnish Association for Nature Conservation. Mäenpää worked as a producer on these and tutored the students so that their contribution resulted in study credits.

There are also other lessons she has taken with her. Shared agency was a feature of the Media Lab that Marjo Mäenpää learned to value. It meant leadership that helped multiprofessional teams work efficiently together, respecting each others' expertise, having trust in each other and becoming more than the sum of their parts.

"The spirit of the Media Lab is valuable and I hope it's preserved. I believe it's also a satisfying experience for the students," she says.

The students weren't the only heterogeneous group of people at the Media Lab. Some of the teachers had different pedagogical views and methods, which could sometimes result in small clashes of will.

At times, Mäenpää herself was irritated with aspects of demo culture that she saw as introverted. Instead of keeping the end user and her needs in mind, the students sometimes built demos only for themselves. There's value in having a safe environment in which to experiment, but the balance is delicate.

Pekka Koponen, who was involved in the very early years of the Media Lab, would surely agree. He now works at Forum Virium Helsinki, the innovation unit of the City of Helsinki, and has been dealing with the very same themes that also keep the Media Lab busy to this day. Still, he is careful to preface his comments by noting the passing of time and saying he hasn't kept track of the developments at the Lab that closely.

He finds it interesting to see how Aalto University is now trying out multidisciplinary methods and combining technology and design on a large scale — the kinds of things that were uniquely a part of the Lab in the 1990s. In his view, the Lab was a successful inter-disciplinary arrangement, whereas some of the other media labs around the world tend to function more as extensions of their parent departments.

"TAIK was the right environment for the Media Lab because of their design-led approach. Had it been a part of Helsinki University of Technology, the outcome would've been different," Koponen says.

His assessment is based on personal experience, as Koponen was a Computer Science student at HUT from the very beginning in the 1980s — so early that he was one of the founders of Tietokilta, the guild of CS students. His interest in media art and visual arts in general led him to TAIK, where he was eventually hired to help people work with the then-new Macintosh computers, teaching page design and hypermedia.

"I was interested in both sides [arts and computers], and my whole professional life has been straddling the line. Back then the engineers and the designers never met each other at HUT, which now seems really strange. I noticed that TAIK had a hands-on approach that allowed much more freedom in trying out new things," he says.

A detail that speaks volumes about the academic world back then is that Koponen was hired by the Art Education department, teaching future art teachers. They were already trying to come to grips with the change brought on by personal computers, whereas one floor above them was the department of graphic design, where the attitude then was more along the lines of 'using computers only results in bad design.'

When he started out, a lot of the things and the thinking at the Media Lab were unconventional, whereas now he runs into them frequently in his job at Forum Virium.

"The existence of the Media Lab is a direct benefit to us in the sense that a lot of people working for us have studied there. At least in some ways the Lab has met its goal of educating versatile people, who have a handle on new media, on digital media, and combining it with other things. For example right now we're working on services for the public sector and open data," Koponen says.

"THE LAB HAS MET ITS GOAL OF EDUCATING VERSATILE PEOPLE"

He praises the competence of Media Lab graduates, who are quick to learn. They have the skills required to do the kinds of jobs that didn't even exist 20 years ago.

Koponen's comments are echoed by Antti Ikonen's experiences in running cooperative projects with outside clients.

For example, when museums suggest co-productions with the Media Lab, they're often looking for multimodal, interactive creations — not mere audio narratives or promotional videos. It calls for a specific set of design skills, especially if the client isn't entirely familiar with the field or sure of what it is that they actually want.

"That's the kind of know-how we need to impart on our students. It's not enough to arrive at the scene, set up the PA system and make sure there's no feedback. MA students need to see the big picture, create their own projects, and possess the necessary design leadership," Ikonen says.

The importance of cooperation has never been greater. There can still be a lot of friction when experts from different backgrounds come together, as people have trouble understanding others' needs and motives. That is something that the education model of the Media Lab Helsinki can help overcome.

"Even the innovation sector has become siloed in Finland, with people working on small, overlapping details. In the end, Finland is such a small community that it's crucial to think about sharing and working together," Koponen says.

In a way, the models that have long been used at the Media Lab are now being adopted elsewhere. Instead of locked-in proprietary intellectual property rights, companies are opening up and looking at differentiation in other areas.

"It feels like a window of opportunity. Can we establish a more open way of working? What kind of world and society will that result in? What will the professions be like?," he ponders.

The questions are relevant, because there are clear benefits to these new ways of working. For example, it's not always necessary to invest big in order

to get big results. Even a couple of skilled workers can greatly enhance the output of an organization.

The public sector can improve its efficiency by opening up and trying new things, and independent contractors can be excellent sparring partners in this. They need to understand the technical problems, the design problems, and the goals of the users.

There's another aspect in which Forum Virium functions more or less like the Media Lab: learning by doing. Instead of establishing committees for preliminary research and suggestions for follow-ups so that all possibilities of error are exhausted beforehand, they just roll up their sleeves and get their hands dirty.

"We don't do pilot programs that only scratch the surface, we go to work directly," Koponen explains.

It doesn't mean that he would be advocating creating technology demos just for their own sake. The real need is for people who understand technology and service design, and can use their skills to create services that are necessary for improving the quality of life. On the other hand, an intimate knowledge of the limits and possibilities of digital technologies is still essential, if you are to concentrate on what's important.

"THE REAL NEED IS FOR PEOPLE WHO UNDERSTAND TECHNOLOGY AND SERVICE DESIGN"

For example, when facing challenges that could be solved by technological means but still are unsolved, what are the reasons? Are there limits to what the technology can do or haven't the designers managed to come up with a human-oriented solution yet?

Given that technology has progressed tremendously since the 1990s, it's clear that the skills the Lab imparts on the students have also changed. Back then, students needed a different kind of technical competence.

The continuous growth of processing power, the commodification of hardware, and the spread of open software have levelled the playing field. What used to require extremely specialized knowledge might now be already abstracted into a programming library that can be plugged into your project.

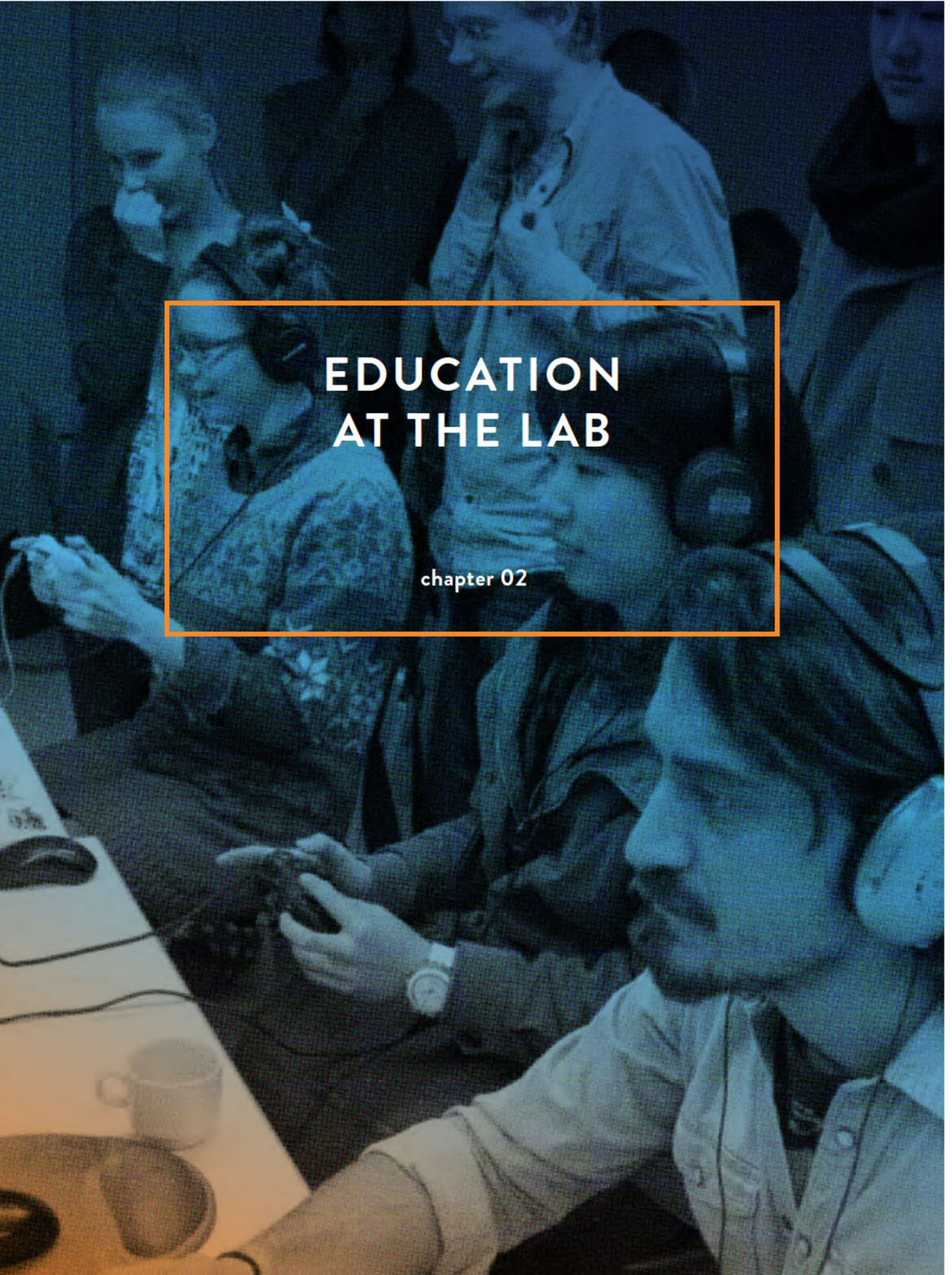
The smartphone you carry with you has magnitudes more processing power than the beige desktop PC had around the turn of the millennium. Even smaller computers with wireless connectivity are becoming so cheap that they can be embedded in pretty much anything.

The advances in technology have made the details of the technological solutions less visible. Digital technology is still a necessary component and enabler for almost everything Koponen works with, but it's almost fading into the background.

"You need a design angle that tells you what to concentrate on, what to spend your time on, and what needs to be done to achieve the goal. Does it require opening data or maybe creating shared tools that the users can actually exploit?", Koponen says.

The questions that need answering aren't related to technological details, but greater themes like: Where do we draw the line at privacy? What should be done in the private sector and what in the public sector? What kind of business models are needed?

This is the role that Koponen thinks the Media Lab can fulfil.



EDUCATION AT THE LAB

chapter 02

The Media Lab's curriculum has traditionally been very flexible, with new courses added if and when the need arose. The apex of this adaptability in teaching — at least from the students' point of view — might be the Open Workshop, a course that has no defined program and consists of free-form meetings where people can work on whatever they like.

"It's made possible by the fact that our students are mature adults. Open workshop was born from the students' suggestion. We tried it out and it's been quite snccessful," Rasmus Vnori explains.

Vnori, who heads the MA in New Media Programme, says that nobody's ever tried to pass the conrse with a clearly pointless project. The conrse is often nsed to develop an idea that was sparked dnring some other conrse. The results are shared with everybody, resulting in a collegial dialogue.

"It's a workshop I always want to organize. It goes to show that with freedom comes responsibility," Vuori says.

He acknowledges the fact that for less determined stndents snch courses can be dannting. Then again the Media Lab only offers an MA programme, meaning the students should have become accnstomed to academic freedom in their BA studies. Besides, if a student continues on to doctoral studies, they'll typically be working in a very independent fashion.

How do you build a curriculum in new media, given that the field is undergoing constant development? The people in charge of the Media Lab came to the conclusion that they needed to concentrate on the principles that would stay relevant.

They developed a curriculum that was relevant but flexible. Built into the curriculum were things that could be changed as the years went by, but also things that wouldn't change: the humanities-related cnltural aspects.

"A CURRICULUM THAT WAS RELEVANT BUT FLEXIBLE"

The intention was to avoid becoming too closely tied to the needs of the bnrgeoning industry. That could have resnlted in a rat race to keep up with the newest gadgets and gizmos instead of building a strong foundation and promoting self-learning skills that would last throughout a stndent's post-Media Lab career.

"It seemed clear to us that tools are going to come and go, and learning to use tools isn't what universities are for," Philip Dean says.

The result was a multidisciplinary masters programme tailored to the strengths and interests of each individual student. Working to a personal study plan is something that the Lab has been doing for 20 years and which has more recently become part of every university's study practice.

"We realized that the only way it's going to work is for people to have their own route, their own profile," Dean says.

Still, getting started posed its own challenges with many pieces being juggled at once. Heidi Tikka, a visual artist who is currently working on her Doctor of Arts studies in the Lab, had to deal with a whirlwind of overlapping demands during her first year as a teacher at the Lab in the late Nineties.

She knew she was going to be teaching students who'd be entering a world that required different skills than the ones they were being taught. That's why she emphasized the importance of a critical practice of reflection and tools that would function as a part of a professional identity.

"We talked about it a lot with the students. A professional has to be able to analyse their work in stages. When you're in production, you have to make quick decisions instead of hemming and hawing," Tikka says.

For a professional, the time of critical reflection comes later on. It includes a systematic breakdown of what they've done during the process and what influences they were drawing on.

It's clear that some of the students wanted to become artists instead of professional designers. Heidi Tikka doesn't think that was the dividing line. Some students had a practical approach: they wanted to learn the skills a professional would need to succeed in the workplace, whereas others needed more contemplation on their future profile as designers-to-be or artists-to-be.

"Some of them wanted more theoretical discussions, wanted to read, wanted to understand things beyond the limits of their own area of expertise," she says.

Sometimes the more straightforward students might back off a bit when faced with the breadth of theoretical thinking behind media design and culture. That was also the reason why she emphasized the importance of knowing the history of the field.

Teaching a multidisciplinary group of students was often a challenge. One of Tikka's methods was to present them with reading materials and suggest ways of approaching the texts. She was under the impression that the method didn't suit all the students, possibly because having such diverse backgrounds meant some of them were unfamiliar with this kind of teaching.

Combining research and artistic practice is an important strategic feature of the Media Lab for both the staff and the students. The two working methods feed off each other, with art enabling the kind of leaps from one idea to another that might be harder in a pure research context. For Heidi Tikka it is a question of methodologies.

"How do we help the students find the key questions in their field, whether it's design, art, or research, and employ them in both practical work and in writing?", she says.

As for herself, she still remembers warmly the people she came across and the intense way in which they worked together during that time.

"The Media Lab was a unique place to be working on things that interest you," she says.

A critical mind set encompasses both source criticism and a humble approach to theoretical backgrounds that you aren't familiar with. The risk in a cross-disciplinary group is that people just pick and choose concepts without necessarily understanding the theoretical baggage they carry.

"This is why a critical mind set is crucial. It's the reason I've emphasized the importance of learnedness, of studying the literature deeper than on a mere surface level," Tikka says.

Mika Tuomola remembers the very first years of the Media Lab as already having the same approach to teaching and research that is still alive today.

"Everybody had a different background, and we ended up educating each other a bit, but the two guiding principles were 'the best way to predict the future is to invent it' and 'demo or die'," Tuomola says.

He is still a true believer.

"The fact of the matter is that whoever comes up with a new design or a new artistic approach to narrative, is changing the future by doing it."

He doesn't expect the students to respect him because of his status as a teacher, but because he has had 20 years to think and read about the matters he's teaching. For example with narrative the starting point is traditional Aristotelian methods, combined with algorithms, the basic building blocks of digital media.

"I hold my students in enormous respect and it's their responsibility to come up with things I can't even think of."

"I HOLD MY STUDENTS IN ENORMOUS RESPECT AND IT'S THEIR RESPONSIBILITY TO COME UP WITH THINGS I CAN'T EVEN THINK OF"

Tuomola believes in the importance of face-to-face contact. Without meeting the other students and the teaching staff, students will miss out on a lot of what makes the Media Lab function. It's an essential part of every art university, and Aalto University's School of Arts, Design and Architecture is no different.

His negative experiences in running one-week workshops abroad is the reason why the seminar he teaches with Rasmus Vuori at the Media Lab is structured quite differently.

"The seminar lasts for half a year and we meet with the students every Friday for two hours. It's an iterative process of analysis, concept, prototype, and a demo that's presented at the Lab's Demoday," Tuomola says.

The students' goal isn't to create industry-ready products during the courses. Failure is accepted, because trying is the important thing — doing and then reflecting on the process. Tuomola tells his students that their classwork isn't assessed based on how well it's been polished, but rather on how daring it is.

"If you have an ambitious goal that you examine closely and reflect upon, you can get a good grade, even if the end result is a flop," he says.

It's an attitude he'd like to instil in the students on a wider scale. During economic boom times, many of them are recruited before they manage to finish their degrees, which Tuomola thinks is a shame. In professional life, there isn't a lot of time to try things out.

To grow as a creator, you have to have had the possibility to try and fail. This makes you more systematic and professional, and helps you steer clear

of obvious traps. The university is a safe environment for experimenting without the pressures of the business world, where you don't have a lot of time to think about problems before you have to solve them.

"Your selection of tools will be limited unless you've had time to try them out," Tuomola says.

"TO GROW AS A CREATOR, YOU HAVE TO HAVE HAD THE POSSIBILITY TO TRY AND FAIL"

The fact that some students take longer to graduate can be a possibility, not a threat. Current educational policy doesn't, however, support the idea of extended studies. As Rasmus Vuori remarks, "spending more time on studies results in better quality results."

In 1998 the Media Lab had proved its mission and was given faculty status within TAIK. This led to the creation of a more formal academic staffing structure. In 2001 the Lab hired three new lecturers: Antti Ikonen, Rasmus Vuori, and Kai Lappalainen. Each had had a specific domain – sound, multimedia and animation respectively.

In a few years, Ikonen would be heading an entirely new master's programme, Sound in New Media, launched at the lab in 2008. It had started as a minor subject in collaboration with the Centre for Music and Technology at Sibelius Academy in 2005.

The first time Antti Ikonen made contact with the Media Lab was in 1995 when the Lab planned to establish a part-time studio assistant job — something of a mix between a teacher and a jack-of-all-trades. He started teaching at the Lab a few years later.

Back then the role of audio was something that today might be relegated to a polytechnic: editing sound files, burning CDs and so on. It was an understandable approach at that time, but Ikonen found it unsatisfying.

He felt the teaching had to go deeper, starting from the basics of auditory perception, through into theory of sound, history of music and genre thinking — amongst other things.

So Ikonen decided to realise it through involvement in planning the curriculum.

"People had a burning passion for their subject and a lot of pioneering spirit. Philip Dean was barely 40 and he was the oldest person on staff," he says.

One of the first things Ikonen did was to rebuild the students' introductory course. He'd been teaching for nearly a decade in different places and felt the Media Lab was a place where he could put his ideas about pedagogy into action.

Sound in new media is a relatively recent arrival even on a global scale. It's not theatre sound design or film sound design, so the Media Lab doesn't train composers or musicians, but something completely different.

When Antti Ikonen benchmarked the schools that provide a degree in new media sound design in 2006, he found out he was the only full-time teacher of the subject in Europe. There were various one-off courses in many new media and digital media schools, but no teachers. The discovery astounded him.

In his first draft of the curriculum, Ikonen argued that Finnish game design was going to have a phase of explosive growth in the near future. (This was before the days of Angry Birds).

"Later on I've been waving that document around saying, 'I told you so'," he says with a smile.

Since the launch of the programme, the number of applicants has doubled and people from over a dozen countries applied to it in 2013. Ikonen sees that as proof of a positive response to the Media Lab way of doing things.

"I've always felt I have full support, even when funding hasn't always been available. The atmosphere inspires and motivates me to improve the teaching in my area," he says.

There's been many routes to ending up as a teacher at the Lab. Rasmus Vuori is a good example of this. He found his way to the Lab by an improbable route, but it makes perfect sense.

In the 1980s he hung around on BBSes, the pre-internet version of online discussion forums. He had no clear sense of direction, but recalls chatting about his future plans of applying to the University of Art and Design together with Aleksi Bardy, he laughs.

"Time has flown by. Aleksi is a professor of film and TV production at Aalto, and I'm here at the Lab, but things didn't necessarily go exactly according to plan," Vuori says.

After high school he studied 'a bit of quantum physics' because you couldn't enter the MA program at the Media Lab directly from high school.

He ended up working at Science Center Heureka, where he met Erkki Kurenniemi, Finnish pioneer of new media, who was the head of planning there between 1987–1998.

Vuori got interested in media art step by step. First he worked as a guide at Heureka, then started working on the networking systems. In 1994 he applied to the Media Lab, but it took until 1996 until he started his studies there.

He didn't have a BA, so he needed to pick up some work experience. Applying for a study place on the basis of work experience was also a possible route into TaiK's programs.

"Few people took advantage of it," Vuori says.

A teacher of new media has to adopt a humble attitude, as Vuori points out. Since Media Lab Helsinki has only Master of Arts and Doctor of Arts programmes, every student entering the department already has some experience, either academic or practical. The process through which learning at the Lab is realized is based on facilitating the students to enquire and build knowledge together.

It also means that life-long learning is not a mere slogan. In order to be able to teach each successive class, the teachers have to keep updating their knowledge, perhaps much faster than in many other, more traditional fields.

Vuori describes the teaching process as a dialogue, but not just between the teacher and the students. As the students come from varying backgrounds, disseminating that knowledge among the group is a key aspect.

"Generally it's thought that this is a place where the students can take responsibility for their own learning process. It's our task to provide the prerequisites for the students to build on their strengths. It isn't necessarily our responsibility to tell the students what to learn, but rather to help them assess their skills and help them work on the perceived missing parts," Vuori says.

"THE TEACHERS HAVE TO KEEP UPDATING THEIR KNOWLEDGE, PERHAPS MUCH FASTER THAN IN MANY OTHER, MORE TRADITIONAL FIELDS"

This method is partly a function of the new media environment. Loads of information, documentation, and tools are widely available. That's not

the problem. The problem is understanding how to filter all this data, in realizing what to emphasize, how to develop meta-learning skills, and how to keep everything up to date.

"It's a cornerstone of teaching. The teacher is a sparring partner, not a 'lecturer.' Obviously we have lectures too, but that's a small proportion of all teaching," he says.

The other side of dealing with constant change is the necessity to be willing to constantly let go of things you've learned previously.

"This is a tricky thing. You've become very skilled in something that's become obsolete. Being a veteran in new media and having experience gives you an advantage, but it can be treacherous if you're not good at shedding your skin," says Nuno Correia, a post-doc researcher and lecturer at the Lab.

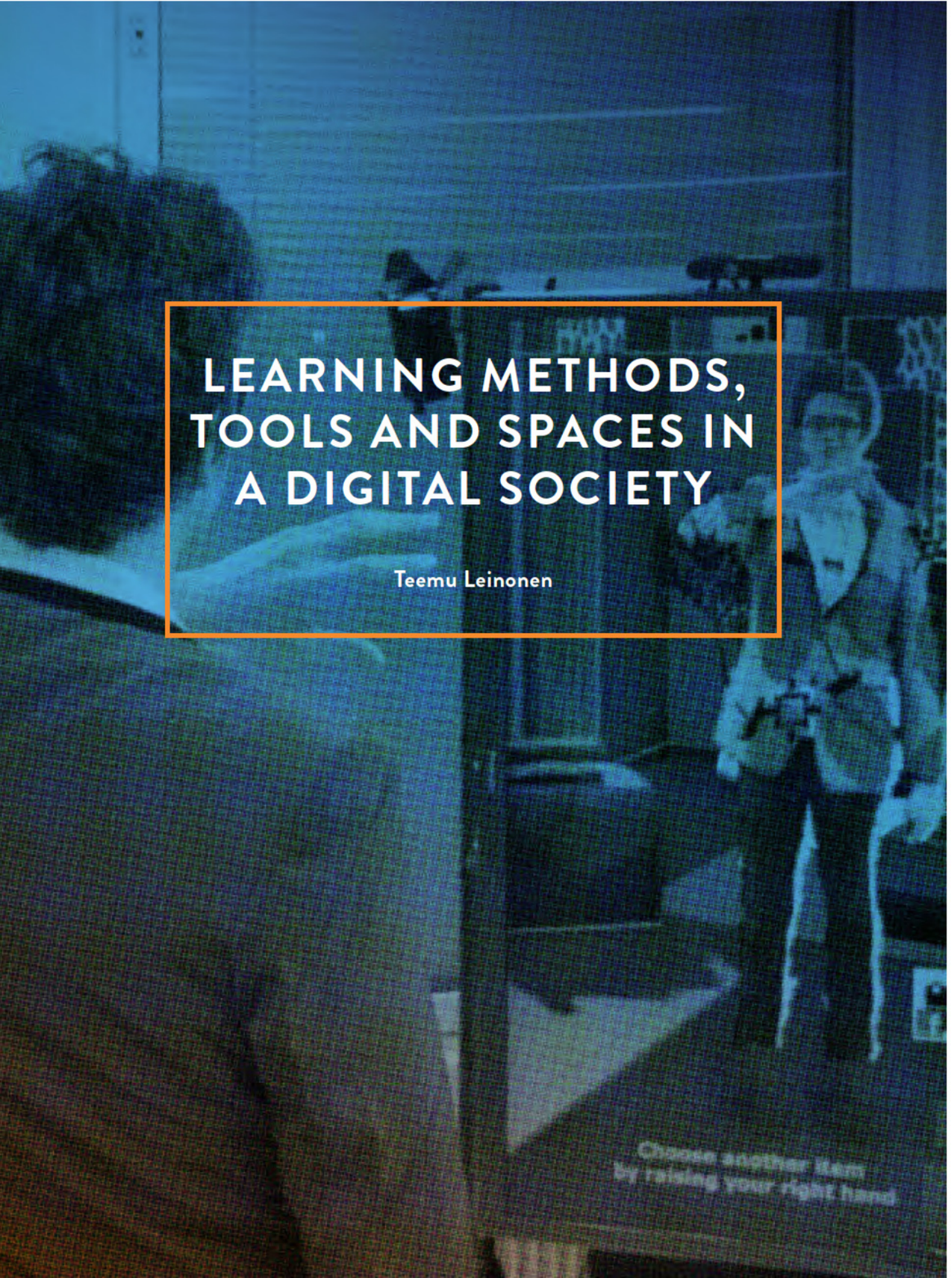
It's the sunken cost fallacy and it's easy to understand, because we humans have a tendency to overrate our possessions, be they material or immaterial. If you spend hours, days, and weeks perfecting your skills with a technology that then drops out of use, adapting to the new situation will probably feel painful even if you're perfectly capable of handling it.

Correia has an elegant way of putting it: "You're shedding particulars, not the essentials."

It's also the reason the Media Lab doesn't try to teach the students to use only certain programs or programming languages, but rather infuse them with more generic knowledge that'll stay applicable for a long time to come. After all, the technical details can, and will, change.

What the students should pick up is the capacity to learn, to learn to find the essentials within different bodies of knowledge and to get rid of what they don't need anymore. In Correia's view, these are the core new media skills — in addition to finding your individual voice, methods and values.

That kind of competence will never grow stale.



LEARNING METHODS, TOOLS AND SPACES IN A DIGITAL SOCIETY

Teemu Leinonen

Designing learning environments — methods, tools and spaces for good learning — have been one of the cornerstones of the Media Lab Helsinki since it was founded in the early 1990s. Within the emergence of new computational tools, digital media and networks it was seen that these would radically change the educational landscape of our time. In the Media Lab we decided to have an active role in the process where the future of education is designed.

In the Media Lab the approach has been to enable meta-design: to have activities that create new methods, tools and environments that allow people to be creative and act as designers[1]. The idea constitutes a deeper pedagogical principle, too. Learning is not primarily about receiving information and gaining skills but rather a process of participation to practices of an expert community.

"LEARNING IS NOT PRIMARILY ABOUT RECEIVING INFORMATION AND GAINING SKILLS"

From the early days the pedagogy of the Media Lab was snmmarized with the statement "hands-on with minds-on". Finding balance between the "jnst do it" attitude and serious considerations of the consequences of the doings is still central in the Media Lab.

In the last 20 years we have seen several stages in the history of mainstream development of compnter-based learning tools[2]. I have recognized five stages of paradigms of the use of computers in learning. From those, the Media Lab has been influenced by all of them and actively involved in the three latest stages. Althongh we have been living with these trends the focus in the Media Lab has been on the latest stage ie. social software + free and open content, since the lab's early years. We may proudly say that, in this matter, we have seen and made the fntnre.

Today, in the field of design research of New Media for learning, within the Learning Environments research group of the Media Lab, we recognize and focus on three topics that are essential parts of the social software + free and open content paradigm. These are New Media enhanced methods, tools and spaces for, (1) knowledge building, (2) reflection, and for (3) design and creativity.

In the following, I will present these from theoretical and pedagogical points of view and then present some idea as to how New Media can be

[1] Fischer, G., & Scharff, E. (2000). Meta-design: design for designers. In Proceedings of the 3rd conference on Designing interactive systems: processes, practices, methods, and techniques (pp. 396–405).

[2] Leinonen, T. (2010). Designing learning tools. Methodological insights. Aalto University.

used within them. If you are interested in the prototypes designed in the research group, in order to experiment in these areas, you may point your browser to the URL's listed in the end of the article.

Methods, tools and spaces for knowledge building

We have a long history in knowledge building research. The Learning Environments research group was found in 1998 on the basis of the Future Learning Environment research project carried out with the Centre for Research on Networked Learning and Knowledge Building at the University of Helsinki. Since then, the theoretical framework of the research has stayed the same, although we have also witnessed its remarkable development.

The central concepts of knowledge building research are social constructivist learning theory, Vygotsky's[3] theory of the zone of proximal development, knowledge building theory[4] and progressive inquiry learning[5].

The pedagogical framework can be summarized to be an attempt to facilitate a similar kind of working practice with knowledge to that which are common among expert communities, such as scientific, or art and design communities. In knowledge building people are engaged in working together to create knowledge. In computer science, some of the earliest experiments in computer supported collaborative work (CSCW), had very similar objectives.

Especially Douglas Engelbart's 1968 demo of the oN-Line System (NLS), designed for collaborative knowledge work, can be identified as the first attempt to design a computer system for knowledge building[6].

Using New Media in knowledge building is a widely studied topic. There is still, however, a lot of work needed in this field. It is not a trivial design research challenge to design and development knowledge building tools that will truly support progressive discourses which are able to guide students to deepen their understanding collaboratively and that will help them to self regulate their activities, as well as to follow and take different views to the process. With several prototypes (Fle3[7], Fle4[8]) and experiments with them, we have contributed to this research tradition.

[3] Vygotsky, L. S. (1978). Mind in Society: Development of Higher Psychological Processes (14th ed.). Harvard University Press.

[4] Scardamalia, M., & Bereiter, C. (1993). Computer Support for Knowledge-Building Communities. The Journal of the Learning Sciences, 3(3), 265–283.

[5] Hakkarainen, K. (2003). Emergence of Progressive-Inquiry Culture in Computer-Supported Collaborative Learning. Learning Environments Research, 6(2), 199–220.

There are also topics I would like to explore in the future that share some connections to knowledge building theory. These are rich media (audio-video) tools in a knowledge building processes, as well as dialogue and discourse tools specifically designed for organizational strategy work, for conflict meditation and to support deliberative democracy.

Methods, tools and spaces for reflection

According to the dictionary reflection means "serious thought or consideration". Thinking, and thinking about ones own thinking are common methods used for better learning. In formal education, reflection is often a process, in which individuals write texts, such as lecture notes, journals and essays.

Reflection is important in knowledge building, too. Knowledge building can encourage participants to guide and regulate their own learning: to think and decide on what is important to find out, what to do next and how to do it. The process asks people to take responsibility for their learning. In this the participants need both self- and group reflection.

To experiment with the possibilities for using New Media to enhance reflection we have designed several prototypes (ReFlex[9], TeamUp[10], Ach So![11]). The tools are expected to help teachers and their students to create spaces for reflection, to make their classroom a learning environment where reflection is an essential part of all activities. When brought into the classroom the tools formulate a new kind of interaction between the students and teachers, as well as among the students themselves. The tools also support transparency and sharing culture in the classroom or in the workplace.

Methods, tools and spaces for design and creativity

The third area of research in the field of New Media and learning we have worked lately is the use of the tools in design and creativity. In this arena we focus on the essence of New Media, the possibility to program, to code things that will serve you. We see that programming, the ability to com-

[6] Engelbart, D. C., & English, W. K. (1968). A research center for augmenting human intellect. In Proceedings of the December 9–11, fall joint computer conference.

[7] http://fle3.uiah.fi

[8] http://fle4.aalto.fi

[9] http://reflex.aalto.fi

[10] http://teamup.aalto.fi

[11] http://achso.aalto.fi

mand a computer to do things for you, is at the core of New Media and has a great impact on creative practices.

We call the ability to think and interact with computers a computational thinking skill. In practice it means that when doing stuff — designing and creating new things — students are able to recognize situations where a computer can help them to achieve their goal but also situations when computers are not useful.

As the research group's senior researcher Tarmo Toikkanen has proposed that programming, in its essence, is simultaneously both maths and art: problem solving, logical thinking and creative expression. In the digital society coding is as important a skill as farming used to be in the agrarian society or as technical drawing was in industrial society.

As design researchers we are interested in designing and developing prototypes (Square1[12], Meemoo[13]) that will provide computational thinking, programming and coding for others. Additionally this area of research has a long history to build on. In our case we have been interested in hardware and related meta-design aspects. Concrete hardware components can demystify computer technology and, when built to be hackable, can provide possibilities for students to take full ownership of the tools used.

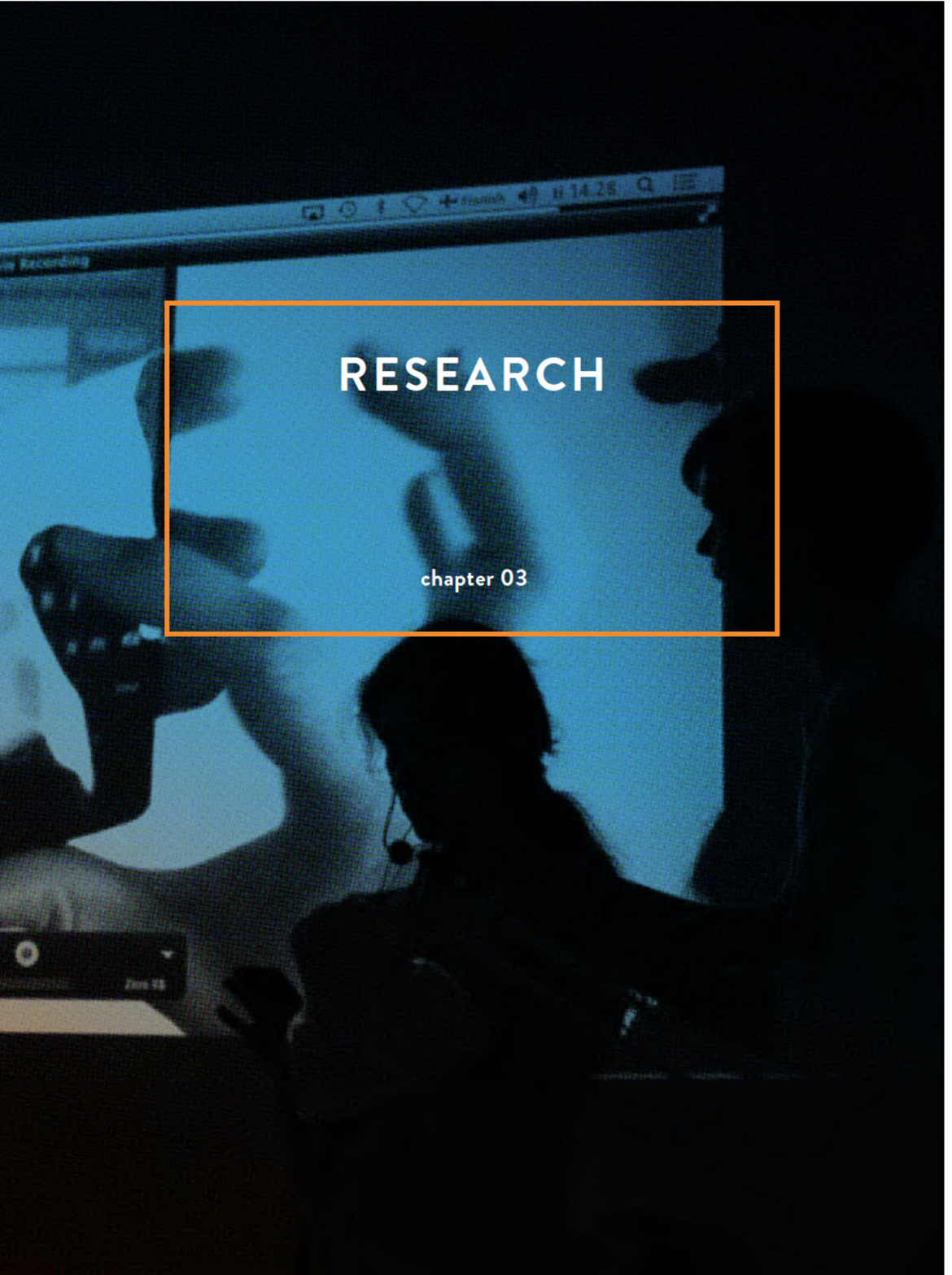
A diversity of ideas and working practices is good for learning. Students should experience new discoveries and inventions everyday. For this to happen we need intellectually rich environments; different people with different ideas. Within the Media Lab we should ask everyday how we could be a more sophisticated community of scholars, designers and artists — all exploring new frontiers.

"WE NEED INTELLECTUALLY RICH ENVIRONMENTS; DIFFERENT PEOPLE WITH DIFFERENT IDEAS"

Continuously revising and developing our methods, our tools and spaces for better learning are ways to keep the Media Lab relevant. Building on what we already know, but also providing possibilities for meta-design are critical. We believe that these are the philosophical, pedagogical and research methodological approaches that will create a digital society that is fair and sustainable.

[12] http://lead.aalto.fi/tag/square1

[13] http://meemoo.org



RESEARCH

chapter 03

Over the span of two decades, the various research groups at the Media Lab have covered a wide variety of topics utilizing a wide spectrum of methods.

The Arki research group, for example, was founded in 1997 nnder the name, Future Media Home. The group's early work involved several dozen students from varions nniversities who met at the Media Lab for a workshop and then spun off to work individually. The project gave birth to several master's theses.

"[Future Media Home] was a fun production and an example of the kinds of things yon can do at the Media Lab. And something we [at Arki] wanted to keep doing in the future," Kari-Hans Kommonen says.

Research at Arki concentrates on the ways digital media technology and everyday life are evolving together. Their work is a demonstration of how much technology has changed in the intervening years. In the early years, the gronp had to find a way of dealing with a fntnre that was uncertain. A method they ended up using was termed, design fiction.

"DESIGN FICTION GOES A STEP FURTHER"

Everybody's heard of science fiction, but design fiction might be a more foreign concept. Think of it this way: science fiction stories are often allegories, dealing with the results of a particular set of technological advances — worldwide data networks, Artificial Intelligence, interstellar travel, and so on.

Design fiction nses the tools of fiction and rigorously applies them to a fnture with similar technological parameters to see what kinds of design people might be using then. For example, what happens after mobile computing devices become pervasive?

If the traditional way of presenting future scenarios consists of bullet points and mood boards, design fiction goes a step further and tries to add a sprinkling of verisimilitude.

The Learning Environments for Progressive Inquiry Research Group, or LeGroup as it's known, focuses on the meeting point of new media and education.

The gronp's FLE project, the Fnture Leaning Environment project undertaken in 1998, designed and developed a web-based collaboration platform. The Centre for Research on Networked Learning and Knowledge Building at the University of Helsinki were partners in the project.

"It was a reaction to the hype surrounding e-learning, which we thought was completely misguided. [The trend was] to be more efficient, faster, and cope with more students. This emphasized the efficiency and forgot about the perspective of using computers to increase the quality of learning," research group leader, Teemu Leinonen states.

The idea was to create a system that supported progressive inquiry by facilitated online conversations — to pose questions, present a hypothesis, research the subject and argue it. The great thing is that people can construct knowledge and produce content themselves. Interactivity doesn't mean just clicking on buttons, but engaging in a dialogue with other people.

"It's dominated much of my work since then. I sometimes feel like I'm still continuing with that work but in a slightly different way. The philosophical stance has stayed the same. It's not about the media you consume, but the media you produce," Leinonen says.

Leinonen is almost embarrassed by the simplicity of the idea, but there's still clearly a need for it. What happened in 1980s with educational video and 1990s with educational CD-ROMs, is now happening, yet again, with tablets. The medium is still viewed as a unidirectional system of depositing information onto the recipient, maybe with a sprinkling of gamification on top.

The pedagogical ideas Leinonen still champions were derived from Canada in the 1990s. What began as a way of teaching IT to schoolchildren morphed into a more widely applicable theory of learning. The arrival of the World Wide Web added a new twist to the story.

"The web enabled searching for scientific knowledge and not only that, but sharing the information with others," Leinonen says.

Some of the research done at the Media Lab can appear nebulous. Antti Ikonen, head of the MA in Sound in New Media, remembers that when he started working at the Lab, he sometimes had difficulty understanding the research being done there.

"It was along the lines of, 'could a thing like this exist and what would happen if it did?'," Ikonen describes.

To understand the research, it probably helps to understand how the researchers found their calling. For example, how do you make a programmer out of a dramaturg?

Mika Tuomola began his studies as one of the first intake of students in 1994. He'd already been working as an assistant to the theatre director Jotaarkka Pennanen who had a company called Interactive Film Productions.

Tuomola was a fan of Pennanen's work and when he started working for him, Tuomola had to learn to program in HyperCard, which was a simple but powerful piece of multi-media software. Using a computer program was necessary to burrow into nonlinear interactive storytelling.

"I think I talked about this when I was being interviewed to study in the MA program. I was certain I wanted to study narrative in new media, to find out if a narrative could be constructed in a narrative space that you navigate in, instead of being time-based with a beginning, a middle and an end," Tuomola says.

He dreamt about building a narrative that would work like the Glass Bead Game in Herman Hesse's novel of the same name, a complex interconnected system of music, maths, arts, and physics, where moving one part would have an effect on the others. In other words, he was interested in not closing the story.

Tuomola doesn't wish to add interactive storytelling into all stories, on the contrary. The narrative itself must be built upon the concept of choice — in the existential sense — which then legitimizes the interaction.

"You are what you choose and your actions define the world and ethics. These kinds of worlds where you can see the results of your choices in a simulation and then change your point of view are the ones where interactive storytelling can really shine. When the content starts to find a form, you don't force it into a movie or an interactive narrative, if it doesn't have the necessary ingredients," Tuomola remarks.

The mission of Crucible Studio, established in 2001, is to explore new modes of storytelling by combining new media and keeping in touch with the long tradition of drama.

One example of their work is a research project entitled NM2 — New Media for a New Millennium, which Tuomola worked on between 2004 and 2007; a huge inter-disciplinary EU-funded R&D project that researched software tools for generating personalized audiovisual content, including real-time interactive TV shows.

A big part of that was the TV show 'Accidental Lovers' (Sydän kierroksella) that Tuomola wrote, directed, and designed the concept for.

"It was a laborious project that kept us working long days. I was the artistic research leader of the research group and director of the series," Tuomola says.

The intense work made a mark for both good and bad. The good part was that with over 80 people taking part in it, it's still the biggest research project Tuomola has been involved with.

"The spirit of collaboration was great and the team really fused together," he says.

On the downside the constant demands meant that when the show was finally complete, Tuomola suffered a breakdown. Now he can laugh about it.

"I had to take sick leave for a month. Some projects are like that. They take a lot, but they also give a lot," he says.

The research project didn't spring out of nothing. In the early 2000s, companies were already publishing linear audiovisual productions online, but interactivity was still something of an unknown entity.

Tuomola had been researching generative cinema, meaning a system of rules that could take a bunch of audiovisual clips and splice them together in different ways so that the end result would still feel like a movie that was edited by a human. This, so-called, probabilistic editing system was programmed by Markus Norrena, who is also a graduate of the Media Lab Helsinki and a "philosopher-computer scientist," as Tuomola describes him.

Leena Saarinen, a colleague of Tuomola's at the Media Lab, had written her master's thesis on artificial personalities entitled chatbots, programs that could convincingly discuss with people. Merging Saarinen's work with the generative editing program resulted in a concept called Accidental Lovers, where real people could interact with artificial people through the medium of moving images.

They entered a pitching contest at Banff World Media Festival — then known as Banff World Television Festival — and won a prize of 10,000 Canadian dollars. One thing led to another and Accidental Lovers became a pilot project in the NM2 research program.

It became clear to Lily Díaz very early on that, if she wanted to keep researching the things she was interested in, she would have to build her own career and her own tools. That never deterred her and nowadays she leads the Systems of Representation Research Group at the Lab. The research group uses new media to make heritage-related knowledge more concrete.

"Now there are a lot of people involved in the kind of work that I do, but when I started doing it, there were maybe one or two people in the world, and none in the arts," she recalls.

Because digital humanities didn't really exist, it had to be invented. Now the field is growing with new doctors graduating constantly, and eventually it'll truly turn into a discipline of its own. Díaz compares it to the development of neurosciences and its offspring.

"In the same way as 20 years ago there was no such thing as neuroaesthetics. Cognitive sciences were beginning to form and they were very different from what they are now. Cognitive science actually existed in psychology as a very limited, experimental area of looking into the way the human mind operates, but now it's its own area," she explains.

"BECAUSE DIGITAL HUMANITIES DIDN'T REALLY EXIST, IT HAD TO BE INVENTED"

The necessity of going her own way was something she realized early on, because the one computer art programme she found was at MIT and was aimed at engineers. Díaz graduated from the School of Visual Arts (SVA), New York, in 1989, from the second class of their computer art program.

It's an understatement to say that The Finnish Pavilion at the 1900 World Fair means a lot to Lily Díaz. Almost every history book she's read about Finnish art mentions the pavilion, but when she talked to people, they were rarely aware of it. This surprised her, as she'd thought that such forgetfulness only happened in America.

The Systems of Representation research group, in collaboration with the University of Applied Sciences, Metropolia, reconstructed the pavilion as a three-dimensional computer model with spatial sound. The pavilion can be viewed both from inside and outside. The first phase of the reconstruction was funded by a Tekes-funded project that researched new ways of interacting with virtual reality.

It's not just any model. The undertaking was complicated not only because of the scale and the multimodality, but because much of the art displayed at the pavilion was later destroyed.

"It's a fantastic project, because of how complicated it is, because it brings together the issues of ethnic and national identity, nationalism with the good and the bad... and of course art," Díaz says.

The virtual pavilion is a thoroughly designed experience, not just a document to be examined from afar. She herself can attest to the difference and the way it brings the creators of the pavilion alive.

When Díaz first came to Finland, her first research project dealt with Finnish culture. She started to learn about the history, but it was a tremendous amount of knowledge to tackle, especially with a language barrier.

"I'd read about the people, I went to the museums, and visited almost every gallery in Helsinki and Turku. I knew about these people, but not until I met them through the pavilion did I start to understand how important it was to them that Finland would become an independent nation."

This is what the pavilion really managed to impart on Díaz; the Finnish artists of the turn of the 20th century weren't just creating art for art's sake, but trying to change the world.

"They had the nerve to think that with their little art they were going to make a difference."

Some of the items displayed in the pavilion were guerrilla art avant la lettre, like the Finnish passport that was obviously a politically volatile concept during the Russian reign. It was also an experiment in mythmaking.

Even the Finns who built the pavilion seemed like exhibition items to Parisians. Carpenters from the Ostrobothnia region constructed the building to look like it was made out of stone, even though it was built of wood.

All these details and connotations are made so much more vibrant in the virtual reconstruction.

"The more I get into it, the more there is to do," Díaz says.

New media has brought many new possibilities to art. Díaz is excited by the prospect of thinking up completely new ways of making art and realising them. However, sometimes the end result can feel almost anticlimactic, because the sense of ground-breaking novelty soon dissolves.

She has been centrally involved with creating the digital facsimile of the map of Mexico 1550. The complex project started in 1996 and resulted in much more than a simple digitized photograph or a scan. When it was ready, the feeling was overwhelming.

"It was a hell of a lot of work, but so rewarding. I waited two years to see what it would be. At the time it was state of the art, now it's prosaic," Díaz says.

She brings up the digitized models of the Finnish pavilion and Vrouw Maria. To experience these very accurate models that represent sites that have previously been either completely or practically inaccessible, is to feel the presence of an aura that combines the original object and the new digital model.

"The model is not the same thing as the simulation, but to me it proves the power of digital media. Once you have a properly made model, it's possible to start to create a whole bunch of different representations, each with their own different kind of experience."

"To me that hints at the power of digital media. What Alan Kay was saying: it's protean, it has multiple faces, it can assume multiple disguises or multiple manifestations," Díaz says.

You can sometimes hear academics complain about how teaching eats away the time that could be used for research. But for Nuno Correia, it's a tangible reminder to keep up with the latest developments in his field.

"IT'S NOT JUST ABOUT PASSING INFORMATION ONTO THE STUDENTS. BECAUSE TEACHING IS COMMUNICATION AND COMMUNICATION IS A TWO-WAY PROCESS"

"Because when I go to a class, I'll have around 15 very demanding students, very demanding customers there," he says.

It's not just about passing information onto the students. Because teaching is communication and communication is a two-way process, the interaction with students can offer valuable insights. It happens daily. In his view, the more flexible the teaching environment is, the more students can learn from each other.

"One of the roles of the teacher is to facilitate that. I don't think it's possible to be a good teacher, if you close that avenue down. We have a huge diversity of students, many of whom are accomplished in their own area, so you have to tap into that and use their expertise in your teaching as well," Correia says.

Many of the doctoral theses completed at the Media Lab deal with creative practices. The works are rarely purely theoretical, because the doctoral degree programme offers the possibility for candidates to include a production as a part of their research. These can be experiments or prototypes. It helps to keep the research on a practical level.

"I believe it produces people who have a very high level of understanding in the practice of new media. They understand the interdisciplinary basis of what they're doing, they understand the issues of developing something new," Philip Dean says.

At first it might seem like building prototypes is a way of turning your back on theoretical skills, but it's actually the opposite. Putting your research into practice develops self-analytical skills, and helps people to professionally analyse their own creative processes and the uses and reception of their creations.

"It enables the development of the field, and because of the practical links, it makes it much easier for the candidates to produce teaching that is relevant. It all feeds back into the Lab's ecosystem," Dean says.

There are several examples of this, such as Koray Tahiroğlu's Sound and Physical Interaction (SOPI) research group. It's a demonstration of the lack of barriers between research and teaching.

The feedback from research to teaching was something Tahiroğlu insisted on from the start, and not only in the MA programme but in doctoral studies as well. He credits Philip Dean and Lily Díaz with making the SOPI group a part of the Media Lab's strategy. It's one of the latest additions to the Lab's research community.

"THE FEEDBACK FROM RESEARCH TO TEACHING WAS SOMETHING TAHIROĞLU INSISTED ON FROM THE START"

Antti Ikonen says Tahiroğlu's talent and work ethic were obvious from the onset. Tahiroğlu's post-doc career was funded by the Finnish Aca3demy and Aalto University and his research, along with that of the lab's other research groups, was ranked very highly by the university's first-ever research assessment.

"That felt like a well-earned victory, because the Media Lab's research wasn't always understood," Ikonen says.

He too praises the seamless cooperation between research and education that's happening in the SOPI research group. Ikonen thinks the ever-vexing question of splitting time between research and teaching is mostly one of attitude. It's not a one-way street, as the research group recruits students who are working on their theses to work as research assistants. This has created a positive snowball effect, where the research group takes care of its own funding and contributes to teaching.

"Part of what we do in SOPI is look at the role of sound in our interaction with objects. I think the interaction part is really important," Tahiroğlu says.

He is convinced that we lost something tangible when digital interfaces took over. To fight this, he has done experiments where touch interfaces, like the ones found on all smartphones and tablets, are enhanced by sound.

"If the physicality doesn't exist, we try to fake it, simulate it, create an illusion of physicality," he says.

For example, the SOPI research group found that if touching a different place of a touch screen was accompanied by a different kind of sound effect, the users would report feeling like they'd touched a different kind of surface.

If you think about how easy it was to dial numbers on a phone with a physical keyboard without looking at it, and how utterly hopeless it is on a touch-controlled phone, you quickly begin to see the possible uses of this research. Still, a philosophical design question persists.

"Why do we need to create this illusion? Why not create an interface that can create this physicality by itself?", Tahiroğlu asks.

He sees the group's work as relating closely to human-computer interaction and extending it with the possibilities of audio. For a long time, audio was window dressing, with many sound cues being used in a purely aesthetic way. Now the situation is changing.

"Earlier the role of audio was to be elevator music, to keep you entertained. Now when you get into an elevator, the audio provides information so that you don't need to look at the display," Tahiroğlu explains.

According to Koray Tahiroğlu the dissemination of information is more straightforward in fields other than new media. Publishing papers in academic journals is one thing, progressing towards a future vision through artistic research something else.

Tahiroğlu says he became acutely aware of the difference when working on his doctor of arts degree (DA). He created several interactive music systems and presented them at conferences and festivals. Turning that into journal papers was challenging, though not impossible.

"Usually we build a version, present it, look at the upsides and downsides, and iterate on it. There's no reason why journal dissemination couldn't be there too," he says.

The SOPI research group he now leads is dealing with interfaces that don't yet exist. The group doesn't aim at creating commercial products. Instead it produces prototypes that can be tried out and explored further.

"AHNE TURNS A ROOM INTO A MUSICAL INSTRUMENT"

One example of a prototype they built is AHNE, an Audio-Haptic Navigation Environment. Basically it turns a room into a musical instrument of sorts: the user can manipulate different sounds by grabbing them — that's the haptic part — and moving them to a new location. It's all done by a motion-tracking Kinect sensor and free software.

Tahiroğlu envisions a DJ tool built on the same principles, where the performer wouldn't be insulated from the audience behind a stack of audio hardware.

"We focus on bodily interaction. We don't want to sit behind our keyboards, we want to move," Tahiroğlu says.

"People like to say that there isn't a technology that can do this, but there is. And it comes from providing a future vision, that the technology then follows."

Perttu Hämäläinen was appointed to his position as professor of Game Design in early 2012. His position and the related work and results are shared jointly between the Media Lab and the department of Media Technology at the Aalto University School of Science. As part of this work he leads a research group, which has been concentrating on the development of interactive, physical gaming technologies.

Hämäläinen has a pragmatic approach to his research, so one distinction he doesn't pay too much attention to is the question of 'is this art?. Different forums have different values, which helps maintain diversity, a value in itself. What seem to interest him most are the results.

"If someone doesn't want to play by the rules of the corporate world, they can advance their career by holding exhibitions. It doesn't matter whether you've had good exhibitions, won design competitions or had a paper published in a prestigious journal. They all help in applying for grants and progressing," he says.

Hämäläinen has his own reasons for valuing media art: "I haven't been attending Pixelache in recent years, but when I started, it gave my career a real boost," he says.

The Helsinki-based Pixelache festival has been a regular forum for Media Lab's artists and researchers since it was created in 2002. Hämäläinen says his game Kick Ass Kung-Fu wouldn't exist if Pixelache hadn't accepted his one-page proposal.

Pixelache Helsinki bills itself as a 'transdisciplinary platform for experimental art, design, research and activism', and it was the place where, in 2005, Hämäläinen demonstrated the immersive game installation, called Kick Ass Kung-Fu, in which the player controls the game character through his or her own movements, which are tracked by a web camera.

"Having to present the game to an audience gave the project a boost and then led to all kinds of things," he says.

Hämäläinen sees the field of media art functioning as a laboratory, where it's cheap to try out new ideas, and the ideas might turn into a business or research — or in this case, both. The project resulted in two commercially released games: Kung-Fu Live in 2010 for the PlayStation 3 and Kung-Fu High Impact in 2011 for Xbox 360, published by Impact Games.

Before the kung-fu games there was QuiQui's Giant Bounce, which was co-created by Hämäläinen and his student colleague Johanna Kronholm (née Höysniemi).

QuiQui's was a part of his MA thesis when he graduated from the Lab in 2001 and it later featured in his doctoral thesis, too. The game was an early example of embodied gaming and it won awards at the Finnish Mindtrek Conference in 2001 and the Milia New Talent Competition, Cannes, France in 2002 and was later exhibited in the Ars Electronica Centre, Linz, Austria in 2006–2007.

"Those must've been the first awards I'd ever won for anything," Hämäläinen says.

All the aforementioned games are examples of embodied user interfaces — or to put it simply, controlling computers by moving your body. They've been the focus of much of Hämäläinen's research and work both inside and outside academia. He was drawn to it by the allure of working on a brand new, unexplored subject.

He had good luck with timing, because he ended up working with technologies that made a breakthrough around the turn of the new millennium, just when the increased performance of computers made real-time computer vision possible.

The possibilities afforded by new technologies were combined with Hämäläinen's interest in the feedback link between our bodies and our minds. For a long time, he tried out various sports. It took a long time to find something that held his interest. Sports intrigued him, because there was an almost aesthetic component to the way exercise felt. This led him to study the subject further.

"We express ourselves through our body. So if we control our embodied expression through an interactive experience like an embodied game, it also has an effect on the emotional and aesthetic experience," Hämäläinen explains.

Noticing the changes in his own behaviour and body are a strong motivator. The concept of embodied gaming can also be linked to public health.

"I want to fight the idea that the spread of computers leads to a life of sitting down. It doesn't have to be like that," he says.

Right now his research group is working on an augmented climbing wall, which uses motion tracking to help the climber choose smarter climbing strategies.

"I'm a beginner in this, but our post-doc researcher is an active climber. Whenever he shows a better way of choosing a route, it's an eye-opening experience, 'Ah, it wasn't that hard!. So now we're trying to see if artificial intelligence can do the same," Hämäläinen says.

"I WANT TO FIGHT THE IDEA THAT THE SPREAD OF COMPUTERS LEADS TO A LIFE OF SITTING DOWN. IT DOESN'T HAVE TO BE LIKE THAT"

All in all he thinks embodied gaming has a lot of untapped potential. Dance games became a craze in the early 2000s, but even their current generation still uses pretty much the same game mechanism in which the player just has to step on the right buttons at the right moment. Where's the grace of modern dance, the expression, the aesthetic component? That's what Hämäläinen wants games to include in the future.

Given the Lab's interdisciplinary nature, cooperating with researchers from different backgrounds is not a problem. Of course the same metrics cannot be applied to artistic research and engineering research, but it doesn't mean that artistic research is done less rigorously.

Doing research in the context of an arts and design university has never posed problems for Lily Díaz. If she needs historical reassurance, she can take a look at Leonardo Da Vinci's notebooks, because what are they if not artistic research done by a highly skilled researcher?

For her, working in an interdisciplinary manner is about having something that's greater than the sum of its parts, about going beyond your own limits. It's about collaborating and building something new that combines existent things into something completely different.

Díaz uses the field of cultural heritage computing as an example. It has its own ACM Journal on Computing and Cultural Heritage (JOCCH) and places such as the University of Salzburg has a Cultural Heritage Computing facility. It combines different computer-related methodologies, such as textual analysis, image retrieval and image recognition and the physi-

cal and spiritual manifestations of human memory that we call heritage.

"The combination, interdisciplinarity makes it possible to reveal all kinds of interesting things, create new spaces, and do things you couldn't do before," Díaz says.

The important thing about working in an interdisciplinary (or transdisciplinary) environment is building a common base. It involves trusting and respecting every participant, but also being rigorous in your own work.

Rasmus Vuori, head of the MA in New Media Programme, has tried to keep his hands clear of the tug of war that is defining the difference between research and artistic work.

"I have my own way of working and I think that it's research, without a doubt," Vuori says.

First of all, he needs to find a way of expressing the things the artist wants to express. That takes research. Then he needs to analyse the prerequisites of the said means of expression and finally assess whether or not the original goals were met. That's all research.

Mostly he feels these questions can be solved by improved communications.

"A successful result from an artistic research process can be surprisingly different from other research."

He sees clear discrepancies between the urge to quantify all research and to produce MAs as fast as possible and the desire to reach the top spot on ranking lists. There's an intrinsic conflict between these objectives.

"A SUCCESSFUL RESULT FROM AN ARTISTIC RESEARCH PROCESS CAN BE SURPRISINGLY DIFFERENT FROM OTHER RESEARCH"

"Either you invest in the quality of teaching and have expensive, individualized teaching, or then you have an assembly line and let the quality suffer," Vuori believes.

For Koray Tahiroğlu, artistic research and the kind of research traditionally done by e.g. engineers don't have to be opposites. The artistic method brings flexibility, as it's a way of doing research by taking advantage of the artist's informed knowledge.

"Art is an internal dynamic. You reflect it through your experience and transform it into an object," he says.

Mika Tuomola is confident about the recognition artistic research gets in Aalto University. He quotes Helena Hyvönen, the ex-dean of Aalto School of Arts, Design and Architecture, who emphasized that Aalto's mission includes education, research, and art.

"Crucible Studios' work is very much research through art, and hopefully one with an impact on society," Tuomola says.

Pipsa Asiala too believes that separating art, design, and research is a futile exercise. The way she rationalizes it is that every decision is the result of a creative thinking process, irrespective of the field.

"We're constantly creating and iterating wonderful things in our art projects," Asiala says.

It can be expected that the new materials, technologies and media the students are working with in 2014 will be widely used in a few years time.

The Media Lab has always embraced a diverse selection of students at all levels, masters, doctoral studies and post-docs. Philip Dean points out one possible repercussion that had to be pre-empted, namely the situation where none of the researchers would have been graduates of the Lab.

"It's important for any university department to have a sustainable system whereby a graduate from a master's level can pursue research further in the same academic community," he says.

Still, the expectation isn't that all of the Lab's MA graduates will be interested in a research career. Many of the researchers come from the outside, like Nuno Correia.

Each doctoral thesis is a step into the unknown, no less so with artistic research. Correia's dissertation combined his passion for audiovisual art and artistic research, and it's still the longest project he's been involved with. It consisted of four different projects, with the last one — *AV Clash* — being a culmination of all the previous work.

"It's a project that allows you to manipulate sound and images in an integrated way, so that manipulating the audio has a reflection on the visuals and vice versa. It's a networked project, where you collect sounds from the web and visualize them. Additionally it lets you manipulate the sounds," Correia explains.

The project brought together many different aspects. It's net art that anyone can play with, but he also uses it to give performances, and it's also been displayed as an exhibition piece. Each research project is built upon what he had learned in the earlier ones, solving problems and adding more options. It shows in the work, as the last part not only got the best reception and the best online statistics but was also artistically more successful than the previous ones.

Correia felt he was carving out his own path with supervisors from HUT and a Spanish university but, even though others at the Lab weren't necessarily working on similar subjects, it didn't mean that his research efforts weren't supported. On the contrary, he got to build his own network through traveling to conferences and received plenty of help for that.

In his opinion Media Lab Helsinki is fertile ground to do research, if you're a motivated person. For more passive people, it might be a worse fit. It certainly worked out for him, as he is currently working on a project called Enabling Audiovisual User Interfaces, for which he obtained a Marie Curie EU fellowship.

Ultimately, gaining recognition for good work is very important. As such, the Lab's research work has been sanctioned by outside actors in terms of funding. Philip Dean compliments the way Tekes funded research projects at the Lab during its early years, because it concentrated on assessing the proposals instead of the formal qualifications of the applicants.

What matter are the idea and a credible way of making it happen. In the Lab's early years that enabled the people who had insight and vision to undertake research, work with companies and do international work, that all fed back into the studies and curriculum development.

In more recent years the Lab's researchers have also received post-doc funding from the Finnish Academy. The first recipient was Antti Raike in 2008-2010, soon to be followed by Koray Tahiroğlu.

2014 was a record year for the Lab in terms of new graduates. These included three new Doctors of Art with many more candidates due to defend their theses in coming years.

NEW MEDIA'S THIRD WAVE

Lily Díaz

There is a new Third Wave of technological innovation in computing in the making. The initial developments in information communication technologies, (ICT) where groups of highly trained engineering oriented communities interacted with large computing devices characterized the First Wave.

The emergence, implementation and consolidation of personal computing (PC) devices, were among the key features of the Second Wave. A redistribution of computing tasks throughout and into the objects of our everyday life is key to this Third Wave of ubiquitous computing. It is a distributed computing paradigm that also pre-supposes the object's awareness of its context and history to the extent that it can react to changes in its environment in a, so-called, "intelligent" manner.

The trajectory of this Third Wave's is supported through the intense development in research areas such as Ubiquitous and pervasive computing platforms, open data and visualization tools and 3D fabrication methods and hardware that will revolutionize the artifact production and delivery cycles of the last 200 years.

Though it is certainly impossible to cover the entire expanse, I will briefly discuss three current trends in the light of my own interests and work with new media and systems of representation and digital cultnral heritage.

Ubicomp or ambient computing

The term is used to refer to the pervasive use of information technology and computing power in all areas of human existence from industrial computing to everyday life. Marc Weiser, Chief Scientist at Xerox Parc in California, referred to this as "calm", human-centered and even intnitive computing.

Though this might have been the vision of one of its early realizers, it behooves ns to question whether these qualifiers still apply to Ubicomp as we are coming to know it. Perhaps the tangled vegetation metaphor of a jungle that exists at the border and as a result of the unabated distnrbances might be more apt to describe the impact of the technology in its augmentation of human consciousness.

Partly driven by the increasing miniaturization and devaluation of components as well as by a global cultnre of — both willing and coerced — ac-

ceptance, the use of ubiquitous and pervasive computing (Ubicomp) infrastructures (or hybrid platforms composed of stationary units and mobile devices) continues to increase.

As ever extending connective and connected elements that converge into systemic entities, these infrastructures already aim to reach the inner and outer edges of human existence. For the fact is that in its realization, the vision of ambient computing precludes the use of sensor environments to map, capture, analyze and ultimately influence human mobility.

Ubicomp infrastructures coalesce into cultural formations that bear an impact on the material and ideological aspects of society. Location data, or the name given to the results gathered through the tracking of our everyday whereabouts for example, has already become a marketable commodity and fuelled political debate regarding intrusion into everyday life. The potential misuse of such information in the context of political and legal agendas, by monitoring who visits an abortion clinic or comparing narrative accounts with physical location data for example, have already been documented.[1]

Yet as Hannah Arendt and others have noted, privacy should not be perceived as a monolithic static entity but something that emerges from a set of societal relations varying across time and cultures.[1] From a life lived in the family, to the life lived partly in society, to a life now instantiated in social networks, within the gaze of the camera, it is up to us to carefully consider the impact resulting from the tools we design.

Of course there are situations, as might be the case of crop monitoring through the use of satellite technology, where surveillance can have a potentially good effect. And there are also the cases, such as in sports events where the tools of surveillance including video cameras in combination with social media, can be used in a playful manner not only to gather date from the fans but also to create heightened and unique experiences. Then there are also cases where the technology is simply one amongst several layers in the design of a complex digital artifact.

The "Re-discovering Vrouw Maria" 3D historical reconstruction is an example of this situation.[3] *I*n this virtual reality installation realized at Media Lab Helsinki during the years 2010-2012, optical sensor technology allows us to deliver a gesture-based interface that enables navigation of an

[1] Krumm, John, "A survey of computational location privacy", *Personal Ubiquitious Computing* (2009) 13:391–399, Springer-Verlag London Limited.

[2] Arendt, Hanna, *The Human Condition*, University of Chicago Press, Chicago and London, 1958.

[3] Re-discovering Vrouw Maria website, http://sysrep.aalto.fi/vrouwmaria/, (Accessed 25.06.2014.)

otherwise inaccessible underwater heritage site. The focus is on achieving a 'ready-to-hand', seamless interaction with new artifact ecologies where the tool that extends human reach in space and time simply disappears.

Yet as an academic research institution, we should still be motivated to think responsibly and to support critical practices that consider both ethics and innovation. For though, increasingly, the ways and methods by which our presence, movements and tastes are continuously tracked continues to be a politically contested issue, there are open avenues and critical media design practices that can also yield innovation.

Consider the Stealth Wear developments which include concepts such as the use of specially designed fashion accessories for face detection camouflage, so-called DNA spoofing techniques that can scramble genetic material and enable anonymous physical trajectories, as well as, an anti-drone line of clothing (Harvey) which, though designed for the Middle East, can be used anywhere.[4]

Some basic questions for research in this area are: How does the new media both enable and constrain our conceptualization of human agency? How is this notion negotiated in Ubicomp systems design, since the technology itself precludes distributed models? How is the space that defines proximity and intimacy in contemporary human communities being altered? These are some of basic issues that invite further investigation, both from a theoretical as well as practical perspective.

Open data

The proliferation of digital devices, combined with the availability of inexpensive memory, together with the emergence of new digitally-based modes of acting in the world have resulted in an unprecedented deluge of data, the scale of which we have yet to fully comprehend. Open data, or the notion that certain data should be freely accessible for others to use and republish without restrictions, such as copyright and patent regulation, certainly has impacted on societal values.

It has also stimulated our desire to re-examine, learn from, and encourage

[4] Harvey, Adam. Stealth Wear, http://ahprojects.com. (Accessed 24.06.2014.)

the re-use (remix) of pre-existing cultural artifacts. The Creative Commons, with its licensing schemes providing alternatives to traditional copyright, is one of the great new developments in this area.

Almost every day in citizen involvement and governance, in communication and healthcare, to name a few, we see examples of new applications that can have beneficial effects in different areas of human activity. One example, that has found expression in the heritage category, is the online release by governments of archival data regarding population demographics.

It could be argued that the presence of this data has been instrumental to the success of a host of standalone and online tools and to the development of new interfaces and visualization instruments.

Access to population censuses now allows individuals to research their family roots for at least the past 150 years (and even further) in a relatively easy manner. In our fractured, "post-globalized", world of anomie,[5] through online communities such as Ancestry.org and MyHeritage.org, individuals across the globe are finding themselves, their relatives and their histories. Perhaps it is even the case that new identities will be forged through these new types of historical practices.

Coming together with these interests are the new genetics techniques that allow for encoding, analysis and visualization of vast amounts of data in ways that allow us to re-interpret and represent the history of local populations. From historic timelines of Europe in terms of grand narratives related to the Greco-Roman and Judeo-Christian traditions, it is now becoming possible to also learn about the diversity of ethnic groups and that once inhabited the continent.

In America, it has been possible to establish the existence of heritage that was once thought to be extinct. In contradiction to earlier historical sources, it is now documented how a very large percent of the Puerto Rican population carries the maternal DNA of its indigenous Taíno ancestors.

Here too, the new media stands to play an important role, since its variability already allows us to build multi-perspectival and multi-modal narratives that blend data in multiple formats such as statistics, images, sound and textual content and in doing so, bring us closer to this agglomeration. In this manner, the art of human storytelling is slowly but surely undergoing a deep transformation.

[5] Anomie is a term used by Emil Durkheim to describe the rupturing of the bonds between the individual and the community.

What will the history lesson of the future be like? As part of a simple exercise, one can envision a web mash-up that gathers the diverse geographical locations where one has spent significant moments of ones life, illustrated with meaningful images and sound. Correlated to this biographical narrative are linked the timelines of world history during the past 200 years.

Will our personal viewpoints throw light on key events related to population migration? How will we locate our selves in the timelines of human history? How will a technology-enabled, influenced, embodied notion of history affect our understanding of the subject?

An interesting example of these topics can be seen in our recent project on the "Haloo Akseli"[6] archive created as part of the work done in the "digGLAM"[7] project with the Gallen Kallela Museum. In this archive, the personal telephone directory of Finnish national painter Akseli Gallen Kallela provided the structure through which to organize the materials of an archive. Thus the "Haloo Akseli" archive can now potentially provide a glimpse of the social relations between the artist and a host of diverse personalities of his time.

But, what if this time around there is not a grand narrative of history to assist us with its interpretation? Instead we might be prompted to follow ludic strategies enacting multiple combinations of "What if?" scenarios. Considering our post-modern, post-canon ethos, the ongoing debates regarding open access to data vs. fenced meadows, rather than galvanizing the communities, might enable us to find new ways to trace our personal paths through multiple ecologies of knowledge, yet to be realized.

3D fabrication methods

Throughout the past year we have started to become involved with 3D fabrication as part of the digGLAM project. In this project, in addition to the "Haloo Akseli" archive, we have sought to develop a robot assistant to work in the digitalization process of document collections at small heritage institutions.

With this in mind, we have collaborated in the Project Gado[8] at Johns Hopkins University. While our partners in the Department of Computer

[6] Haloo Akseli, http://halooakseli.fi/collections/ (Accessed 26.06.2014.)

[7] digGLAM, http://sysrep.aalto.fi/digglam/ (Accessed 26.06.2014.)

[8] Project Gado, http://project-gado.org (Accessed 26.06.2014.)

Science at Aalto University, School of Science, have developed a Linux-based interface for the open source Gado2 robot assistant,[9] the researchers at Media Lab have worked with the museum experts and studied a selection of the communities that converge at this heritage institution.

It is interesting to ponder how Ubicomp might be adapted to heritage environments, since it is not only the technical systems' design that is important but also the content created with and through them. It is safe to assume that someday it will be possible, indeed, to "print" cultural matter and artifacts in 3D.

Nowadays the notion of creating a digital facsimile — or replica of an original artifact rendered and augmented with digital media — is an established concept. This concept, that we explored through our research with digital facsimiles, such as the Map of Mexico 1550 and the Carta Marina of 1539, need not be limited to objects but can expand to include environments. The prehistoric cave of *Grotte Chauvet*, a very recent addition to the list of World Heritage sites, is an example that this is already being considered.[10]

"OUR EFFORT IS AN EARLY EXAMPLE OF THIS TYPE OF WORK

In his review of one of the early publications about the discovery, art historian Ernst Gombrich compares the cavern to the Hubble Telescope in its ability to extend the range of our vision and provide us with an unexpectedly distant view of the past of human art. This is also evidence that the facsimile approach is now a regular framework used in research, preservation and dissemination strategies.

In the years to come, the 3D facsimile of the cave being developed will not only allow its study and preservation, but it will also enable us to experience the environment and art of *Grotte Chauvet*.

But what about in the cases where the items either no longer exist, or have come to be as part of what is referred to as the intangible heritage of human communities? Our effort to create a 3D historical re-construction of the "Finnish Pavilion at the 1900 World Fair in Paris"[11] is also an early example of this type of work, that involves an interdisciplinary collaboration and combines art and design and historical research with computer graphics, human computer interface (HCI) and new media.

[9] Project Gado, http://projectgado.org/aalto-university/ (Accessed 26.06.2014.)

[10] Grand Projet La Caverne du Pont D'Arc, http://lacavernedupontdarc.org/the-cavern-pont-darc/ (Accessed 26.06.2014.)

[11] The Finnish Pavilion at the 1900 World Fair in Paris, http://paviljonki.mlog.taik.fi. (Accessed 26.06.2014.)

To develop frameworks that allow us to better understand and render the intangible might be among the most exciting discoveries still to be realized in this area. One place to begin and where Ubicomp could make a contribution is through the development of concepts such as 'smart' souvenirs comprising multiple interaction layers that disclose the histories and narratives embedded within.

Here also is a notable opportunity for the new media to research and study how simulations can be used, not only to generate knowledge regarding the material world, but also as a source of inspiration for the new artifacts.

DESIGN & NEW MEDIA

chapter 04

Of the three major subjects in the MA programme at the Media Lab, two[1] include the words 'new media' — New Media Design and Production, and Sound in New Media. But what is new media, exactly?

When asked to define it, people often refer to Nicholas Negroponte's book Being Digital. According to him new media is the convergence of publishing, broadcasting, and computing. It is often represented by a diagram of overlapping and converging circles, where new media is the intersection of all three.

In the book, which was pnblished in 1995, Negroponte predicted that companies in all areas affected by convergence shonld be interested in the other areas. In short, IBM should be following what the New York Times is doing and in tnrn the Times should be watching the phone and cable TV operators.

As Teemu Leinonen sees it, convergence did take place, but not in the way Negroponte assumed. Instead of the established players transcending their limits, a gronp of new companies sprnng np and assumed their position in the new media part of the diagram.

"All three old industries tried to move into the centre. Rupert Murdoch bought MySpace, telecoms tried to become media companies, Microsoft built a search engine and acqnired an email service," Leinonen says.

It turned out that new media wasn't something that could easily be erected on the foundations of the old media. It was the opposite — a void that created room for new, emergent forms to take shape.

"It's the core of the read-write nature of the web. I don't see the 'new' in 'new media' as having a temporal meaning. It's closer to the definition of Neo-Renaissance," he says.

What he means by the comparison to Neo-Renaissance (or Renaissance Revival) is that even though 'new' has been a part of the name of the architectural style since the 19th century, nobody's suggesting the name should be changed because newer things have come along.

"I stand behind the concept of new media. Sometimes people back in Finland ask why we still cling to it, but it's an established concept in the United States at the very least. If you have people doing research and establishing chairs for professors of new media, I think that makes it concrete," he states, smiling.

[1] The third one is entitled Game Design and Production and it was launched in 2010.

The definition of new media can be a tricky thing, at least when people opt for too simple a definition. It's quite clear that new media can't be limited to meaning only digitized media, because nowadays everything's digital.

"WE'RE ALWAYS SEARCHING FOR THE 'NEW' IN NEW MEDIA"

"My argument is that we're always searching for the 'new' in new media. That's the task," says Philip Dean.

He quotes Lev Manovich's definition: the essential feature is codification. After cultural and media objects have been translated into code, they can be manipulated in new ways.

This approach means that things like digital cinema aren't within the Media Lab's scope as such. After all, cinema has existed for well over a century and it's been recorded on a variety of media during that time.

The change from 35mm photochemical film to digital cameras and Digital Cinema Packages is a logical development within the film industry, but doesn't suddenly make it new media — any more than radio becomes new media when sound is recorded using a digital recorder, edited on non-linear software and broadcast digitally.

Indeed, new media is digital and therefore modifiable in a way that concrete, non-digital media aren't. When digitized, sounds, images, videos, and all other kinds of media can be manipulated in ways that weren't possible before. New media is, in a word, programmable.

Another feature of new media was formulated by Lev Manovich in his 1998 paper entitled, Database as a Symbolic Form: "Many new media objects do not tell stories; they don't have beginning or end; in fact, they don't have any development, thematically, formally or otherwise which would organize their elements into a sequence. Instead, they are collections of individual items, where every item has the same significance as any other. "

Even as devices, paradigms, and programming languages come and go, data structures remain the essential part of new media.

Still, further distinctions with the terminology can be made. Perttu Hämäläinen avoids talking about new media, because 'new media' has been overloaded with meaning.

Perttu Hämäläinen, who is the main teaching professor within the Lab's Games Design studies, prefers the term interactive media. It fits Hämäläinen's research purposes in gaming better, as it points away from cinema and other traditional media. Interaction emphasizes the kinds of factors that cannot be completely anticipated, which in turn have an effect on the research methods and projects.

Working in new media means dealing with a moving target: the things that were unthinkable to most people 20 years ago are now a part of everyday life for hundreds of millions.

"We can look at the trends, the discourses, and the values new forms of media represent. Then we can place that in our own discourse by means of critical reflection," Mika Tuomola says.

The term new media has acquired different connotations since the turn of the millennium, after which comics have been prone to asking 'what's new about this new media exactly?' Maybe academia and its terminology aren't quite used to the way technologies drift in and out of fashion, like the Web 2.0 movement that became a laughing stock almost as quickly as it began.

"New media still exists and interesting companies and projects are born out of it. In fact it looks like it's expanding," Leinonen says.

New media innovations are the things that could not have happened without new media, even though now they might feel self-evident, because the convergence feels like a banal fact that's always been present. Cleaning Day, a hugely popular self-organized second-hand market day, is a new media phenomenon just as much as its cousin Restaurant day and the populist Finns party, the popularity of which grew, at least partly, out of online debate.

If new media is the core subject of the lab, then design is the practical and intellectual glue that holds together the work done at the Media Lab, creating a coherent whole from disparate components.

This means that the design process itself is of paramount importance. Marjo Mäenpää, Director at Division of Art Policy at the Ministry of Education and Culture, has spent a lot of time thinking about what happens in media design, where the creators are constantly exploring new ground and trying to find innovative ways of combining usability and substance.

"[Managing new media design] is a different world from managing bridge engineers who have blueprints and can calculate everything down to the last detail before they start building," Mäenpää says.

Dealing with immaterial processes is a much fuzzier thing. Quite often projects start out from an idea that has to be turned into a concept, which then has to be shaped into a working system or software product.

It's possible that the only things you know for certain are the deadline and the amount of resources you can spend.

"IT'S AN ITERATIVE PROCESS THAT REQUIRES AGILITY, A WILLINGNESS TO TRY NEW DIRECTIONS"

"When you start executing plans, you're bound to run into surprises that might take you in a completely new direction. You're working with users and users are different individuals. It's an iterative process that requires agility, a willingness to try new directions. Those are very fascinating cases," Mäenpää says.

A broad concept of design, in many different guises, was a strength of TAIK. She thinks it's well worth saving, because the goal is to produce design professionals who have the best possible know-how.

She likes the motto of Aalto University's School of Arts, Design and Architecture that dates back to the days of TAIK: "Pro arte utili," for useful art. It's been interpreted in several ways, but for her it emphasizes the difference between the lab's School and pure arts schools.

"We apply art in a way that includes the public, and that brings with it many different aspects, like ethics, aesthetics, and ecology," Mäenpää says.

To understand how design works in new media, it's illustrative to compare and contrast it with features of traditional media. For example, Nuno Correia's work includes interactive audiovisual elements, allowing the user to trigger and manipulate audio samples with simple drag and drop commands.

"From the audiovisual side we could compare it to a more traditional medium like cinema. From the interactive side we could compare interaction design and usability to traditional things like ergonomics in, say, chair design," Correia explains.

The emerging medium he works in shares some features with the traditional ones and Correia thinks digital designers have a lot to learn from traditional designers who shape physical, three-dimensional objects.

"But there are added elements in the digital medium, added nuances. For example the laws of physics don't apply, and you can be more metaphorical, or less metaphorical. Pixels and digital sounds create a lot of conditions that physical space doesn't," he says.

The classical approach to design has been solving a problem by concentrating on the interface, whether it's something you sit on or something you read. New media focuses on interaction.

This interaction happens through user interfaces. The way we handle a physical object is direct, whereas our contact with digital media tends to be, well, mediated. In digital media, the designer is more of a creator of meaning through representations of information.

"I emphasize the role of interaction, because that's something that I'm not really seeing that much of in other design fields, and it's also something that didn't exist before," Koray Tahiroğlu says.

In new media, the most important part of design is often hidden from view. The user interface is important in itself, but beneath all that lies the information architecture and the processes without which the user would have nothing to interface with.

Take games, for example. The graphics and the sound are designed to a high degree, but underlying them are the game mechanics, and that's where the game design process actually starts.

The same methods can be applied to media old and new. Rasmus Vuori explains how Erkki Huhtamo, a media historian and media archaeologist based at UCLA, demonstrated the parallels between garden landscaping and new media design.

[According to Huhtamo] "Gardens have different paths that create different stories, so they are, in essence, an interactive environment. This is user experience design in the context of a garden. Basically [new media] has just updated the tools," Vuori says.

The differences between new and traditional media are growing smaller all the time, with ubiquitous computing and augmented reality as the most

recent trends that bind the digital together with the physical. Vuori has noticed that many of the visions people used to scoff at have been realised, but maybe not in the ways that we expected. In some cases the development is cyclic with same things appearing and reappearing in different guises.

"One example is what we call social media. It's nothing completely new in itself, just a new iteration of the things that existed earlier," Vuori says.

Another facet of new media design is its multidisciplinary nature. Tahiroğlu, who leads the Sound and Physical Interaction research group, compares it to architecture, which is also multidisciplinary. There you have to have the engineering skills to understand structures, load bearing, and the way sunlight and artificial light work in the space, but you also have to understand how people will use the building.

In a similar fashion, the visual design aspect of new media has many things in common with graphic design, but also includes factors such as information architecture and the particulars of different media.

New media encompasses all senses and all media. Sound design is a design discipline like any other, the material it deals with just happens to be sound. For example in comparison to graphic design, instead of a visual gestalt theory the perceptions are underlined by psychoacoustics. Antti Ikonen says it also means that sound design can be evaluated according to the same criteria as all design; by considering ergonomics, ethics, aesthetics, and ecology.

Audio has long played second fiddle to other media, but the tide might slowly be turning. Ikonen tells the story of Richard Lapington, a graduate of the Sound Design program at the Media Lab.

Soon after graduating he was hired at a British computer game company, where he found a siloed work culture. The programmers were sitting in one corner of the office, the graphic designers in a different one and level designers in yet another place.

Lapington suggested they form so-called crash teams[2] where different professionals work together towards a common goal, instead of having everyone take a pass at the process in turn and then finally handing it over to the sound department the day before the deadline.

[2] The name 'crash team' derives from their original function of designing car crashes for an upcoming game.

"He told me that his idea for this way of working came from the Media Lab, where design challenges were solved in interdisciplinary teams," Ikonen says.

The aforementioned Sound and Physical Interaction or SOPI research group is an apt demonstration of how much latitude new media design can have. The name alone might sound paradoxical to some — what does sound have to do with physicality?

"HIS IDEA FOR THIS WAY OF WORKING CAME FROM THE MEDIA LAB, WHERE DESIGN CHALLENGES WERE SOLVED IN INTERDISCIPLINARY TEAMS"

To help understand it, one could take a look at the development of Tahiroğlu's academic career. He applied for a MA in the Media Lab in 2000, having previously studied architecture at a university in Istanbul. During his studies he got involved in new media projects, such as building a virtual online museum of sculpture and fine art, and creating websites for artists.

It became clear that he wasn't going to become an architect. His interest in music kept pulling him in a different direction. The first research project Tahiroğlu took part in at the Media Lab didn't involve music at all. Rather it was a trust-based network application, where people with shared destinations could share rides.

He graduated in 2003, decided to continue onto doctoral studies, and received his DA in 2008. Now in 2014 he's a postdoc with his own research group, called SOPI.

Tahiroğlu started by looking into digital representations of sound, which led to him creating interactive sound-based systems. His master's thesis was a virtual band, where you could play one instrument like the guitar, and the system would accompany the playing with bass, drums and a piano, creating an environment for virtual improvisation.

He got more and more interested in interaction and how people employ new media technologies in ways that weren't even possible a few years earlier. For example, through innovations such as Napster, iTunes, and Spotify, the way we use and consume music now is very different from how we did it in 2000.

Tahiroğlu isn't studying the business models of popular music, but he is very interested in the next steps of sound as new media.

"From looking at the digital representation of sound, my interests moved all the way to how we can physically engage with digital artefacts."

For those purposes, the Media Lab is a great environment, because it lets researchers combine their interest in creating art and studying design.

Design isn't merely about fashioning pleasurable objects — not by a long shot. Professor Lily Díaz works with digital cultural heritage and new media design and theory. For her the role of design in new media is subservient to the larger goals.

"It's about communication and creating communication products," she says.

As devices are getting smarter by the day, new kinds of problems arise. She takes the example of a simple coffee pot. It's clearly a device that has no will, no agency of its own. When turned on, it's on, and when turned off, it's off.

This used to be self-evident, but now with connectivity seeping into every machine, it's no longer so. Díaz picks up her phone from her desk.

"This thing stays with me all the time and I have a sense of trust that it's not going to explode in my face. It's about communication, trust, experience."

She points at the lens of the webcam. A maliciously installed Remote Administration Tools or RAT would allow for an easy takeover of a user's webcam. There have been reports of RAT infestations where a single attacker keeps tabs on dozens or even hundreds of computer users without them ever knowing about it. It's not a hypothetical sci-fi threat, it's something that a teenager can do with readily available software.

So you can see why computers have trust issues that don't resemble those of coffee pots[3]. And it's only the beginning. She gestures towards the laptop on her desk.

"We're coming into the third wave of computing. What's finally beginning to happen is that this rigid shell is giving way. Computers are already merging into objects of everyday life, so it becomes about building the interaction with these kinds of objects."

In 2013, Díaz was on the jury of a competition where one participant demonstrated her idea of cheap, wearable radios that adapt to the body.

[3] Curiously the distance between computers and coffee pots isn't nearly as wide as you might expect. The so-called Trojan Room coffee pot was the target of the world's first webcam, set up in a computer laboratory of The University of Cambridge.

Instead of having devices as external attachments, we could embody them.

"I think that's amazing. I wouldn't be carrying a phone in my pocket, but have it as a part of something that I wear: light, comfortable, and safe," Díaz says.

For example, she envisions building a quilt that's made out of a beautiful material, but at the same time is multimodal with sound and images.

"That's possible. It's a little door to a future of things that have never been seen or experienced," she says.

Design can be applied in ways that reach even deeper into our shared lives. "Redesigning society" is an umbrella term for a large variety of activities, including such questions as how our current society is designed and what is happening to that design as society continues to evolve. It also means taking into consideration the fact that all political acts, be they austerity measures or easing regulations, are a kind of active redesign.

"IT'S A LITTLE DOOR TO A FUTURE OF THINGS THAT HAVE NEVER BEEN SEEN OR EXPERIENCED"

If in the 20th century everybody was a happy consumer, now the problem for many people becomes 'how do I make a living' and 'how do I make a living ten years from now?' These are the kind of questions Kari-Hans Kommonen and his Arki research group grapple with.

What can be done to ensure that as many people as possible have the tools to design their own life? Tweaking with details is no longer enough.

"Finland as a nation has to focus its effort on helping people succeed on their own, and not just as factory workers and consumers," Kommonen says.

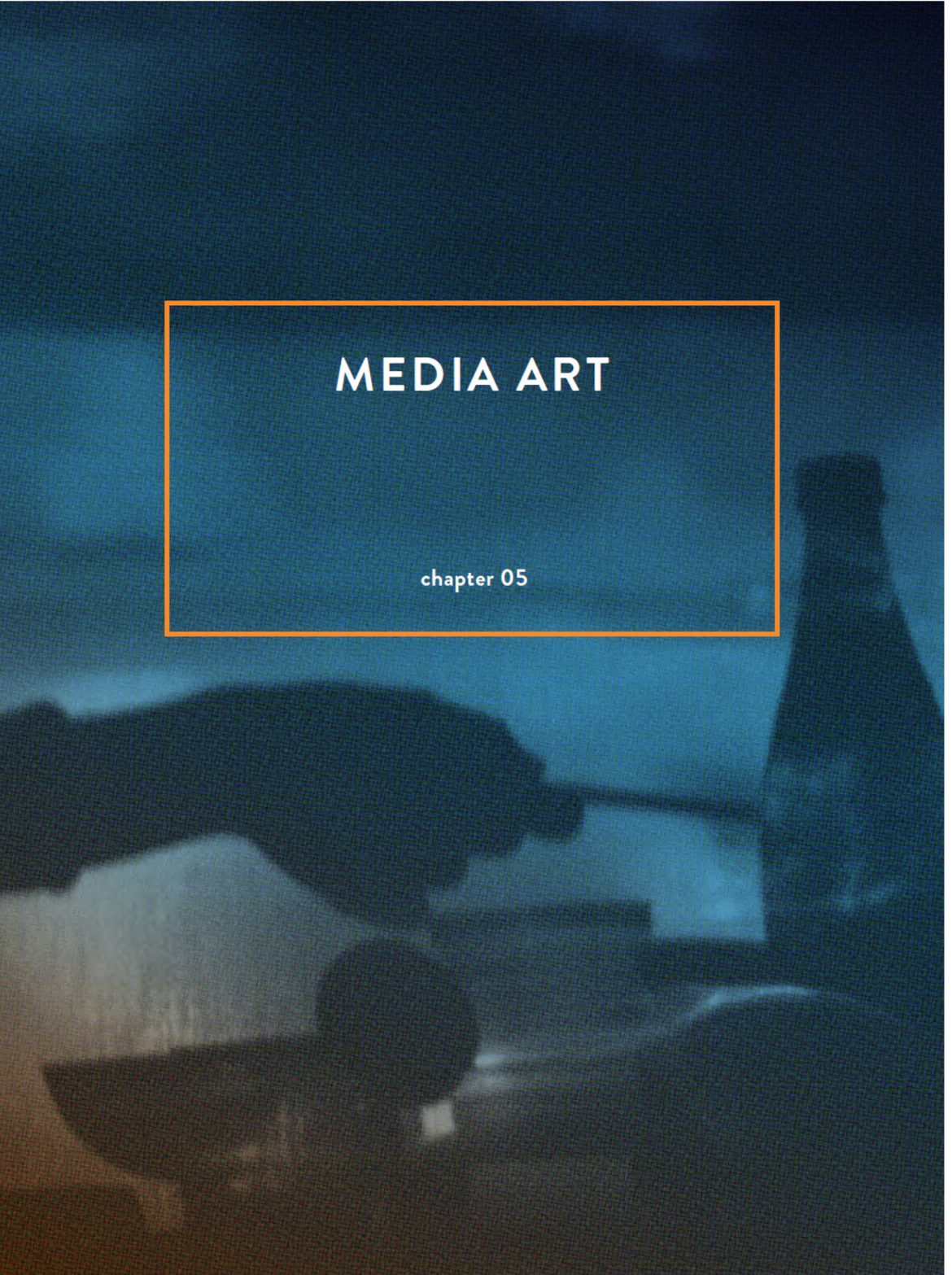
Here's what he suggests: Maybe it's time we started to recognize the design process inherent in politics and take a look at the big picture. In his view that would mean getting rid of the bane of local optimization that leads to solutions such as supporting export companies that deal in physical goods.

"Nowadays companies and products look so different. In the past a hit product had to be manufactured somewhere. A digital product only has to be manufactured once, after which it can be copied at will. The whole

phase of manufacturing has disappeared. This means we have to rethink where our jobs come from," Kommonen says.

He doesn't predict a future where everyone makes their living working with digital goods, meaning one solution won't fit all needs and this makes the need for redesigning society ever more urgent.

"Thinking about these matters is important, and it's important that you remember the design angle, and one that emphasizes the digital."



MEDIA ART

chapter 05

Media art is Finland's leading art export right now, argues Perttu Rastas, special planner at Kiasma Museum of Contemporary Art. Some have gone as far as to talk about a second Golden Age of Finnish art, after the first Golden Age of artists like Gallen-Kallela at around the turn of the 19th century.

For example the Finnish media artist Eija-Liisa Ahtila would make any list of the one hundred most important contemporary artists. Our neighbouring countries haven't made nearly as big a mark on the international media art scene.

Here the influence of the Media Lab is irrefutable, even though much of the output from the Lab's students has gone into other avenues. To take just when example: When asked to name a memorable piece of media art, Rastas picks *White Square* by Hanna Haaslahti, who graduated from the Media Lab in 2001.

"It's a simple installation where you enter the gallery and see a white square of light on the floor. Once you step on it, a shadow is cast. The shadow is interactive, it has a life of its own and starts moving around without you," Rastas explains.

The effects range from simple to quite complex, but what's intriguing is the reaction of the museum visitors. Some stand still and watch White Square work its magic, while others swirl around as if trying to make the artwork lose track of them, and yet others move around gently like children who are just getting to know the world.

"It's an excellent work of art that involved a lot of programming, but it's all been hidden from the viewer, so that all that is left is you and your shadow. I think it exemplifies the way technology and art can combine. There's no other way to achieve the same effect," Rastas says.

Perttu Rastas has been following the development of the Finnish media art scene from ringside seats. He has been working at Kiasma for nearly two decades, and his connection to the Lab goes back even further.

"I wouldn't have minded a more art-led approach at the Lab, but design and technology took pole position. Yet art has always been a part of it too, and the Lab has produced many artists that I've later on worked with here at Kiasma," Rastas says.

To Rastas, the connection between Kiasma and the Media Lab is obvious. Media Lab Helsinki was the first Finnish unit that provided university-level

training, which was based on design and media art, along with relevant resources, such as computers and software.

"The Academy of Fine Arts [of the University of the Arts] didn't have anything like that, so it was only natural that the Media Lab would be the place [for media art]," he says.

Art, and more specifically media art, has always been present at the Media Lab — and it is obliquely referred to in the mission statement — but it was never made a priority.

It would have been the wrong decision to orient the Media Lab in the direction of the Academy of Fine Arts and to become the media art department of TAIK, argues Philip Dean. Kari-Hans Kommonen agrees. "Everybody agrees that art benefits mankind as a whole, but an artist can't be forced to explain herself. Finland already has The Academy of Fine Arts to represent the art field," he specifies.

"ART, AND MORE SPECIFICALLY MEDIA ART, HAS ALWAYS BEEN PRESENT AT THE MEDIA LAB"

However, some of the Lab's students were always going to be more interested in art than design and would plan their studies accordingly. Rather than fighting this, the Lab has accepted it. The decision to concentrate on design was made early on but in an understanding that artistic practice is also very close to much design practice. Design-oriented education can also serve the needs of media artists.

There are several people who've graduated from Media Lab Helsinki and stayed the course as artists. One of them is Hanna Haaslahti, who has held many solo exhibitions works in the field of visual arts, interactive installations and experimental film. Another prominent Finnish media artist, Heidi Tikka, had an influential role at the Lab and currently works on context and site-specific installations that experiment with the human-computer interface. She is currently working on her DA studies at the Media Lab.

Perttu Rastas laments the lack of proper media art training and the dwindling number of media artists, but at the same time understands the reasons. Especially with the spread of the web, media design became such a central part of business that a lot of people went in that direction.

One of those people is Aki Kivelä, who has a direct connection with Kiasma. Kivelä was in the first class of students at the Media Lab and did his non-military service at Kiasma. He programmed the space reservation system at the museum, which is still in use today, almost two decades later. When Kivelä was interviewed for the 10th anniversary book in 2004, he described himself as having an interest in visual culture, sound and music, but he ended up starting a new media company with a friend.

So what separates design from art? For Kommonen, the answer can be found by looking at where the loyalties of the creator lie.

"A designer always has a responsibility towards other people, whereas an artist is only responsible to herself. With design, you can always pose the questions 'what does this mean to others, how does this benefit others?', and the questions have to be answerable," Kommonen says.

Dean concurs: "It's generally accepted that design has certain denominators. There's an order, a task, a definition of what has to be produced."

Teemu Leinonen agrees that creating artefacts is a part of the Media Lab, even though it's not the main focus. It's also the reason he thinks it's important for the Media Lab to have a presence in the arts, even if the extent of this presence is debated from time to time. Art is a way of experiencing the world and looking at it, but training artists isn't one of the Lab's core missions.

By his estimate, out of every class of 25 or so students maybe two or three will become working artists. Everyone else will have had a chance to try out different media and approaches at the Media Lab, but they'll still mostly end up as designers or consultants.

"It similar to what's happening at the architecture department. The students create art projects that serve as tools in an architect's tool box," Leinonen says.

Rasmus Vuori, head of the MA in New Media Programme, thinks that critical thinking and art go hand in hand, and that alone is reason enough for students to engage with art.

"Our doors are wide open. I think it's important that our students include artists with different ambitions and visions, because that results in a better dialogue," he says.

The artists' way of looking at things, like — "how can I misuse this in a creative way?" — is a good practice for everybody dealing with new media, as the field is in constant flux.

One way of thinking about the role media art plays at the Lab is to view it as an experimental method that could be seen as analogous to experimenting in research. Unlike photography and other more traditional arts, media art mostly lives outside galleries, at festivals and VJ performances. Depending on the context, some media art can be understood as experimental interaction design.

"IT'S IMPORTANT THAT OUR STUDENTS INCLUDE ARTISTS WITH DIFFERENT AMBITIONS AND VISIONS, BECAUSE THAT RESULTS IN A BETTER DIALOGUE"

Philip Dean gives an example. Does Koray Tahiroğlu's work in the SOPI research group become art if it's presented at a festival? Or does it become research when funded by Nokia Research Center, as it has been?

Another example is the strong presence the Lab had at Ars Electronica 2006, an internationally recognized digital art festival, where they were asked to create the campus exhibition. Some 50 works by the Lab's staff and students were presented there. Most visitors who saw the exhibition probably thought of it in the context of media art, but for the Media Lab it was a way to showcase a mixture of research, teaching, and artistic work.

In a similar vein, if everything goes according to plan, the Media Art Histories conference will be organized in Espoo in 2017. It's a biannual international conference with an interdisciplinary approach to the history of media art, with some 400–500 researchers attending. Lily Díaz is part of the group of people applying for the 2017 conference.

This conference would be another good example of the Lab's participation in international new media gatherings, which have included involvement with Pixelache, Katastro.fi, and the ISEA conferences in 1994 and 2004.

The field of media art poses many practical problems for an aspiring artist. One of them is the fact that the media art circuit is smaller than the traditional ones, meaning fewer galleries and festivals where newcomers, or even established artists, can present their work.

This means that budding media artists need to wear many hats. If they can't fund their art by making art, they might work as teachers, give talks, or put on performances. It makes building a career tricky. It is also notoriously difficult to sell media art.

That's hardly news, as rare is the artist who hasn't had to support him, or herself, by working on something completely different. According to Nuno Correia, the difference is that media art hasn't managed to grow like other fields of art traditionally have. Even video art and video artists seem established in comparison to media artists.

"Some institutions find it easier to get funding if there's an educational angle instead of just, let's say, having a concert. Maybe it's a good thing that the artist isn't just someone who shows up to display her beautiful craft, but is also empowering others," he says.

If media art as a whole is a fringe activity, media art that focuses solely on sound is on the outer rim of that fringe. The Sound in New Media MA programme includes two sound art workshops in its curriculum and Sibelius Academy, a partner in the programme, provides a few similar courses.

"Finland is such a small country and sound art is such a small scene," Antti Ikonen says.

The only Finnish art gallery that focuses on sound art is Petri Kuljuntausta's Akusmata in Töölö. Kuljuntausta has supervised some of the Lab's MA theses and the Lab's students have displayed their work at the gallery.

Not that the commercial circles for audio are much bigger. Ikonen is a founding member of The Finnish Game Audio Network FinnGAN, which includes everybody who works with audio in gaming. In Ikonen's view, both sound art and game audio are academic areas worth exploring, but in the end he doesn't draw clear distinctions between them or even the more engineering-oriented areas, like the considerations and use of sound in architecture.

As Perttu Rastas sees it, the history of media art is the history of technological inventions and their (mis)appropriation for various uses.

"After cinema and photography became mainstream, their offshoots have been interesting to media artists. It's a curious thing how such a large proportion of inventions have been created through errors. It's almost a rule that the inventors themselves don't understand what they've created," he says.

According to Rastas, in the United States universities and companies have always relied on artists to come up with new uses and exploitations of media technologies. That's not how they present it, but that's what it is in practice: "You create art and we'll keep an eye on you in case something interesting comes out of it."

You don't even have to cross the Atlantic to find examples of this. One example is Erkki Kurenniemi, the grand old man of Finnish electronic music and art. He also has a connection to the Lab, where he taught during the late 1990s.

Kurenniemi wrote an article entitled 'Message is Massage' in 1971. It's a collage piece in which he makes offhanded remarks about an artist's tool in the year 1983 — and the functionality happens to sound very much like current-day tablet computers.

"At the time, nobody understood this line of thinking, and nobody picked up on it. It was just a futurist's dream," says Rastas.

In the early 1980s Kurenniemi came up with the term 'Personal Communicator', which Nokia then appropriated.

"Kurenniemi was the kind of researcher-artist that someone at Nokia should've kept tabs on at all times. Mika Pantzar [researcher professor at National Consumer Centre and Academy research fellow at Aalto University] has stated that Google is now considering things that Kurenniemi was thinking about 20 years ago. An artist's work is free association that sometimes produces things that are of use to corporations," says Rastas.

"UNIVERSITIES AND COMPANIES HAVE ALWAYS RELIED ON ARTISTS TO COME UP WITH NEW USES AND EXPLOITATIONS OF MEDIA TECHNOLOGIES."

He points out that many of the things Erkki Kurenniemi did in the 1970s only came to be understood through the concept of media art.

"In retrospect many inventions seem self-evident, but in their time they were revolutionary ideas. Art history teaches us that the most radical artists and works of art are always understood only in retrospect. The process takes time and requires that a certain kind of cultural wheel of time lurches forward before the brightest ideas come out," Rastas says.

Rastas has a rather philosophical view of the function of media art and media artists: They are meant to study the way technology works, to explore it and to warn us.

He too draws a clear connection between traditional research and the work of artists. Given that the history of the 20th and 21st centuries has been one of new, ever more rapidly spreading media, then media art surely has a significant role to play.

"Great art acts as a warning sign. It explores a new area so that the rest of us can take a good look at it and decide if we want to move in that direction," Rastas says.

The roots of media art go back to video art. In the 1960s and 1970s video was a revolutionary medium, one that was cheap and versatile enough for various artistic purposes. After the introduction and spread of home computing, media art began to take shape.

If the defining feature of video art is the audiovisual nature of the medium, then the defining feature of media art is interactivity; in other words, in media art the artist and the user come together through the medium.

Interactivity is the tissue that combines interactive design with interactive art, the latter effectively being a synonym of media art.

Rastas organized interactive art shows in the 1990s at the Otso gallery in Espoo, now a part of EMMA, the Espoo Museum of Modern Art.

"I think those shows inspired a lot of people. We showed work from top international artists, and they showed what interactivity could mean," Rastas says.

There's no reason why a piece of media art would have to be audiovisual in nature per se, but the two tend to go hand in hand. The definition is somewhat murky and porous.

"Kiasma has a collection of media art that encompasses various kinds of pieces, but video art and video installations are central to all [contemporary] museums," says Rastas.

Media art still has a tendency to get overshadowed by the larger phenomenon of video art. Heidi Tikka had a concrete reminder of that during 2008 — 2012 when, after leaving the Media Lab, she worked as the media art production consultant for AVEK, The Promotion Centre for Audiovisual Culture.

Pretty much any artwork with an audiovisual component counts as media art in Finland. Tikka says that 80 percent — "by a conservative estimate" — of the media art funded by AVEK is actually video art.

The two are intimately connected. In her teaching, she used 1970s video art as an example of the kind of problematization and critical thinking that was essential to all media art.

Yet the two concepts aren't interchangeable. Around the turn of the millennium, an exhibition called 'F2F: New Media Art From Finland' toured North America and Europe. Tikka says that when it was first being put together, the promotional organization *Frame Visual Art Finland* had suggested mostly video artists for the exhibition.

"The producer told me that they weren't trying to assemble a video art exhibition, but something that explored the limits of digital art," Tikka says.

In the end, the exhibition consisted of works by many graduates and teachers of the Media Lab Helsinki.

"I still sometimes wonder where the momentum went. Why doesn't Finland produce more good media art?" she asks.

Thinking more broadly about the role of media, Rastas points to the development of the Finnish gaming industry as the leading audiovisual medium of our time. It's not exactly a lament for the lack of influence media art has, but rather an acceptance of the realities.

"Gaming is huge and media art has always been in the margins. If you look at history, photography, cinema, television and now games have been the most influential forms," Rastas says.

Through his work, Perttu Rastas is highly concerned about the conservation and archiving of media art, which is very often hardware and software dependent.

The situation is somewhat perverse, because trained conservators can restore a 17th-century painting, but media art from the 1990s is beyond their reach. Still a museum can barely document the media art they've displayed, let alone put it on display again after the first showing.

"Many of our experimental interactive works can't be displayed, because the technology they were built on is dying."

The problem is compounded by the fact that museums tend to treat art as unchanging artefacts, whereas change and evolution is an essential part of media art. Paradoxically this could end up implying that the more forward-oriented the artwork, the less likely it is to get saved for future generations.

"MUSEUMS TEND TO TREAT ART AS UNCHANGING ARTEFACTS, WHEREAS CHANGE AND EVOLUTION IS AN ESSENTIAL PART OF MEDIA ART"

Finally: what comes next? Rastas has been eyeing the development of bioart and he believes it might finally be on the verge of breaking through. The cybernetic fusing together of man and machine is a subject that has long interested media artists, and as technology becomes embedded in our lives, the pioneering nature of their work is clearer than ever.

"Art will always live in the margins. It can never be the central defining force in society," he says.

Whatever the future of media art might bring, it's almost certain to find its way to the Media Lab as well.

NARRATIVE EXPLORATION VIA MEDIA ART

by Mika Tuomola

They scratch with their pens... and the ink and the anguish start,
For the Devil mutters behind the leaves: "It's pretty, but is it Art?"
–Rudyard Kipling, The Conundrum of the Workshops (1890)

Mika 'Lumi' Tuomola introduces a selected chronological collection of Media Lab's, Crucible Studio research group's artistic productions.

The Art of Storytelling in New Media research group, Crucible Studio, was originally established in 2002 as a collaboration of the Media Lab with the Media Centre LUME, when I was the visiting artist at Media Lab Helsinki. As the lead author of the artistic and practice-based research studio proposal, I also started to head it until now.

The studio *per se* does not focus on (Media) Art, but on any generative, interactive and enactive use of narrative in New Media production and design. However, in the investigation of storytelling and drama, experimental Media Art productions — while usually maintaining their standing as art works of their own right as well — have been and are useful tools of exploration via research questions like:

- How to bring both designers'/authors' and users'/participants' internal intentions into a dramatically interesting dialogue/chorus within a mediated interaction environment?
- What kinds of media database, system, interaction and narrative logics may be able to generate a dramatic interactive experience with coherent audiovisual langnage?
- What are the ethics of (narrative) aesthetics, when designed participatory processes orchestrate multiple points of view?
- How have the audience genre expectations evolved (e.g. via games and social media) considering what an interactive/enactive drama/art experience is and how does it influence onr design work?

The borders between low and high, established and experimental, contemporary and new, art and entertainment etc. are delightfully low in the Media Art scene. For example, my own Media Lab final degree work, the

online series *Daisy's Amazing Discoveries*[1] by Coronet Interactive Ltd., got its main reputation in Media Art scene and is currently introduced in the *Digital Performance - A History of New Media in Theater, Dance, Performance Art, and Installation* MIT Press compendium by Steve Dixon[2]:

> *Daisy's Amazing Discoveries, a five-part nonlinear interactive drama, also came online in 1996, and was in its day by far the most theatrical and artistically sophisticated example of the genre. The ambitious, state-of-the-art Finnish production (in English) traces Daisy's journey as she leaves a travelling circus to pursue her romantic dreams in the city. It is innovative in both concept and design, with imaginative interactive elements, and some stunning and elaborate photomontage interface screens created in Photoshop.*

Without raising or discussing further the low borders in Media Art and performance, I introduce a volume of Crucible Studio productions that investigate the matter, the Shakespearian "stuff" of which "dreams are made on," that also Art investigates.

Shift

> *People say that what we're all seeking is a meaning of life. I don't think that's what we're really seeking. I think that what we're seeking is an experience of being alive, so that our life experiences on the purely physical plane will have resonances within our own innermost being and reality, so that we actually feel the rapture of being alive.*[3]

The very first Crucible Studio research production *Shift*[4] was produced as an experimental outcome of the Media Lab Fall seminar *Myth and Digital Media*[5]. The seminar investigated comparative mythologist Joseph Campbell's approach to myths of various cultures, while the approach was reflected upon in terms of contemporary culture by investigating the possibilities of influencing or contributing to the arising cultural narratives, patterns and images, the systems of representation in digital media. *Shift* was realised to simulate the nonlinear seminar discussion and give flesh to it through the means of moving image, dance and music.

Twelve hours of seminar discussion about the significance of myths in today's world were recorded on video, analysed and sorted out into 316 statements and questions. The points of view in the preceding material were dramatised into highly associative, poetic or aphoristic lines for two dramatis personae: materialist-atheist-pragmatist Woman/Ying (voice by Hanna Harris) and idealist-mystic-dreamer Man/Yang (voice by Mika 'Lumi' Tuomola). The lines were recorded and experimented further with so that the computer could play them in any random order, yet still the illusion of dialogue would be maintained.

We shot, edited and added twenty-six contemporary, associative dance clips of Buddha dancing (choreographed and danced by Aki Suzuki). The dance clips were produced in a manner suggesting that Woman and Man are talking inside Buddha's stomach. Also, generative film music of various moods was produced.

In the final outcome of *Shift*, the voice-overs, video and music are edited real-time 24/7 by computer using both randomisation and a very simple likelihood logic of media organisation (developed by Markus Norrena). The number of possible works created is, as they say, infinite, while the public gallery exhibits (e.g. Arctic Art 2002, Tromsø, Norway) showed that the 24/7 generative computer-edit seems completely human edited. *Shift* demonstrates the possibilities of algorithmically directed databases, associative and metaphorical scriptwriting – and chance – as opportunities for creating more complex computer-generated characters and for making the generally mechanical behaviour of computers more invisible and unexpected.

"THE NUMBER OF POSSIBLE WORKS CREATED IS, AS THEY SAY, INFINITE"

RuneDance

The artistic research on chance operations in the tale-telling of myths via performance have been further investigated by the studio's visiting artist

[1] Tuomola, M. & Leskinen, H. (1998). Daisy's Amazing Discoveries: Part I – The Production & Part II - Learning from Interactive Drama. *Digital Creativity Journal*. Vol. 9, No. 2-3, pp. 75-90 & 137-152.

[2] Dixon, S. (2007) *Digital Performance - A History of New Media in Theater, Dance, Performance Art, and Installation*. MIT Press, Cambridge Massachusetts.

[3] Campbell, J. (1991) The Power of Myth. Doubleday, New York.

[4] Tuomola, M. (dir.) etc. (2002) Shift. Generative dance movie production (available on CD). Media Lab Helsinki, Aalto University School of Art and Design.

[5] Randlepp, E. etc. (2002) Myth and Digital Media. http://mlab.taik.fi/myth/ (25.6.2014).

Maureen Thomas in 2003-6 in the *RuneDance* production (choreographed by Petri Kekoni). The live performance was collaboratively developed with advanced students from Sibelius Academy, Theatre Academy and the University of Art and Design Helsinki.

The performance was recorded on video and recombinant poetics (music, voice and image) were used to explore myth characters and tales interactively, creating a contemporary digital experience of Finnish cultural heritage and oral storytelling. Karoliina Yli-Honko of the *Liikekieli* online dance journal[6] reviewed the Kuopio Dance Festival 2006 performance:

> *A successful tapestry of new and old. The world it creates is mythical and mysterious, but still accessible... the young dancers embody the spirit of the work. Choreographer Petri Kekoni skillfully orchestrates the lively and sinuous movements of the group of 11 dancers... The piece is whole, and successful.*

Tulse Luper Journey

In 2004, writer-dramaturge Riikka Pelo and artist-animator Milla Moilanen took the laborious task to teach and coordinate the *Tulse Luper Journey* study project in order to produce a portion of the European game-world based on Peter Greenaway's film trilogy *Tulse Luper Suitcases*[7]. They also created their own game events as a part of the production.

As an artistic research production, *Tulse Luper Journey*[8] explored the thresholds of cinematic storytelling and game design in the process of adapting fragments of Greenaway's films into elements of the multiplayer online game environment released in Spring 2006.

The specific works of art, 92 puzzling suitcases, were created by several production teams and were based on the protagonist Tulse Luper's posthumous archives and each of them revealing a slice of the mystery of his life. In Crucible Studio, 25 suitcases of the total 92 miniature animations and puzzle games, were dramatized and produced in collaboration of artists and students in several tutored workshops during the study year 2004–2005. Students participated in the whole development and production process from the scriptwriting and puzzle game development phase until the refinement of the final pieces in small production teams.

The story of Tulse Luper, a professional writer, list maker and a prisoner, experiencing the 20th century through its forgotten oddities, is realized as a huge cross media production according to Peter Greenaway's challenging vision of the revolution in cinematic narration. The total production consists not only of 3 motion pictures and the online game, but also of interactive DVD productions, television series, website archives, books and travelling exhibitions, all reconstructing the life of the protagonist and European history in surreal and encyclopaedic ways.

Tulse Luper Journey was a collaboration between several European media and art schools, universities, production companies and artists, coordinated by the Dutch production company Submarine. It was supported by EU Culture 2000 and received the 2006 Animago Award in the Professional/Interactive/Games category in Munchen, and the 2006 Europrix Top Talent Award in the Games category.

Accidental lovers

> *Don't believe him, he'll break your heart! - Go ahead! Let yourselves go.- Love conquers everything! - To have any chance for long-term happiness in a personal relationship, you need to be honest, you cannot hide anything.*
> - Anonymized SMS messages to *Accidental Lovers*

Have you ever shouted or thought out advice for fictional characters? Have you ever wanted to express your interpretation of a story theme to others? Have you ever wanted to influence the plot of a television series?

The interactive dark musical comedy series *Accidental Lovers*[9] enabled this for Finnish YLE television audiences each Wednesday and Friday evening between 27th December 2006 and 5th January 2007. It featured as main characters the sixty-one-years old cabaret singer Juulia (Kristiina Elstelä) and thirty-years-younger pop star Roope (Lorenz Backman), who met as next-door neighbours in Merihaka, Helsinki.

[6] Yli-Honko, Karoliina (June 2006). Review of *RuneDance. Liikekieli: http://www.liikekieli.com* (24.6.2014).

[7] *Tulse Luper Suitcases* (2003-4, dir. Greenaway, Peter). Netherlands, Italy, Spain.

[8] *Tulse Luper Journey* (2006). Submarine, Netherlands. http://www.tulseluperjourney.com (24.6. 2014).

[9] Tuomola, M. (dir.), Saarinen, L., Nurminen, M. etc. (2006) Accidental Lovers (Sydän kierroksella). Interactive dark musical comedy for television. Crucible Studio at Media Lab Helsinki, Aalto University School of Art and Design & YLE, The Finnish Broadcasting Company. Broadcast on Channel TV1 by YLE, December 2006 – January 2007.

Viewers were able to influence the unfolding drama while it was being presented, by sending mobile text messages to the broadcast encouraging, or attempting to spoil, a possible love affair between the two unlikely lovers. The messages were completely unstructured: viewers could send any thoughts, any suggestions, any directions, at any point during each episode.

A glowing heart showed whether the audience messages were warming or cooling the hearts of the romantic couple, and viewers saw the relationship develop according to their comments to and discussion with characters and other audience members. To enhance the sense of participation, while all viewers received a personal text message from the broadcast system, some viewers saw their selected text messages displayed on the screen and heard the characters voice-over response to their texts. Accidental Lovers is thus a conversation between participating viewers and the dramatic production, but also, as an inherent effect, between the participants themselves. Many "cycles of love" were broadcasted in a row, creating a cyclical dramaturgical structure comparable to films like Lola rentt[10] and Groundhog Day[11].

"ACCIDENTAL LOVERS IS THUS A CONVERSATION BETWEEN PARTICIPATING VIEWERS AND THE DRAMATIC PRODUCTION"

Each episode was automatically edited in real time to best reflect the input received from the participating viewers. Both the authoring of the computational narrative structures, on the basis of which the automatic editing was carried out, and the real-time automatic reasoning and delivery, were done with the nm2[12] ShapeShifting Media Technology tools[13]. The software continuously analysed viewers' text messages and automatically directed the choice of events, the mood, and the pace of the narrative, by choosing how the video and audio clips and graphics objects should be assembled. The text messages selected for inclusion in the narration had to be, and were, moderated by a human operator.

Accidental Lovers is constructed as a superimposition of voiceovers on video clips, with very little lip-sync material. In order to produce constantly reusable moving images within the story structure, the original storyboards and shooting plan were based on very theatre-like blocking of characters for

[10] Tykwer, T. (dir.) (1998) Lola rennt. 1998. Movie. X-Filme Creative Pool, Germany.

[11] Ramis, H. (dir.) (1993). Groundhog Day. Movie. Columbia Pictures Corporation, USA.

[12] Stollenmeyer, P. etc. (2007) nm2 - new millennium, new media EU FP6 project web site. *http://www.ist-nm2.org* (June 24, 2014).

the camera, together with location clarifying large shots, emotion carrying close-ups and associative, symbolic images in between. The working premise was that the character's point of view in each situation would be carried by voiceovers (Juulia's or Roope's thoughts within each scene).

Cumulatively, during the overall 12 broadcasts, *Accidental Lovers* attained over a million television viewers, while each episode audience number varied between 40–100 thousand viewers, with the peak audience groups being 20+ men and 60+ women. This fulfilled the goal of breaking the generation and genre gaps. The participating viewers sent almost three thousand text messages to the show: advice to the characters, opinions about them, comments about love and even their own alternate fantasy scenes.

The Accidental Lovers concept won the CyberPitch award in the Banff International Television Festival 2003 and was the first university production to ever be nominated for the Banff 2007 World Television Festival Awards (in Interactive Enhancement category) within its twenty-eight years of history.

An essential element of any art is risk. If you don't take a risk then how are you going to make something really beautiful, that hasn't been seen before?
-Francis Ford Coppola,
Interview by Ariston Anderson for 99U.com (2013)

TURING MACHINE QUINTET

In 2008-12, Crucible Studio participated in the 2012 centenary celebration of the life and work of Alan Turing (1912-1954) by preparing five productions in his honour. The World War II code-breaker, considered one of the fathers of modern computing, made a significant and provocative contribution to the debate regarding artificial intelligence; whether it will ever be possible to say that a machine is conscious and can think.

As a person he was "an ordinary English homosexual atheist mathematician"[14]. For his wartime achievements he was awarded the OBE, Officer of The Most Excellent Order of the British Empire. In 1952, Turing was convicted of "acts of gross indecency" after admitting to a sexual relation-

[13] Ursu, M., Thomas, M., Kegel, I., Williams, D., Tuomola, M., Lindstedt, I., Wright, T., Leurdijk, A., Zsombori, V., Sussner, J., Myrestam, U. & Hall, N. (2008) Interactive TV Narratives: Opportunities, Progress and Challenges. *ACM Transactions on Multimedia Computing, Communications, and Applications*. Vol. 4, Issue 4, Article No. 5.

[14] Hodges, A. (1983). Alan Turing: The Enigma. Simon and Schuster, New York.

ship with a man in Manchester. He was placed on probation and required to undergo hormone therapy to achieve temporary chemical castration. The therapy caused Turing's body to develop female forms, and the conviction resulted in his security clearance being revoked.

He died after eating an apple laced with cyanide in 1954. The death was ruled a suicide.

Turing Machine Opera & *Turing Enigma*

In 2008, Skaala Opera in Helsinki premiered with the *Turing Machine*[15] multimedia opera, which was comprised mainly of new electronic music and real-time sampling of old and new material. Crucible Studio's visiting artist Merja Nieminen produced the 3D visualisation and digital scenography.

To enhance the multimedia experience, Nieminen's visual work was further reused in writer-researcher Leena Saarinen's *Turing Enigma* online chatter-bot (programmed by Markus Norrena) that was made available in the lobby for audience to chat with in-between the performance times. In *Turing Enigma* Alan Turing's spirit has infiltrated the World War II encrypting device *Enigma*, which Turing devised to successfully crack an "unbreakable" German code. The interactor can play the role of the cryptologist and engage in discussions with Alan Turing's spirit. The artificial character can recognize words and sentences from text typed-in by users and then reply accordingly with text and by "spitting out" various 3D-animated objects and operatic sounds out of the Enigma machine.

The chatter-bot is still online and the opera is touring internationally. It has been performed, for instance, as one of the main events of the 24th International Congress of History of Science, Technology and Medicine (iCHSTM 2013) in the Capitol Theatre of Manchester Metropolitan University.

Turing Impact & Alan Online

The *Turing Machine* quintet also contained a non-linear narrative HD documentary workshop for professionals and advanced students, lead by post-production expert Severi Glanville and cinematographer Daniel Lindholm. The workshop investigated procedural storytelling structures for making documentaries on the theme "Impact of Alan Turing and the digital computer."

Outcomes of the workshop were four short HD movies, which have been available for viewing in connection with the *Alan01* installation[16] and are still online on the installation project web site, *AlanOnline* by designer-researcher Teemu Korpilahti[17].

Alan01

The touring *Alan01* interactive installation by Crucible Studio's visiting artist (2009–2012) Jaakko Pesonen, based on Saarinen's[18] script, investigates further associational storytelling and interaction structures, highlighting the patterns of human-machine communication. The work's primary themes are derived from Turing's ideas of machine-based consciousness and prosecution for having been homosexual. The themes were selected to acknowledge all the people past, present and coming, who were, are and will be treated unjustly in our societies, while Turing's own ideas of computable consciousness serve as a model for interaction design as an artistic expression.

The interactor can "talk" to *Alan01* by dialing symbols that relate to Alan Turing's life and era. The symbol combinations are flashed by light codes to a media retrieval system. *Alan01* deciphers the symbols through a collage of animations projected on the busts of Alan (actor Hannu Kivioja), screened videos and audio feedback including speech synthesis.

Alan01's minimalistic black-white-and-red colour scheme, which continues through to the user interface and screening of videos and texts, seeks to transport the user back to the time of Alan Turing – and beyond. The sparse use of red emphasizes the themes of the installation: anger, blood, pain, guilt, sin, passion, warning, sacrifice and courage.

Alan01 has been exhibited, for instance, in the ACM Multimedia 2010 Interactive Art Program at the Palazzo Medici-Riccardi in Florence, Italy, October–November 2010, and in the *Northern Souls* exhibition of the Space Station Sixty-Five gallery in London, UK, March–May 2014.

[15] *Turing Machine* Opera (2008, dir. Janne Lehmusvuo). libretto (based on Jaakkola's play Turing) by Taina Seitovirta, composition by Eeppi Ursin & Visa Oscar. Opera Skaala & Crucible Studio, Media Lab, University of Art and Design, Helsinki, Finland.

[16] Pesonen, J (dir.), Korpilahti, T., Nieminen, M., Saarinen, L. Tuomola, M. et al. (2010) *Alan01*. Interactive installation. Crucible Studio at Media Lab Helsinki, Aalto University School of Art and Design.

[17] Korpilahti, T. et al. (2009). *AlanOnline: http://mlab.taik.fi/alanonline/* (25.6.2013).

[18] Saarinen, Leena et al. (2008). *Turing Enigma at http://fullhouse.uiah.fi/turingenigma/* (25.6.2014).

At Hand

Another Media Art production that has been in constant development during recent years is *At Hand* by Crucible Studio associated artist-researcher Heidi Tikka[19].

The project explored the experiential and expressive possibilities of touch interaction via an orchestration of intimate close-ups of gesturing hands and the dynamics of various end media.

In 2010, *At Hand* was produced as an interactive piece for touch screens in public space for the Media Facades 2010 Helsinki festival in collaboration with m-cult association for new media culture and MultiTouch Ltd. After e.g. development for multiple metro station screens in the *City Sets* exhibition in Paris May–August 2012, the work found a new multiple screen, nuanced interaction version in Tikka's private exhibition *Kosketusetäisyys – Within reach* in the Sculptor gallery, Helsinki, January 2014.

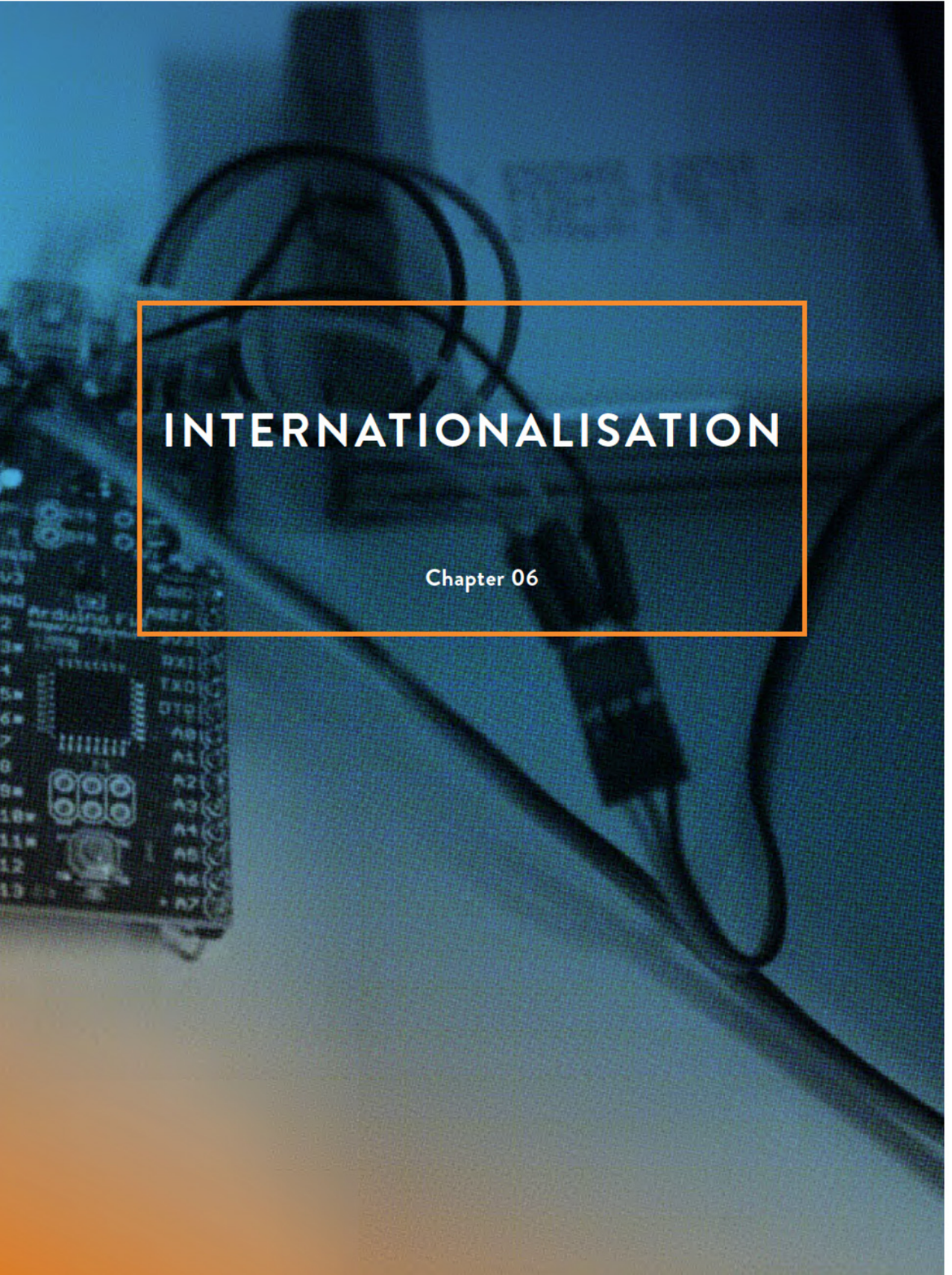
Harri Mäcklin of the *Helsingin Sanomat* newspaper reviewed the exhibition 12 Jan 2014:

> *Heidi Tikka's exhibition... feels a very fresh start of the year. Her works particularly need to be touched, not just looked at. They break the distance between the viewer and the artwork, and downright demand for physical intimacy.*
>
> *We work in the dark — we do what we can — we give what we have. Our doubt is our passion and our passion is our task. The rest is the madness of art.*
>
> - Henry James, The Middle Years (1893)

[19] Tikka, H. (2010 - 14). At Hand. Installation variations. "Selected artwork" at http://heiditikka.com (25.6.2014).

ACKNOWLEDGEMENTS

This introduction to Crucible Studio's artistic productions has used a lot of previous writing, particularly from production descriptions. At least the following artists, producers and researchers in the studio projects have written or co-written with me the descriptions: Hanna Harris, Aija Kelly, Riikka Pelo, Jaakko Pesonen, Leena Saarinen, Tea Stolt, Maureen Thomas, Heidi Tikka, Marian Ursu & Kati Åberg. Thank You and All the Crucible Studio Collaborators over the years for marvellous moments, Art and Research!



INTERNATIONALISATION

Chapter 06

One proof of the international nature of the Media Lab is the fact that the working language is English and has been for a good while. English is not limited to certain courses or to specific researchers, but is used constantly, everywhere in the lab.

This wasn't necessarily the intention when the Lab was established. The selection of English as the working language was based on the realities of teaching.

"We had more and more foreign students and pretty soon we came to the point where teaching had to be arranged in English. We didn't have a strategy to start using English, but we did make a conscious choice of making this a place where non-Finnish speakers can study," Kari-Hans Kommonen says.

Indeed, there was no single point in time during which someone said 'Hey, let's make Media Lab Helsinki international.' Yet that is what it's most certainly been for two decades. MA and doctoral students of the Lab represent 30 different nationalities — even more, if you include the staff.

"MA AND DOCTORAL STUDENTS OF THE LAB REPRESENT 30 DIFFERENT NATIONALITIES"

The origins of this development can be traced back to the 1990s and the Media Lab's participation in a project called EMMA, the European Media Masters Program. EMMA was a consortium of nine institutions from seven European conntries, the goal of which was to develop best practices for building a new media studies cnrriculum. The group included mostly arts and design institntions, but also more technologically oriented ones.

"Inbuilt into EMMA was the idea of student exchange. It had to be a part of it, as we were funded by EU MEDIA II programme," Philip Dean recalls.

As these were the early years of the MA program, and Media Lab Helsinki was one of the first university departments in Europe to offer a degree in new media, a lot of pioneering work was required. The Lab pitched the idea of a master's level education that would be about coping with the change brought about by digitalization and the new media industries. The EU fnnding spanned a number of years, thus giving the Lab much needed support in developing their cnrriculnm. It was during those years that the real pnsh happened.

"The Lab became very international automatically. We didn't even question the fact. A part of the deal was that we had to publish our calls for new students internationally. We got good and efficient marketing through EMMA, so we had a lot of foreign applicants. Then it went viral. If you're good, the word spreads," Dean says.

Pipsa Asiala tutors the students with their MA theses, so she is used to working with students from all around the world. However things don't always go without a hitch and misinterpreting situations is easy. During the years of working within a multicultural environment, she feels she has gained a deeper understanding of how to connect with people from different backgrounds. As a concrete example of that, back when Gangnam Style by the South Korean artist Psy was a gigantic hit, the Media Lab had some students from South Korea. Rasmus Vuori recalls conversations about the nature of the song with the students.

"THE LAB BECAME VERY INTERNATIONAL AUTOMATICALLY"

"What was it really about? What did it look like to the Koreans? Was it merely a thing that was happening outside South Korea? The conversation sprung forth naturally, which I can't imagine happening if we were a purely Finnish unit," Vuori says.

A truly international student core means that there's almost always a native person present to explain what certain phenomena look like from the inside. It also forces people to face their prejudices, because it's impossible to treat people as stereotypes when you're in constant contact with people from all around the world.

The staff is also very international. So how did some of them end up at Media Lab Helsinki? Nuno Correia took the scenic route.

Correia is of a generation that didn't get a formal education in new media, because none was available. He finished his bachelor's degree in 1994 and had always been fascinated with digital media, but not until the advent of the web and the possibilities it brought along, did it seem possible to build a career out of it.

"My background is in business studies, management to be exact. I slowly taught myself about new media and became fascinated with its possibilities. I learned programming, editing, all these kinds of things," Correia says.

In the mid-nineties he was confident enough of his skill set to switch careers from management to new media. Correia began teaching new media and doing other freelance projects in the field.

"I was always very much into art. New media became the unifying element between my art, teaching, and freelance activities. As my teaching became more relevant and important to me, I felt the need to further develop my academic side, to have a more formal education in new media," he says.

His master's degree was a hybrid of management and new media, but he was already thinking about continuing towards a doctoral degree. Correia started looking online for new media doctoral programs that would fulfil his criteria of language, quality of teaching, reasonable cost of education and living, the appeal of the country and city the university was located within and its proximity to Portugal.

"FOR ME, THAT BECAME THE MOMENT WHEN THINGS CLICKED. I DIDN'T HAVE TO BE CONCERNED ABOUT FITTING IN HERE"

"I ended up with four universities on my shortlist: Barcelona, Oslo, Malmö, and Helsinki. I visited my top two choices and became convinced that Helsinki was the place for me," he says.

Why Media Lab Helsinki? Partly it was because of how the Lab viewed the things Correia had done before. One of the other universities had a stronger emphasis on IT and they thought that he didn't have enough IT credentials to pull off a doctoral dissertation there. They would have offered him the place, but also would have required him to go through a preparatory process before starting on the dissertation.

"My diverse background seemed to be a handicap to them. When I came here, I wanted to announce my history straight away. The person hosting me here told me she was quite interested in it, and what was a handicap in one place became an advantage," Correia says.

"For me, that became the moment when things clicked. I didn't have to be concerned about fitting in here."

Lily Díaz came to study at Media Lab Helsinki because there was no other place that would've let her study what she wanted to study. She wanted to

do a doctoral degree in art, but it was difficult to find a suitable programme in the United States in 1994.

The few available options were too far off-base. Harvard had a doctoral programme in design, but that was very much architecture-oriented. The University of North Carolina emphasized industrial design, as did the programme at Illinois Institute of Technology.

She could have opted for a doctoral degree in journalism or communications, but that wasn't exactly the kind of thing she was searching for either. In Media Lab Helsinki she found the right fit.

Internationalization is one of the many buzzwords of the Finnish university sector, and the Media Lab has been on the forefront of the development. It's one of the most international units in all of Aalto Arts, and Aalto Arts [pre- 2010 as the University of Art & Design Helsinki] has been the most international university in Finland.

Nowadays Aalto Arts is in many ways a very international school, but back when Andrea Botero started her studies at TAIK, it wasn't the norm. Media Lab Helsinki, on the other hand, already was quite unique as a truly international department. The working language was English and everyone was content with that.

"I appreciate that as a foreigner," she says.

Back in the days of TAIK, many of the other departments of the university had fewer courses taught in English, which meant many of the exchange students — industrial designers, art educators, and so on — took part in courses organized by the Media Lab. So the more international students that hung around the Lab, the easier it was for newcomers to join them there.

The one downside of working with international students that Rasmus Vuori, head of the MA in New Media Programme, can think of is that he's seen how cold and downright racist the Finnish system can sometimes appear.

"If you think about the trouble these students go through, especially if they come from a distant country, clearing the Finnish bureaucracy isn't always that easy," he says.

Given that university education is free in Finland, you could argue that educating a lot of international students doesn't make a lot of sense when

considered from a point of view based on return on investment. The lab's director, Philip Dean, disagrees, partly because the years of biggest international growth coincided with the years the industry, especially Nokia, were also growing and needed more international employees.

"I've argued that the international students either develop a continuing relationship with Finland, stay here to work, or are in a relationship with a Finn. I think in some earlier years we've had more babies born to our community than graduates," he says.

"It was never a question of 'do we want foreign students here?' of course we did. And it's clear that we embrace the situation," says Kari-Hans Kommonen.

The arrangement has definitely benefitted the Media Lab. As the Lab only offers Masters and doctoral programmes and the number of people applying for MA studies is smaller than those looking for a Bachelor programme, the process is more manageable. There have always been four to five times more applicants than the programmes accommodate, so the Lab has been able to pick the best applicants, irrespective of their nationality.

"IT WAS NEVER A QUESTION OF 'DO WE WANT FOREIGN STUDENTS HERE?' OF COURSE WE DID"

"I worry about the time when our teaching might no longer be free. How will that affect the people applying to study at the Media Lab? Now we have the world's most talented applicants and we choose the best of the best," Pipsa Asiala says.

She wonders whether fees would result in a drop in the number of applicants or the quality of the students. Media Lab Helsinki has a good international reputation, which means that marketing has been taking care of itself for years.

"Every student that graduates is our calling card," Asiala says.

OPENNESS

Chapter 07

Wikipedia, the user-editable encyclopaedia, is surely the most prominent example of what can happen when technology is used to lower the barriers of entry and to let people collaborate freely; in others words, goes to show the potential of what happens when openness is the rule.

Wikipedia is run by the Wikimedia Foundation, on whose Advisory Board Teemu Leinonen sits, thanks to the kind of work he's been doing at the Media Lab.

"Open activism fits in nicely with onr other activities," he explains.

Leinonen met Jimmy Wales, the co-founder of Wikipedia and a board member of Wikimedia Fonndation in 2005. Back then Wikipedia wasn't qnite the mammoth we know it as today, but it was already a formidable undertaking and quite certainly the world's best known wiki. Wikis are user-editable web pnblications, which meant that they aligned neatly with Leinonen's ideas about ednca tion, learning, and the read-write web.

"Interactivity isn't just about clicking on something, but argnmentation and engaging in a dialogue with others. That's how people create meaning," he explains.

In addition to being an early wiki user — 'wiki-civilized', as he puts it — Leinonen had signed np to be a Wikipedia contributor a few years before meeting Jimmy Wales.

Later, in 2006, Leinonen met Erik Möller, who has since become the Deputy Director of the Wikimedia Foundation. Leinonen mentioned a project called MobilED he was just starting to work on.

The idea behind it was to make information available to people withont compnters and expensive phones. You'd send a question to the MobilED phone number (e.g. 'Helsinki', 'sanitation', 'millet') as an SMS, the system would look up the answer on Wikipedia, call back the sender's number and read ont the article nsing a text-to-speech system. Möller was intrigued by the idea, even though MobilED wasn't yet even a prototype.

There's an emphasis in the mission statement of Wikimedia that pleases Leinonen:

> The mission of the Wikimedia Foundation is to empower and engage people aronnd the world to collect and develop educational content nnder a free license or in the pnblic domain, and to dissemi-

> nate it effectively and globally. In collaboration with a network of chapters, the Foundation provides the essential infrastructure and an organizational framework for the support and development of multilingual wiki projects and other endeavors which serve this mission. The Foundation will make and keep useful information from its projects available on the Internet free of charge, in perpetuity.

"You'll see that it mentions 'educational material'. It defines the editorial line of Wikipedia and lets us discuss the relevance of various articles from the perspective of education," Leinonen says.

This sits well with his self-professed, old-fashioned concept of civilisation: A civilized nation will make wiser decisions than a less civilized one.

The way that Teemu Leinonen interprets the role of openness at the Lab is that the Lab is not a pure political or social sciences department, but neither is it a pure research and development laboratory that produces devices without thinking about their effects on the society at large.

In any case, there are many good reasons to work in as open a fashion as possible. One of them is scale: the spreading of proprietary solutions, like a commercial computer program or online service, is limited by many factors, especially once you start thinking of a global audience.

Another reason is agency. Commercial applications rarely offer meaningful ways of contributing to their ideology, design, or practice, but open or free applications — both in the sense of not having a cost and being free to use for whatever purposes — do.

"THE ACADEMIC IDEALS OF THE LAB ARE A GOOD MATCH FOR OPENNESS"

The benefits of open access are also self-evident when it comes to education. As peer-reviewed research is made increasingly available in open journals the situation of teachers and students is improved.

Openness has value in other areas of society, too. As an example Leinonen mentions Education For All or EFA, which is a global movement led by UNESCO. EFA goes back to the year 2010, when over a thousand participants from 164 countries adopted The Dakar Framework for Action, "Education for All: Meeting our Collective Commitments."

The academic ideals of the Lab are a good match for openness, so it's not a great surprise that the ideals of an open society are also reflected in the extracurricular activities of the faculty. One example of that are Creative Commons licenses, aka the various open licenses that can be used to share different kinds of content: images, text, video, audio, and so on.

If you've ever copied text from a Wikipedia article, you've come into contact with Creative Commons licenses. The Lab is involved in the administration of Finnish versions of the licenses, coordinating the translations and updates between versions.

"MANY NEW MEDIA ARTISTS ARE VERY GENEROUS ABOUT SHARING THEIR WORK AND THE TOOLS USED TO MAKE THEM"

Is that research or maybe activism? Teemu Leinonen sees no need to draw a clear line between the two, because in carrying out their research and education mission, Finnish universities must 'interact with the surrounding society and strengthen the impact of research findings and artistic activities on society,' as the official phrasing goes.

Openness isn't limited to academic circles, as Nuno Correia has noticed during his artistic practice. Many new media artists are very generous about sharing their work and the tools used to make them.

"There's a kind of karmic element to it. It's a feedback loop that increases robustness through commenting and contributing. [It's] also a naive, idealistic, beautiful thing," he says.

It can also make business sense, because if you become known as a skilled toolmaker, it can generate invitations to hold workshops or give talks.

"The media art circuit is very open in the sense that these things can reinforce your image as an artist," Correia says.

The palpable benefits of openness can be seen in the way Koray Tahiroğlu, leader of Sound and Physical Interaction (SOPI) research group, uses open source software in his teaching. The reasons are both practical and philosophical.

"We didn't want to focus on something that the students couldn't access because it was commercial or closed source," he says.

One perk of using open (software) tools is that it is easier to modify them. Hacking a small, self-contained program is much easier than tackling a hugely complex program like Processing or Pure Data, which are also used at the Media Lab.

The key thing is not to get hung up on the tools but focus on the goals, which is why in his own teaching Tahiroğlu uses only a few software kits that are easy to learn, so that the students can spend their time on interaction design instead of getting to know all the tools.

The Media Lab opts to use some commercial software and takes care of the licensing costs, but if these programs were used more widely, the students would be limited to using them on the Lab's computers and couldn't use them at home, or at the very least would have to pay for the privilege.

"We also need to be aware of any good commercial software that's out there, that becomes a necessity for the students in the workplace. The fact that much of the software we use is actually free and non-commercial is really important. Because then the students can download it and practice with it," Nuno Correia says.

Then again not everything is automatically assumed to be beneficial, just because it happens to bring together computing, openness, and learning. For example, given that the Media Lab has been on the forefront of computer-mediated teaching, you might assume that the current wave of enthusiasm about MOOCs or Massive Online Open Courses would be shared by the staff.

It's more complicated than that. Teemu Leinonen understands the usual criticism pointed at MOOCs, namely that they have a high percentage of dropouts and that most current MOOC students aren't underprivileged kids from the third world, but people who already have a degree from a university in their back pocket.

Leinonen has signed up for a course or two on Coursera, one of the leading MOOC providers, just to see how they work.

"If 160,000 people sign up and 20 percent of them finish the course, isn't that a rather decent number?" he asks.

Leinonen tells of a researcher who compared studying to running the marathon. Sure you can do it solo, but for some weird reason people go

run the New York City Marathon with tens of thousands of other runners.

"That's food for thought. Maybe MOOCs should be turned into more of a happening, and that might draw people in. You know, you could read all these articles by yourself or run 42 kilometres, but wouldn't you rather do it in the company of others?", he says.

Another area with tremendous potential but equal risks is digital commons. It's a subject that's important to Kari-Hans Kommonen. Privatizing and monopolizing parts of the cultural commons that have been built up during the span of human civilization is a rather recent development, but one that now seems commonplace.

"That reduces the shared pool of cultural commons, which infers that we have to go in the opposite direction, to strengthen cultural commons, and make all new innovations available to everybody. This is where digital media plays a central role," Kommonen says.

The questions that arise from software becoming the central building block of the modern world are such as: Who owns the rights to it? Who can use it? To pick an analogy from the physical world, what would happen if cinder blocks were privatized and building structures made out of them required a license?

"We at the Lab should be using our influence so that everybody understands the value of the commons. It's my hope we could be even more involved in initiatives that strengthen the commons and I hope that working in this community of ours helps people promote that," he says.

Even though Kommonen thinks a complete overhaul of the international intellectual property rights system — i.e. patents — is needed, he sees the benefits that digital commons could bring even without it.

"The more shared value we provide, the more competition improves. If governments decided to start improving cultural commons instead of subsidizing major corporations, that might result in a power shift."

Growing pains are to be expected, and given that the Media Lab works together with various companies, it's clear that not every research project can be fully transparent. Sometimes the results have direct commercial applications, and in those cases one must compare the benefits of an open

process with freely shareable results to those of a somewhat closed project.

Not so long ago, the whole concept of open source was very new and often not widely understood. An early example of this is the Innovative Technologies for Collaborative Learning and Knowledge Building (ITCOLE) project, which involved lots of legal wrangling.

The ITCOLE project was somewhat of a pioneering effort both for the Media Lab but also within the EU's Framework program for ICT. At that time the commission had very little experience of open source development and the related software licenses.

The project ran from 2001 to 2003 and was devised and coordinated by the Media Lab and developed with several partners around Europe. It was all very new to TAIK and in fact it was the first framework program project coordinated by the university.

Doing pioneering work in undertaking European projects while being situated in a school that didn't have previous experience in the matter was at times a heavy enterprise.

"There was a lot of learning by doing," Philip Dean recalls.

"WHEN WORKING IN AN OPEN WAY, THE BIGGEST CULTURE CLASHES COME FROM PROJECTS WITH OUTSIDE FUNDING"

When working in an open way, the biggest culture clashes come from projects with outside funding, Perttu Hämäläinen says. He works with a lot of game companies, where the usual working method is to keep everything under tabs until there's a polished product that can be revealed to the world. Maybe it's a way of minimizing competition or maximizing impact, but unfortunately the same phenomena can be seen in research.

"Publications are used to measure your output, and being the first one to come out with something gives a boost to your career. The incentives are rigged towards keeping things secret," Hämäläinen says.

For example, if a researcher manages to put together a good data set, why would she let others see it, if the intention is to write a series of papers and then, hopefully, turn them into a book? Hämäläinen commends the open-access peer reviewed scientific journal PLOS ONE for demanding that all relevant data and source code be published in concert with the article.

"That's the kind of thing open access needs. It won't spring forth by itself," he says.

Open approaches are being adopted more and more in the business world and in public government. Kari-Hans Kommonen believes it's entirely possible that an open source approach will be one of the factors that lead to a new model of doing business.

He gives an example from the world of software companies. Even nowadays no sensible company will develop and sell a content-management system — a system used for web publishing — of their own, but rather sell a service that's built on open source software.

"It's impossible for a single company to compete with the speed of open source software development," Kommonen says.

What's unclear is how long the transformation towards using open source might take. Also because of Edward Snowden's leaks, people are starting to think of open source as the more trustworthy alternative. It's becoming more and more difficult to sell a proprietary solution and just ask the clients to trust the seller's benevolence.

"Maybe that'll speed up the change during the next five years," Kommonen says.

Still, a big push for openness is needed in the public sector, where a lot of software development occurs. There are frequent news reports about government-funded software development programs that have vastly overrun their budgets and systems that don't work the way they're supposed to.

By comparison, there's the Estonian example of building national IT infrastructure in a much more cost-effective way than in Finland, as well as some solidly designed Danish systems, which make many Finnish systems pale in comparison.

Philip Dean believes that technical issues often take the upper hand and leave things like ethics, accessibility, and openness in second place. The problems can stem from official tendering processes and the areas of expertise of the officials making the decisions.

Still, there are clear signs of change. For example Forum Virium Helsinki, a company in which several Media Lab alumni have ended up working,

facilitates collaboration between the City of Helsinki and companies and organizations to tackle the development of digital services.

"I think it's a very forward-thinking organization that tries to help the city and its companies to thrive, and within their ethos openness is a very big issue," Dean says.

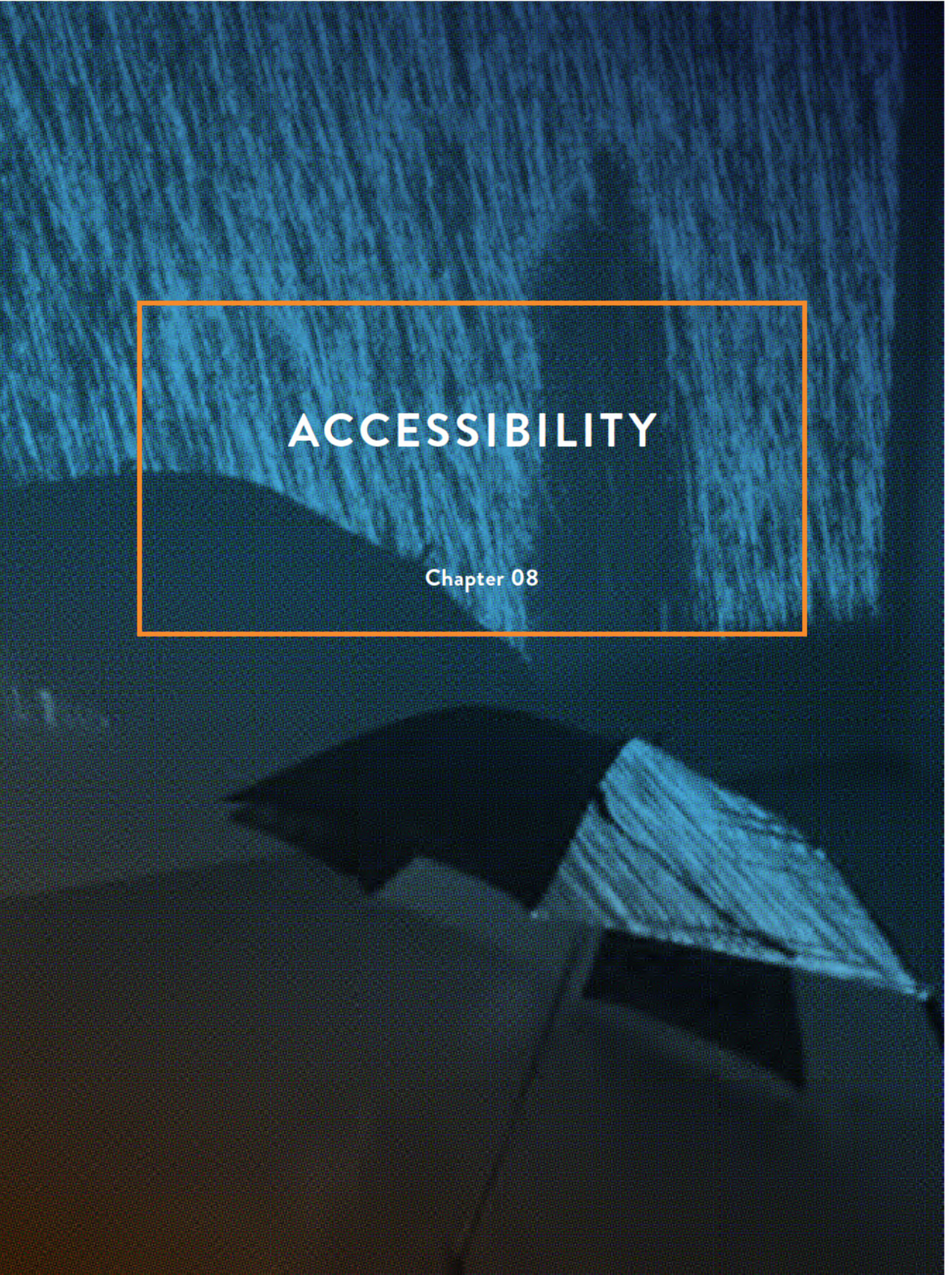
The work Forum Virium Helsinki has done demonstrates the kinds of benefits that can be achieved by using open data and open APIs. Forum Virium is one of the main organizers of the annual Apps4Finland competition in which software developers from all over Finland come up with innovative ways of using various kinds of open data the public sector has made available.

"There's a strong community that's ready to revolutionize the field, but will the public sector answer the call?", Pekka Koponen of Forum Virium asks.

At this point, even events like Apps4Finland, held once a year, have had a big influence, but there are many unanswered questions about the whole open data model and how that can be turned into a business. It's still mainly a hobby for most developers, so without sustainable business models it might fizzle out.

"What I find great about open data is that the questions are being answered by doing," Koponen says.

This is an approach that the Media Lab also values.



ACCESSIBILITY

Chapter 08

What makes for great design? You could argue that the larger and more varied the group of people it can serve, the more successful it is. Without accessibility, even the superficially most impressive pieces of design can be rendered useless.

Between 1998 and 2000, Marjo Mäenpää was involved in a Media Lab project for The National Mnsenm of Finland. The task was to create five different multimedia kiosks with touch screens to describe the different collections of the museum.

It was the first big digital media project that the museum had ever ordered and brought together many of the themes Mäenpää still works with today.

"Usability was very important. A lot of user interface research was required. Touch screens were new, so what challenges did that pose? How do yon represent cnltnral heritage through the means of multimedia? How do yon involve the user?" Mäenpää lists.

"WITHOUT ACCESSIBILITY, EVEN THE SUPERFICIALLY MOST IMPRESSIVE PIECES OF DESIGN CAN BE RENDERED USELESS"

The group had long discussions with the museum abont their docnment archives and how to visnalize and dramatize all those data sets.

"It was also about bnilding trnst. We had to learn negotiation skills to reassnre the client. Organizations like The National Board of Antiqnities or The National Museum were wary of what ontsiders might do with their collections," Mäenpää says.

She has a personal connection with design for accessibility. Her eldest child was seriously ill and had to spend long times in isolation, where Mäenpää noticed the edncation possibilities provided by different media.

"My introdnction to accessibility came at a later age than for most students. It made me acutely aware of new media, its nsability and accessibility. I realized the possibilities of digital media, given that I was snrrounded by older people and people with disabilities," she says.

You don't have to understand, just accept.

That's a phrase Antti Raike, Senior Advisor in accessibility at Aalto University, likes becanse some of the connotations of acceptance can be misleading. Acceptance shouldn't be an optional attitnde you can adopt when necessary.

Accessibility became a kind of personal mission for Marjo Mäenpää. Together with Raike they established the Design for All network inside TAIK, where the Media Lab had a strong representation. Design for All incorporates various accessibility measures, such as basic usability of web pages and plain language. Mäenpää thinks the best students understood early on that accessibility didn't infer dumbing down but rather creating even smarter products.

"I taught a concept design course where Design for All was an important element. In the early years there was, at times, an air of, 'why do we have build stuff for disabled people, since they're only a minority.' Sometimes it seemed like young students had a strong urge to create something fancy and their default idea of a user was what they saw in the mirror — a young, media literate person," she says.

"THE BEST STUDENTS UNDERSTOOD EARLY ON THAT ACCESSIBILITY DIDN'T INFER DUMBING DOWN BUT RATHER CREATING EVEN SMARTER PRODUCTS"

"More and more people understand that there are many kinds of different users and they all should be served. That's been the attitude of the Lab's staff all along."

Antti Raike points out an example of universal design that's relevant right now. A lot of researchers are grappling with video annotation, but it's not only for the benefit of people with hearing disabilities, for having an hour-long lecture automatically transcribed makes it more searchable, and thus benefits everyone.

There are many stereotypes and cliches surrounding new media. One of them is that it's automatically youth-oriented, as if teenagers and university students are the only age group that could benefit from new technologies.

Philip Dean believes that there's a huge amount of work to do in seeing to the needs of an ageing population. Although much of new media has consisted of very glamorous stuff, now it's time to get used to the idea that it also has more down-to-earth uses.

"It means adhering more closely to the global challenges of aging and sustainability," Dean says.

"People's competence varies, and many tools out there do not work well with various levels of competence," says Kari-Hans Kommonen, Director of Arki research group.

When thought of this way, accessibility transforms into an aspect of user-oriented design. Even though accessibility as such hasn't been a main feature of the Media Lab's research or teaching, the general ethos of inclusivity is an important one, running through the education.

"WHEN THOUGHT OF THIS WAY, ACCESSIBILITY TRANSFORMS INTO AN ASPECT OF USER-ORIENTED DESIGN"

"The way these systems are being developed is that a new, more efficient system takes the place of an older and more cumbersome one that might, however, have been used by a larger variety of people. This often leads to some people being excluded altogether, and part of the problem is related to questions of accessibility," Kommonen says.

When it comes down to it, the major design questions have repercussions beyond the narrowest definitions of accessibility. For example, whenever infrastructure is re-designed and replaced with something new, it causes trouble with inclusivity. The right solution isn't to tweak the details but to take a broader view of the situation.

"It's a sad thing when people in some health, aging and wellbeing living lab start designing, for example, gesture-based user interfaces for the elderly. That's solving the problem from a completely wrong direction," Kommonen says.

Maybe instead of hiding human interaction behind technology or replacing it altogether with algorithms, we should be restructuring the society in such a manner that the value of people to people contact is recognized.

Here path dependence — the tendency to make decisions based on what's been done before as opposed to what's best — rears its ugly head. Finland is still a country built around heavy industry and agriculture, and the effects are visible everywhere from tax incentives to public funding methods and pension plans.

Kommonen thinks society should be redesigned in a way that makes it possible to offer services that treat people humanely and encourages producing food locally instead of shipping it from somewhere in Central

Asia. He also thinks technological solutions aren't the right way of solving these kinds of problems.

"The idea of automation taking over all jobs is a reflection of the kind of thinking that we need to evolve beyond, to better understand the relation of human life and technology."

Many members of the faculty have a story about how they started doing something else but ended up at the Lab. Pipsa Asiala, who now works as a producer and mentors MA theses at the Media Lab, started via her long-lasting love affair with cinema.

She started work at the Media Lab in 1999, when Media Centre Lume was being established in Arabianranta. The transition to a new work culture was a bit rocky at times. As a film producer, Asiala was used to working with large groups, where everything about the project at hand was constantly being discussed. At the Lab she sometimes felt people wanted to work alone.

Several student theses that Asiala has mentored at the Media Lab have dealt with accessibility. Suvi Kitunen, who went on to teach Digital Media at the University of Applied Sciences of Kymenlaakso, won an award at the 20th Anniversary conference of the Cumulus Association in 2010 for her thesis on deaf-specific websites. The Cumulus Association is a global network of art, design and media universities and colleges.

"Suvi wrote so beautifully about accessibility. Her thesis supervisor commented that she'd found a non-technical way of looking at it," Asiala says.

She believes that things tend to improve with each generation.

According to Antti Raike, the cultural shift is a sum of many parts.

"In the 1980s people thought sign language was a waste of time, and that it'd be better to learn to speak and read lips," he says.

Developments such as sign language teacher training, started at the University of Jyväskylä in 1998, coinciding with the spread of the internet, gave increased visibility to people with disabilities.

Raike says he only understood how big an effect a colleague's deafness can have after he got a hearing aid (cochlear implant, CI). Raike, who had become deaf as an adult, had gotten used to people pulling up a laptop and writing on it whenever they needed to communicate something with him. They were so familiar with computers and mediated communication that

turning the computer into an impromptu writing pad was a natural thing for them to do.

The rapid pace of technological development has changed a lot of things in ways that might now seem self-evident. Raike tells of a European Deaf Students Camp he attended in the late 1980s, where students from all around Europe complained about the lack of services at their universities. He saw a presentation about which he understood almost nothing, but saw how excited the person giving the presentation was.

The subject was e-mail.

The story of Raike's master's thesis illustrates what the difference between the Media Lab Helsinki and other, more traditional departments of TAIK was in the late 1990s.

Raike was majoring in movie producing and had still not completed his MA thesis. The Internet wasn't a part of his studies at all, but Raike was interested in transmitting video through the web. He asked around and found out that it was technologically possible, but just not feasible with the infrastructure available at the time.

Then Raike saw an article in Helsingin Sanomat. He still remembers the headline: Valiojoukko (The Elite). The story featured some of the first students of the Media Lab and talked about searching for ways to help teach aurally impaired students.

Raike looked up both the Media Lab and the students and got in touch with them. He met with Philip Dean and student Asta Raami and explained his idea about video on the net.

"Philip commended on my timing saying it's not possible yet, but might be possible next year. You should give it a try, if there's even a minuscule chance of success," Raike says.

From our current vantage point the response seems almost ridiculous. With over 100 hours of video being uploaded to YouTube every minute by people with all kinds of portable video recording devices, how could getting a few clips online cause so much trouble?

Raike saw a possibility to do something groundbreaking. Marjatta Levanto had written a book called Lasten Ateneum, a children's guide to the art museum, illustrated by Julia Vuori. Raike wondered, what if their mate-

rial would be translated to sign language and posted online for all to read? It would be an excellent opportunity to make material aimed at children even more accessible.

When he finished his thesis, the reaction was… interesting.

"My thesis mentor Kari Happonen was surprised: 'But it works!,' meaning he hadn't been completely sure it'd come together," Raike says.

And it wasn't just any thesis, as he later found out. In fact, Deaf Children's Ateneum was the first ever online content for deaf children in the world.

Yet only a few years later, kids started making remarks about the poor quality of the videos.

"It shows how fast the change was. Those were the very early moments before the new media explosion."

Still, the technology was never the most important thing, as the goal was communication, making knowledge more accessible.

After the museum project, Raike went on to create Elokuvantaju (Sense of Cinema), an online teaching material package about the basics of filmmaking. When he'd started the project in 1999, he wanted to create a resource that everybody could use, meaning it wouldn't be accessible only in the narrow sense.

He had created a network of people during his studies at the film department and knew he could draw on their resources. Later on the project grew to include even Spanish and Colombian Sign Language versions among others.

Elokuvantaju predates Wikipedia by a slim margin. Had Raike started the project a little later, it would've probably been a user-modifiable wiki, but as it stands, the content is more static. The upside is that even though he hasn't updated the project in quite a while, it's still usable and server logs show a steady stream of users accessing it from Finland and abroad.

Still, for some people having a popular, accessible teaching resource isn't enough. When Elokuvataju was a finalist in the Mindtrek competition, Raike was surprised by the jury's strongest criticism: There was no way to turn all this into euros.

"It was the flavour of the month back then, and suddenly everything had to have a way to be monetized," Raike says.

It really irritated him. Elokuvantaju was an open product from a university, aimed at all kinds of users. Raike shared the Media Lab's opinion that

concentrating on money too early on will stifle innovation, hold back the product development and result in people playing it safe. Money didn't belong in the picture, at least not yet.

Another way of looking at accessibility is to think of it as a feature of systems design on the level of the whole society. That's one of the traditions of Media Lab Helsinki: don't treat design only as something that focuses on the icons in the user interface of a digital gadget, but think of the whole, and combine that with interaction design.

Teemu Leinonen says that the Lab has a long tradition of participatory design, whereas elsewhere in Aalto University the preferred term is co-design. The difference isn't merely semantic, because participatory design carries with it traces of Scandinavian post-WWII democratic and egalitarian thinking: If the invasion of computers into the workplace involves everyone, then everybody has the right to take part in shaping their future.

If the goal of an ordinary design project was to deliver an improved product to the people, participatory design put the rights of the stakeholders in the limelight — the people deserve to have a say.

Leinonen tells an example of participatory design that the Lab is currently involved in: *Ach so!* The name sounds funny, but it has a serious purpose. It's a prototype of a workplace learning mobile app that construction workers can use to document their work and share information.

The way the app works is that the user shoots a video of the construction site on their phone and then annotates the video: 'Pay attention to this I-beam, we solved this problem by doing that', and so on. The annotations are categorized and location data is added to them.

Media Lab Helsinki designed the prototype and the mobile app, and technical partners took care of the IT infrastructure going on behind the scenes. It's an example of the kind of research that goes on at the Lab: functioning as the connective tissue between universities that study the particulars of pedagogical thinking and CS departments that know how to tackle the computing problems. The people at the Media Lab try to understand both sides and the needs of the user, and strive to bring all three together.

Another example of participatory design was a research project that Anna Keune, a graduate of the Lab, worked on. The goal of the project was to cre-

ate appropriate learning technology for Indian children. When the project started out, the people working on the project had their minds set on some kind of mobile device, but in the end they settled on a set of instructions in a pdf file that could be printed and folded into a booklet.

"It was a good design solution that didn't require the government to buy a $100 cellphone for every child," Leinonen says.

Accessibility is also about designing in an inclusive way. When designing interactions and interfaces, the designers needs to think of the obstacles users might face and then do their best to get rid of them.

"This is accessibility in its widest sense; removing barriers for access," says Nuno Correia.

Another way of thinking about accessibility is multimodality, which Correia is very familiar with through his research and art.

"THE DESIGNERS NEEDS TO THINK OF THE OBSTACLES USERS MIGHT FACE AND THEN DO THEIR BEST TO GET RID OF THEM"

"I'm dealing with essentially two means of sensorial expression, the auditory and the visual. One can reflect what's going on in the other, so if you've a disadvantage on the auditory side or the visual side, the other modality might help you fill in the gaps. There's a mutual reinforcement of vision and sound," he says.

Koray Tahiroğlu sees parallels between the development of the role of sound in movies and the way adding sound could function as an accessibility tool. Humans are visually oriented beings. Vision is our primary and most acute sense, so it's not surprising that so much of human-computer interaction is based on visual interfaces.

This means that when visual and aural elements are put together, sound has often played second fiddle. Early movies had no soundtracks, but they were almost always accompanied by live music. When synchronized recording of sound created talkies, the role of sound changed once again.

Visuals and audio aren't identical channels of delivering information, both have their strengths and weaknesses. Therefore, audio offers the means to bring a different structure, or a different channel, that people can use to access the design.

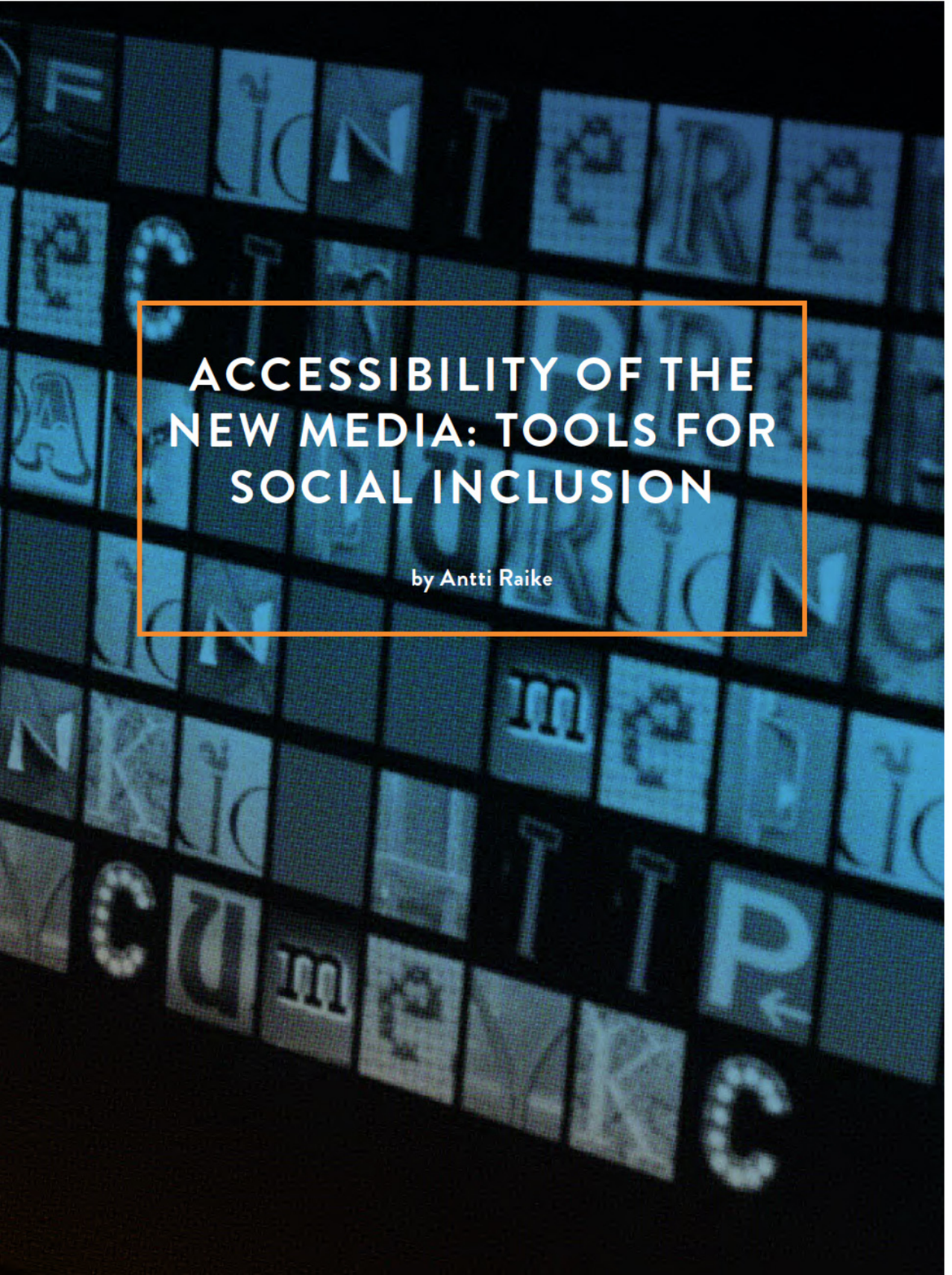
Another aspect of usability is cultural usability, which has always been well represented at the Media Lab.

"It reaches down to the work culture at the Lab, where the working language is English. There aren't that many native English speakers, but it's always been self-evident that everybody speaks English, so that everybody can share in the information," Marjo Mäenpää says.

The principle of sharing information trumped questions of linguistic competence.

In the same fashion, whenever Antti Raike was attending lectures, workshops and the like, there would also be a sign language interpreter present. It was a practical example of the efforts people at the Lab would take in order to accommodate people.

"It helped create an atmosphere of doing everything we can to help people participate," Marjo Mäenpää says.



ACCESSIBILITY OF THE NEW MEDIA: TOOLS FOR SOCIAL INCLUSION

by Antti Raike

It is just too tempting for me to compare our Aalto University's Media Lab to Hogwarts School of Witchcraft and Wizardry!

The saga of Harry Potter has gained success worldwide: Since the 1997 release of *Harry Potter and the Philosopher's Stone,* the book series by Joanne K. Rowling has sold more than four hundred million copies and has been translated into seventy languages and during the last twenty years Media Lab hasn't done bad, either. An important element of the Potter story is how the protagonist comes to find his mission and true friends.

Thus, the legitimacy of the school faculty is based on preparing Harry and his friends to meet the challenges of the real world; his peers and teachers help the novice deal with the trials he enconnters along the way and provide him with essential life experiences. Have we prepared onr graduates to contribute to society? Are they able to save a planet or at least the neighborhood? This essay introdnces some digital trends and practices that have the potential to increase the accessibility and flexibility of collaboration in society.

"DIGITAL TRENDS AND PRACTICES THAT HAVE THE POTENTIAL TO INCREASE THE ACCESSIBILITY AND FLEXIBILITY OF COLLABORATION IN SOCIETY"

These practices are sometimes exposed bnt, more typically, hidden in the Media Lab's curriculum. However, many of our graduates have fonnd their mission and have grown into practitioners who nse snstainable and inclnsive design methods in indnstry, business and academia.

The new and ever-evolving digital tools for information and commnnication technology (ICT) are an essential part of efforts to develop inclusive *social media* by following the principles of inclusive design, participatory design and co-design (ouly to name a few of the existing methods ntilised in the Media Lab).

I rely on the assnmption that in the Media Lab innovation is more of a collaborative and social process than an individual and mental one; we have understood that hnman learning presupposes a specific social nature and a process by which children grow into the intellectual life of those around them. Hnmans develop within a nnique sociocultural-technological

environment, where technology is inseparable from everything else; we are forever making clever innovations for survival and quite often just for fun.

Thus, successful learning awakens a variety of processes when a human interacts and collaborates with other people and peers in a given situation and environment. As Lev Vygotsky[1] explained, the child follows the adult's example and gradually develops the ability to do certain tasks without assistance. The "zone of proximal development" (ZPD) is the distance between the actual developmental level and the level of potential development, both of which are determined through problem solving under adult guidance or in collaboration with more capable peers.

Technology-enhanced environments, blended learning and social media provide tools and practices that facilitate the inclusive processes of collaborative learning that serve diverse populations. The technological innovations of the Media Lab projects resonate with the political agreement that all citizens should have equal rights in the communities to which they belong.

Moreover, even the needs and requirements of inclusion are under theoretical examination in Media Lab dissertations, and practical implementation of accessibility is easily available for our students and researchers due to well-networked faculty and staff. We have understood with Tim Berners-Lee that "The power of the Web is in its universality. Access by everyone regardless of disability is an essential aspect".

Therefore, cognitively and technologically Media Lab already lives in a society where the concept of "disability" is highly questionable and difficult to activate for societal and educational purposes. Thus, I will solely speak about accessible collaboration, not "social services" – Media Lab is a modern *enabling environment*.

Naturally we have done our homework and look for stimulating cross-disciplinary connections. Karl Popper and Vannevar Bush have contributed to our knowledge and culture by formulating conceptual tools for understanding our existence with technology and science.

The Open Society and Its Enemies[2] was published in 1945, as was Vannevar Bush's article "As We May Think[3]," in which he described a "memex" as a device "in which an individual stores all his books, records, and communications, and which is mechanized so that it may be consulted with exceeding speed and flexibility. It is an enlarged intimate supplement to his memory."

[1] Vygotsky, L. S. 1978. Problems of Method. In *Mind in Society: The Development of Higher Psychological Processes*, trans. M. Cole, 52–75. Cambridge, Mass.: Harvard University Press.

[2] Popper, K. 1945. *The Open Society and its* Enemies. London: Routledge and Kegan Paul.

[3] Bush, V. 1945. As We May Think. *Atlantic* (July). http://www.theatlantic.com/doc/194507/bush (accessed October 19, 2010).

This memex was the conceptual ancestor of the ARPANET, which in turn has evolved into the modern Internet, with technologies and protocols necessary for social media. However, Bush's vision works only in an open society such as that formulated by Popper; a totalitarian society would use a memex more likely as illustrated in the dystopia of *1984* by George Orwell.

According to Popper, science consists mainly of problem solving, like any other human activity. Scientists (and designers!) are "problem solvers" who begin with problems rather than with observations or facts, and the growth of human knowledge proceeds from our attempts to solve problems. These attempts involve the formulation of new theories that must go beyond existing knowledge and therefore require a leap of the imagination.

Creative imagination is essential in the formulation of any theory, and philosophy as an activity challenges our thinking and collaboration even in today's modern, highly specialized information society. The emergence of social media remind us that the Web continued to evolve after the "dot-com bust" of 2000–2002, and ideas and projects were born during the years when investors had given up on the Web.

Social media allows people to form active communities of practice, which in turn are capable of dissolving quickly in response to people's needs and interests; thus, learning also takes place within informal social groups with the aid of media flow rather than exclusively in formal educational institutions. The activities included in the social media as a ZPD reflect the learner's cultural background, which in turn strengthens cultural evolution and the *ratchet effect*.

Collaboration to Solve Problems

One of the challenges facing design education at every level is the lack of knowledge about the possibilities that modern social media offer to students and faculty. Even in post-industrial countries (minority world) ICT is attainable by only a few people and universities suffer from lack of collaboration and peer-to-peer learning.

However, this has not been an issue at the Media Lab. In the majority world, inclusive education is even worse: The vast majority of people with disabilities have no access to education of any kind. Clearly, we are not able to improve the status of disabled citizens unless the people with disabilities have access to social media and information networks.

The present global communication environment is but a shadow of what it could be if aided by open collaboration, open source, well-aimed proper funding, political determination, ICT and communities of practice. Thus, we should keep our mission clear and increase our capacity to make strategic and effective use of ICT understandable. This would help our students to intensify societal change after their graduation.

Skills for collaboration and community building are especially important when the diversity of people in all areas of society increases. This might lead to a situation of isolation and the difficulty of coping with requirements and a context designed according to the needs of the more homogenous majority.

"MEDIA LAB METHODOLOGY IS A PRACTICE FOR CREATING PROFESSIONALLY RELEVANT SKILLS"

One of the continuous challenges for all societies is to examine how abstract thinking and use of co-design and problem-based learning (PBL) methods can be made more accessible to people with disabilities. The successful achievement of Media Lab graduates might falter if graduates lack the collaborative skills they need to solve the complex and ill-defined problems of professional life.

In response to these challenges, "Media Lab methodology" is a practice for creating professionally relevant skills. Instead of a direct assimilation of information, students construct knowledge by solving problems with peers and partners in a community of practice.

The history of the Internet is replete with innovations that do not originate from companies, but from collaborating individuals, in which ideas spread through a grassroots network of early adopters and tinkerers before the moment when entrepreneurs and investors appeared to figure out how to make money from these ideas. Free and open-source software was there already in the 1970s, but corporations and manufacturers only 'got the message' in the late 1990s.

Over the years much innovation has taken place and now, in 2014, forty-three years after the first email, which twenty-two-year-old Tomlinson sent to himself in 1971, we are experiencing an era of social media utilized by three billion Internet users of all sorts[4]. We know that our students are smart enough to make technology do what they want rather than what its originator intended. They exercise "an idea or a gadget, pushing it past its current limits, reinventing it and eventually paving the way for entrepreneurs who figure out how to create mainstream versions of their novel ideas".

Linux (aka GNU/Linux), Homebrew Computer Club and Worldwide Web are interesting because they did not start with the profit motive. Rather, they started with interesting problems and with people who wanted to solve them; they were exercising technology to its fullest because exploring new ideas is fun[5].

However, we should never be satisfied with ICT and social media per se; the journey toward expertise progresses through convenient apportioning of novel requirements. Professionals with disabilities seldom have a true opportunity to affect any long-term decisions on ICT use. Thus, as educators we are misguided if we focus on tools and finances instead of the process of learning and the flow where a student figures out their personal mission: Our task is to collaborate with our students who construct their own identity, abilities and knowledge.

Nevertheless, the time between research-lab, cutting-edge prototypes and state-of-the-art consumer products and post-graduate practice is much shorter than at the beginning of the information age; it's even shorter than at the beginning of the Media Lab era.

The old simplicities of teaching and learning are changing because more and more people are able to collaborate and coordinate their actions in groups that cross both national and ethnic borders and physical boundaries. The lab's faculty has an opportunity to induce all of the stakeholders in question to enhance collaboration, to improve the Media Lab and to facilitate the inclusion of all people in society.

The threat is that scattered and diverse groups may upend the whole evidence based, formal education system or even abandon official instruction in favor of self-created informal material, using the very same social media.

However, the good news trumps the bad news due to the fact that both

[4] Internet Live Stats, 2014. *Internet Users*. Real Time Statistics Project. Worldometers & 7 Billion World. http://www.internetlivestats.com/internet-users/ (accessed June 2, 2014).

[5] Torvalds, L., and D. Diamond. 2001. *Just for Fun: The Story of an Accidental Revolutionary*. New York: HarperCollins.

opportunities and the threats to them rely on the growth of social media that are open and accessible to everyone and thus ideal for communal activity.

The philosopher's stone is not hidden in the Media Lab. It is simply the ability to understand this change, which offers tools to avoid the threats and enemies lurking in the shadows and instead take advantage of the great opportunities that the Media Lab offers for expanding and inclusive collaboration.

References

Bush, V. 1945. As We May Think. *Atlantic* (July). http://www.theatlantic.com/doc/194507/bush (accessed October 19, 2010).

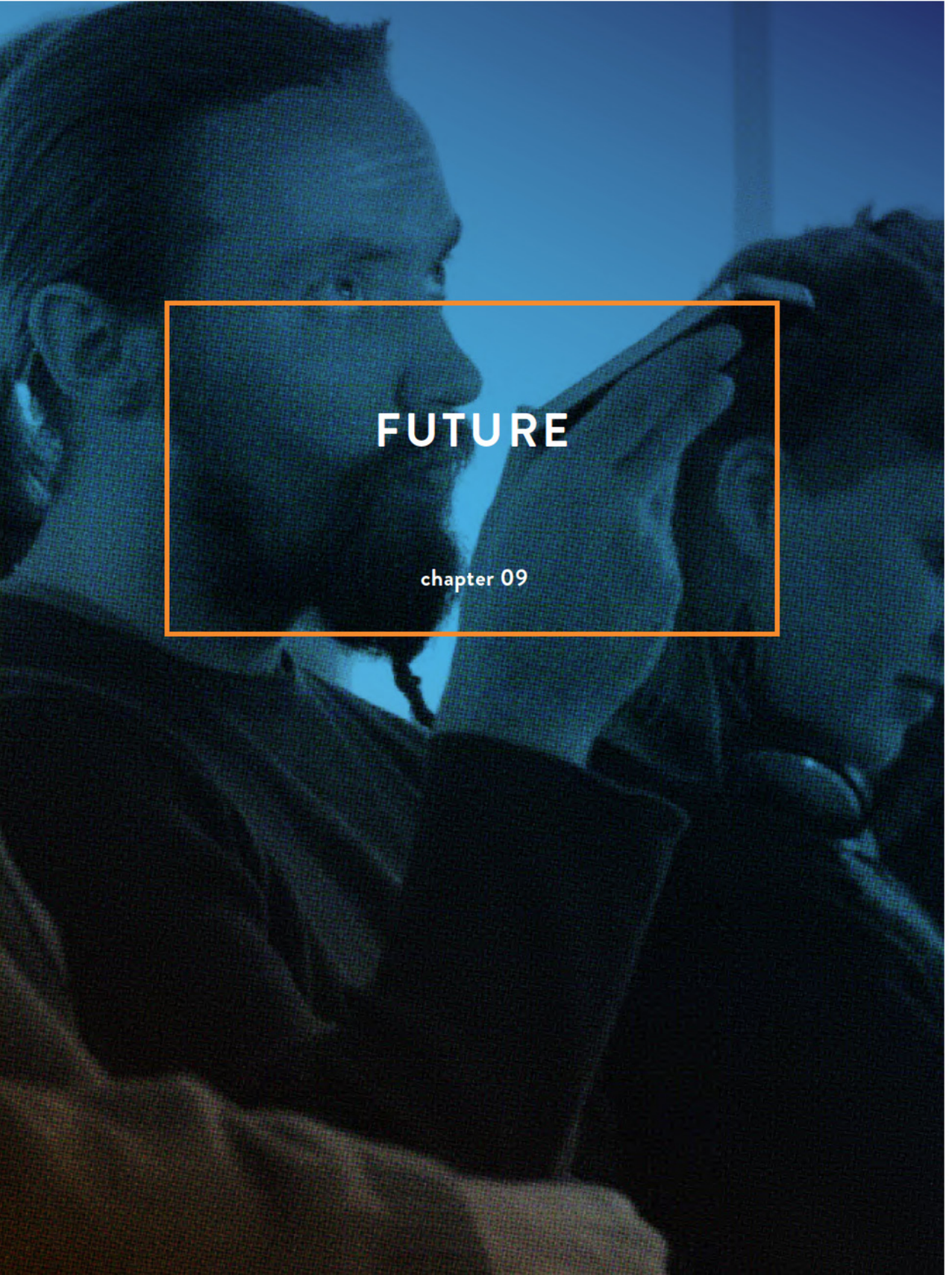
Cavalli-Sforza, L. L. 2001. *Genes, Peoples, and Languages.* London: Penguin Press Science.

O'Reilly, T. 2009. *O'Reilly Insights: Where Real Innovation Happens. Don't Look for the Gilded Road to Fortune. Look for Passion.* http://www.forbes.com/2009/02/03/innovation-tim-oreilly-technology-breakthroughs_0203oreilly.html (accessed October 19, 2010).

Raike, A. 2006. "Searching Knowledge: CinemaSense as a Case Study in Collaborative Production of a WWW Service in Two Universities." In K. Miesenberger, J. Klaus, W. Zagler, and A. Karshmer, eds., *Computers Helping People with Special Needs,* 568–74. Proceedings of the 10th International Conference on Computers Helping People (ICCHP), Linz, Austria, July 12–14. Lecture Notes in Computer Science. Berlin: Springer.

— — — , and K. Hakkarainen. 2009. "Concept Maps in the Design of an Accessible CinemaSense Service." *Art, Design, and Communication in Higher Education* 8(1): 27–55. doi: 10.1386/adche.8.1.27/1.

Tomasello, M. 2000. *The Cultural Origins of Human Cognition.* Cambridge, Mass.: Harvard University Press.



FUTURE

chapter 09

Some time ago, Teemu Leinonen had a nightmare.

"I was listening to presentations by Finnish education companies. I sit there listening and get the feeling that I've no idea what they're talking about. That turns into anxiousness. Are all these companies talking nonsense and should I just leave the room? It's not making any sense," he says.

"Then the insecurity strikes: maybe they're talking about things I just haven't heard of yet, but at the same time I worry it's all nonsense."

Apparently the stress of teaching new media can sometimes have an effect on your subconscious, even if you're a Professor of New Media.

The Red Queen Syndrome — run faster just to stay still — is familiar to many people, especially in new media. The future is always coming at us and we'll never catch up with it.

So what's next?

The world surrounding Media Lab Helsinki has changed. When the Lab started, Finland was slowly recovering from a recession. Nokia's success created an entire high-tech ecosystem. Now Nokia, once the brightest star of the Finnish corporate world and a partner in many Media Lab projects, has been sold off piecemeal and absorbed into Microsoft.

New devices are being brought to market at a breakneck speed, first as expensive one-offs or limited editions, but soon available to everyone.

"Design agendas have changed dramatically. Instead of being about studying to become a design guru, it's very much about how can design help solve the biggest problems the world is now facing. Non-private design schools especially have taken a very humanistic point of view," says Philip Dean.

"THE MEDIA LAB HAS TO MAINTAIN A DIVERSE APPROACH IN ORDER TO SOLVE PROBLEMS THAT HAVE ARISEN ONLY RECENTLY"

New individual technologies and media are popping up everywhere. Augmented reality is already making headway in devices like Google Glass, but the real breakthrough is still to come. What will happen once every surface can be used as a computer display? That's something that the media labs of the world will have to work out.

The Media Lab has to maintain a diverse approach in order to solve problems that have arisen only recently. There are also dilemmas. Game design

might be good business, but games can also have a negative effect on people. The current crop of so-called free to play or F2P games have been widely criticized for targeting underage players and finding various ways of enticing them to pay in order to progress in the game.

That's a thing Perttu Hämäläinen has been thinking about recently: should he open his mouth in public about what's happening with gaming companies? It's a tricky situation, because they are his main research partners and without them it would be easy to get confined to a remote corner of academia. Thus far he's been content to focus on more productive aspects of research instead of the psychology of monetization in free to play games.

"BEING THE FIRST TO DO SOMETHING ON AN EXPENSIVE PIECE OF NEW EQUIPMENT ISN'T NECESSARILY ALWAYS THE BEST OPTION"

Openness might well be one of the upcoming megatrends in Western societies in a post-Snowden era of NSA surveillance. Security and freedom will have to be balanced in every aspect of life, including design. As Evgeny Morozov demonstrated in his book The Net Delusion, the Internet hasn't been merely a force for democracy, for autocratic rulers know how to use it to their own ends too. It means that we need to learn how to design openness that is supportive of privacy and security.

The lab's director, Philip Dean, thinks we're in for a surprise: "You can't really see the future, even though you think you can."

He recently looked at predictions of the future from the 20th century. The self-driving car has been a trope in science fiction probably as long as there have been cars, yet Google and the automobile industry are making it a reality right now.

"But what happens if people hack into the systems that are guiding the automatic cars? I don't think I want to live in that world," Dean says.

Being the first to do something on an expensive piece of new equipment isn't necessarily always the best option. It might be wiser to wait for open alternatives that are more hackable and offer more opportunities for the user who doesn't want to be constrained by what the creators of the device have envisaged.

[1] Application Programming Interfaces are ways for computer programs to communicate with one another.

One encouraging sign of that is the spread of open APIs[1] — an essential part of open data — which makes it much easier to build new experiments, as you don't have to first reverse-engineer the inner workings of a machine or a program that was never designed for hacking.

The Media Lab has always been future-oriented. Part of the Lab's mission has been to play with the latest devices, hack and bend them and see what happens. Misuse can lead to discoveries and uses for technologies that were never envisioned. Motion sensing is a good example. The technology in itself wasn't brand new when people at the Media Lab started hacking it, but the uses they came up with were innovative.

"Why overthink things? Just build something that seems fun and let that be your contribution," Teemu Leinonen says.

"Of course you want to leave your mark in shaping the future," Perttu Hämäläinen says.

That's what a lot of departments like the Media Lab aspire to, but only some of them succeed. For others it's just a cliche and a repetition of Kay's dictum about designing the future. There are also more prosaic challenges.

"Aalto University is infatuated with metrics. It's not enough to get published often, if you want to change the world. Your ideas need to get out in the public sphere. Usually a paradigm shift starts from a commercial application. Only a few people read research papers. Game developers certainly don't," Hämäläinen says.

Right now his research group is working on an augmented climbing wall that tracks the climber's movement and projects the easiest climbing routes on the wall. Exergaming, as the genre combining video games and physical exercise is called, is a growing business, as is the whole e-health and wellness sector.

Hämäläinen has no ongoing research projects in cooperation with companies at present, but hopes this will change in the future.

Part of the future-oriented thinking at the Lab takes the form of hands-on development.

In Koray Tahiroğlu's assessment, the next generation of smart interfaces will develop in two directions. The interactions between the user and the

interface will become less digital or artificial, as sound and other means are used to enhance the interaction. In addition the devices themselves will become smarter and capable of more interaction between each other.

Tahiroğlu grabs a coffee cup from the table.

"We have a certain way of interacting with a cup. It's a very natural interaction, where we don't think about how we're holding it," he says.

It's not the case with most digital devices, as people lack the tacit knowledge that they can draw upon when dealing with these material objects. That's something the SOPI research group is interested in improving.

Multimodal thinking emphasizes the fact that people take in information via different means. Now Tahiroğlu picks an example, this time a pen.

"I can feel it, when writing I can hear it, and I can see it. But digital devices can't provide that kind of feedback and that increases our cognitive load."

The role audio plays in all this is crucial, because it can do things other media can't.

"You can listen to radio while driving a car, but you can't drive and read a newspaper at the same time," Tahiroğlu says.

SOPI group's scope isn't limited to just everyday objects, but artistic appliances as well, which need to take the artists' intuition into consideration and to integrate smoothly with the artists' work.

"I remember when the Media Lab celebrated its tenth anniversary. That already felt like a real achievement, and now we're at twenty," Pipsa Asiala sighs.

It's not a disappointed sigh or a tired one, but one of disbelief at everything that's been done during the years. Twenty years of work at the Media Lab have flown by.

"At its best, working here is pure joy. Getting to play around with all these talented people, and nobody's telling you what not to do. I get to dream with our students. Things might go off in an unexpected direction and they're allowed to do that," she says.

For students, the Lab can function as a launching pad. After graduating they go out into the world and do things that couldn't have been dreamt of even a few years before.

"I'm very excited about the concrete ways in which our students are building the future," Asiala says.

They have been involved in a broad range of projects from personal art projects to design for the Finnish presidential office and The World Bank.

The experience and skills gained have allowed them to start diverse careers. As an example Asiala mentions Lasse Seppänen, one of the first students at the Lab, who had a strong interest in the games industry. He now heads Playraven, a game company that recently raised considerable venture capital at the Slush startup conference in Helsinki.

The Media Lab isn't only concerned with its own future, but the way life is turning out for all of us.

In the future, the success of individuals will depend ever more on their digital competence. The ever rising tide of outsourcing means manufacturing will be shipped overseas, so more and more people will have to start freelancing, creating their own modes of employment and competing with one another. That calls for digital skills that aren't yet commonplace.

"IN THE FUTURE, THE SUCCESS OF INDIVIDUALS WILL DEPEND EVER MORE ON THEIR DIGITAL COMPETENCE"

"Can a florist take advantage of the web and create a new product or service? A just-in-time pickup of flowers or whatever?" asks Kari-Hans Kommonen, Director of Arki research group.

Six years ago, in 2006, he was frustrated about the direction Finland was taking in digitalizing broadcast television. He was quoted as saying "I hope this is the last major technology project that's done without being in touch with the ways people actually use media."

Has he got his wish? Partly. Now there's talk of setting up a national data exchange layer like the one that powers Estonia's e-government services, and there are projects such as Apotti, the hugely ambitious IT project that will be used by the Hospital District of Helsinki and Uusimaa region.

"Maybe the difference is that now we don't have such monumental changes to be expected," Kommonen says.

It doesn't mean the problems have gone away. Rather they keep popping up from new angles. The fact that a large group of stakeholders is involved in the development of the national data exchange layer doesn't in itself mean that the Finnish working culture has changed.

"Maybe the old thinking now manifests in the thinking that Tekes is meant to give birth to export companies and export products, and if it does that, everything's fine. But we're facing a problem of a different magnitude than the digitalization of television. There's still a continuing need for a societal rethink," Kommonen says.

Change is happening fast. It's so fast that Finland cannot wait until the next generation comes to power. Before that happens, we will already have had a major crash that forces us to rethink the Finnish system entirely, Kommonen believes. His prediction is that in the next ten years we'll have to upgrade many parts of the society that thus far have been considered eternal and unchanging.

Kommonen also believes that one of these inevitable changes is the patent system, which he sees as fundamentally broken. It is imperative for governments to take a major role in leading the redesign of the patent system, but without the backing of companies it seems unlikely.

"There will be excesses of such magnitude that even major companies will grow tired of the system," he predicts.

Kommonen casually proposes a few scenarios.

"Who knows what'll trigger it? Maybe at some point we'll notice that all the patent portfolios have been bought up by Chinese companies, which leads to a prolonged trade dispute with China. First the argument will be that you should treat intellectual property just like we do."

When that dries up, a new approach will be hatched, one that treats intellectual property in a completely different way than we're used to.

For someone who's made his career in envisioning the future, Kari-Hans Kommonen is no techno-utopian. In fact he's pretty much the opposite, with a strong disdain for the flavour of the month solutions that seem to spring from Silicon Valley, spread among the Technorati, and promoted by the popular press.

"I've been going against the grain when it comes to visions of self-driving cars and packages delivered by quadcopter drones. They're unlikely scenarios and terrible ones at that. It'd be a terrible waste to spend a nation's resources on something like that," he says.

The names change but the story stays the same: semantic web, augmented reality, robots; all coming soon to revolutionize everything! Kommonen calls it invention fetishism. The problem is that concentrating on huge disruptive changes misleads people's thinking.

"I don't see the current digital environment being a result of such inventions. It's the sum of much smaller inventions that have revolutionized our society," Kommonen says.

Teemu Leinonen would agree. He isn't a technological determinist, so the common refrain of 'that was inevitable after X was invented' strikes him as false. Technological innovations facilitate some outcomes and make others less probable, but people are still the driving force.

"THE PROBLEM IS THAT CONCENTRATING ON HUGE DISRUPTIVE CHANGES MISLEADS PEOPLE'S THINKING"

"Technology doesn't come from a void. We have societal ways of steering research and development, and it matters. Those are the decisions that shape the world," Leinonen says.

The work done at the Media Lab isn't the kind of technological utopism that often is associated with future research. Kommonen reminds people of this almost every time he is asked to comment on future scenarios. The focus is elsewhere, on a more human level.

Take, for example, the current situation where people are flooded with digital content, photos and videos. The problem is that people own a wide variety of different devices that they connect to yet further devices and then want to share their photos and videos with a friend who may have a third kind of device. This creates a diverse ecosystem that isn't controlled by any single vendor and is an uninteresting business problem for the industry. It's a huge problem, and nobody has a proper solution to it.

Kommonen sees problems in how public research funding prioritises projects and themes.

"Funders don't trust the researchers to know what's worth researching. If you're a researcher with a strong understanding that you're onto something important, and that you're ahead of the rest of the world, it's almost certain that the funders haven't considered the topic yet. By the time they do, you've already fallen behind."

He proposes a different kind of public research funding mechanism, where the novelty of an idea is given more weight.

"Things that aren't being researched elsewhere are interesting by default," Kommonen says.

The need for the kind of thinking, teaching, and research being done at the Media Lab certainly won't diminish in the future. The Lab could function as a seed bed with proven methods and the track record to prove it: Showcased at Ars Electronica in 2006, winning the Finnish Mindtrek Grand Prix at Tampere in 2000 and 2003, The Centre for Excellence in Education Award 2003 (2004–6) by FINHEEC, the Prix Möbius Nordica, Award for Innovation for SORMINA by DA student, Juhani Räisänen, as well as SIGCHI Finland's Best Masters Thesis awards in 2011 and 2012.

The challenging thing is managing growth and finding the resources for it.

"We want to grow, we have a lot to contribute, and we know how to grow. In my opinion, there will be an enormous need for the kind of skills we develop here at the Media Lab," Kommonen says.

PHOTO CREDITS

CONTRIBUTORS

Image of Pipsa Asiala by Veera Asiala
Image of Andrea Botero by Pinja Valja
Image of Nuno Correia by Sune Peterson
Image of Teemu Leinonen by Hans Põldoja
Image of Marjo Mäenpää by Kati Åberg
Image of Perttu Rastas by Kai Ekholm

Page 2: Path (Polku) by Valtteri Wikström ja Jairo Acosta shown as part of the Sounds from Finland project, Tokyo 2014. Photo: Spiral Hall

Page 10: Taavi Varm and José Jacome perform their work 7 Bit Army during Christmas Demoday 2013. Photo: Kati Åberg

Page 30: Can Uzer (in foreground) tries out a game during the Spring Demoday 2014. Photo: Kati Åberg

Page 40: Ilmari Arnkill tries out WeStyle by Tuukka Takala and Lauri Lehtonen at the Christmas Demoday 2013. Photo: Kati Åberg

Page 46: Andrea Botero and Kimmo Karhu present the apps80s -project during Spring Demoday 2014. Photo: Kati Åberg

Page 64: Stone, Paper, Scissors – FIGHT by Pouyan Mohseninia & Thomas Thibault at the Christmas demoday 2013. Photo: Kati Åberg

Page 72: Path (Polku) by Valtteri Wikström ja Jairo Acosta shown as part of the Sounds from Finland project, Tokyo 2014. Photo: Spiral Hall

Page 84: Chi-Hsia Lai performs her work Wander On Stage - Untitled # X at the Christmas Demoday 2013. Photo: Kati Åberg

Page 94: Daisy's Amazing Discoveries - image by Marja Vainionpää, photographs by Kari Kankainen

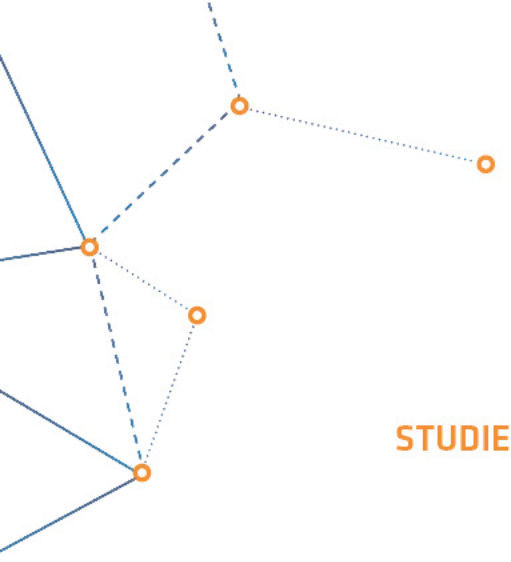
Page 106: Detail of demo presented at Spring Demoday 2014. Photo: Kati Åberg

Page 112: Haruspex (Ava Grayson & Tuomas Ahva) perform at Media Lab's Spring Demoday 2014. Photo: Kati Åberg

Page 122: Kinect Rain by Taro Morimoto, Christopher Jon Andersen, Pouyan Mohseninia at the Spring Demoday 2014. Photo: Kati Åberg

Page 132: Urban Alphabets by Suse Mießner at Spring Demoday 2014. Photo: Kati Åberg

Page 140: Miikka Junnila's mobile phone becomes a loudspeaker during the presentation of Fields)_(by Sébastien Piquemal and Tim Shaw at Spring Demoday 2014. Photo: Kati Åberg



NEWS

STUDIES

ORGANIZATION

HISTORY

CONTACT

medialab.aalto.fi

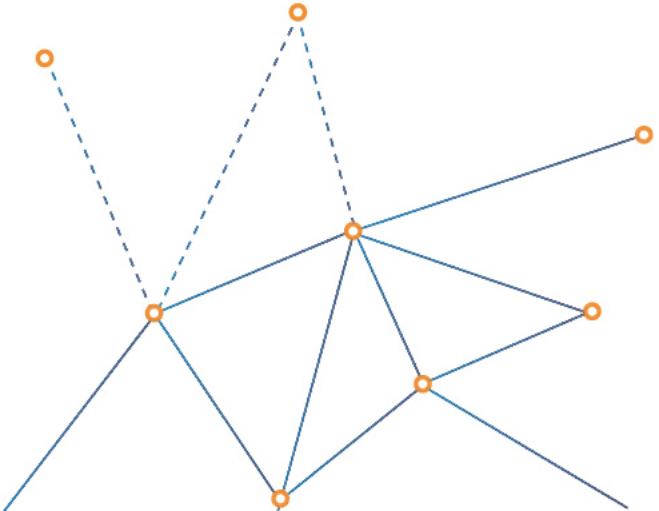
WORKS

RESEARCH

ADMISSION

PUBLICATIONS

DEMODAYS



Aalto University