InContext: Futuring User-Experience Design Tools

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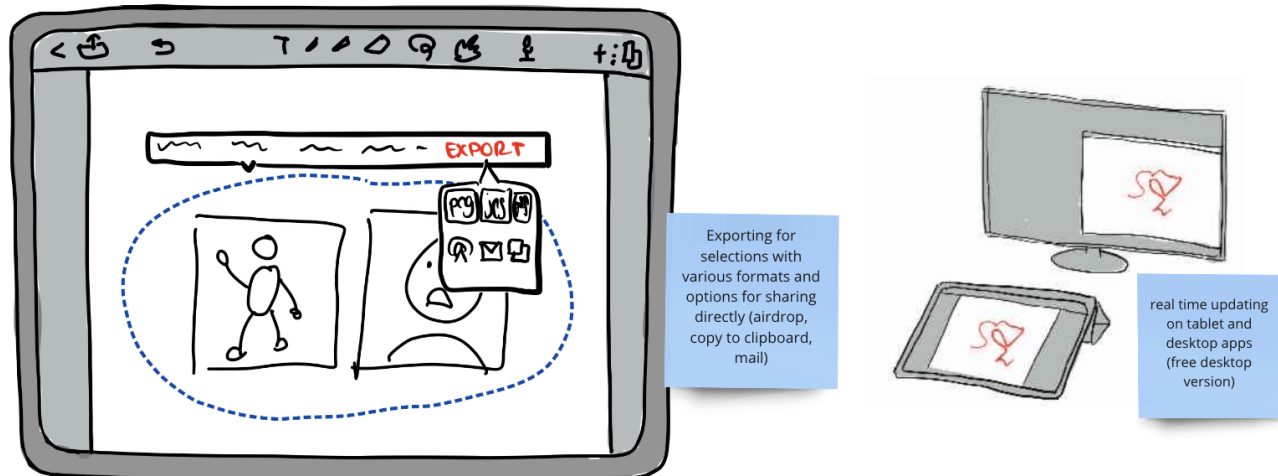France

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Figure 1: Participant ideation sketch from workshop 4, including sticky notes from Miro.

ABSTRACT

Technology is changing, which means the design processes supporting it must also change. Digital tools for user experience and interaction design are vital in enabling designers to create appropriate, enjoyable and functional human-computer experiences, and so will necessarily evolve alongside our technological development. This workshop aims to support the futuring of user experience and user interfaces, and will engage with stakeholders, practicing designers, researchers, students and educators in order to understand better the needs for next-generation design tools. We will envisage new forms of design tools that encourage best practice, for example, linking representations, analysis tools, just-in-time evidence, physicality, experience, and crucially, put context at the centre of design.

CCS CONCEPTS

• **Human-centered computing → Human computer interaction (HCI)**.

KEYWORDS

UCD, UX, user experience, digital tools, future

1 BACKGROUND

Design tools are a key part of user experience design and interaction prototyping, but what does the future hold? This workshop will bring together UX researchers, educators, practitioners and tool creators, so that we can explore and envisage next generation user experience design tools.

Humans have always been tool users: tools to do things, but also tools to make tools, even our neolithic ancestors used hammerstones to flake flints. Tools have also been a central part of the development of human–computer interaction. Many of the core elements of modern interfaces found their genesis in programming environments such as Smalltalk and user interface development tools have been a central to understanding user interaction since the 1970s [4]. By the 1980s early task analysis and workflow tools were emerging as well as systems such as HyperCard and Visual Basic embodied many of the features we still see in high-fidelity prototyping tools we see today. Alongside paper and the ubiquitous post-it note, tools for storyboarding and sketch-based interaction design, such as Denim [7] have helped support early design.

Design tools help us to work more easily and effectively: aiding communication with stakeholders, enabling collaboration within design and development teams, and potentially blurring the boundaries between early design and low-fidelity prototyping. However, tools also shape the way we think; they may constrain or limit us to a fixed palette, or open our eyes to new viewpoints.

Are the tools we have sufficient and appropriate, or are there gaps or pain points restricting adoption, or worse restricting the creativity and effectiveness of designers? Could new or renewed tools improve what we create and how we create?

This question is of growing importance as the nature of technology and of user interaction is changing. Many tools focus on screen-by screen interactions, but rich design needs to consider wider spatial and social context. Furthermore, more novel interactions often include physical devices as well as digital interactions [1, 3]. These new wider contexts and new modes of interaction demand new tools and possibly even new classes of tool support.

So, we have two directions to consider: future tools for existing interactions and tools for future interactions (Figure 2). These are not independent. On the one hand, new interaction technologies will help us see the limitations in existing design tools. On the other hand, pushing design tools away from a focus on screens towards broader context and better overall experience support, will make them more ready to embrace emerging technology and changing patterns of use.

1.1 Prior Research Activities

Several members of the organising team have previously hosted or participated in four previous exploratory workshops as part of the InContext project [2]. These workshops examined user experience tools from the perspective of industry, educational professionals, researchers and students. Participants from these diverse groups joined into a discussion on the future of user experience tools, to support the development of software to better support the novel and multi-modal aspects of user experience. These were hosted through the lens of computer science, and Human Computer Interaction, and also were privileged to gain attendance from several individuals who work across disciplines within social sciences, design, education and more. The tools we imagined and propose could democratize the design of interactions across disciplines.

The InContext team co-presented a paper *"Where, Who, Why? Tools to Encourage Design In Context"* at the EduCHI symposium at CHI 2021 [2] (see also Figure 3). The paper presentation was used as the starting point of one of the focus-group discussion sessions. The Miro boards for this are part of the public record of the symposium and thus available for further analysis upon request from the organisers.

2 ORGANIZERS

The following academics, practitioners and students will be organising the workshop and pre/post-workshop asynchronous activities. Figure 4 shows a montage of research completed by the authors.

Anna Carter is a PhD Researcher in the Centre for Doctoral Training at Swansea University where she is focusing on enhancing human interactions and collaborations with intelligence driven systems. Swansea City and County are stakeholders within the PhD project which involves deploying a range of technologies within the £1.3bn city regeneration project. Her research focuses on using human centred methods to co-create an immersive digital experience throughout the city centre using a range of next generation technologies created through participatory design. Designing inclusively is essential to all of her work and she is currently the accessibility chair for EduCHI 2022.

Miriam Sturdee is a Research Fellow and lecturer in the School of Computing and Communications, Lancaster University, where
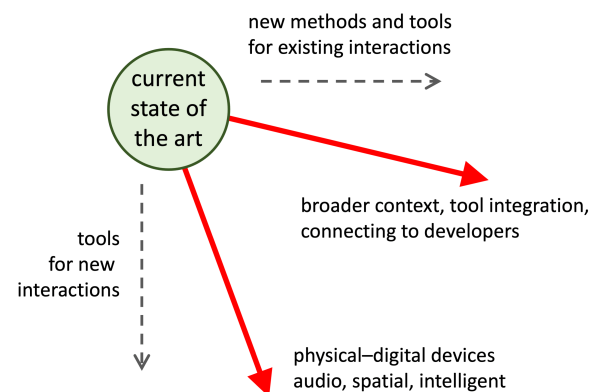

Figure 2: Future tools for existing interactions and tools for future interactions
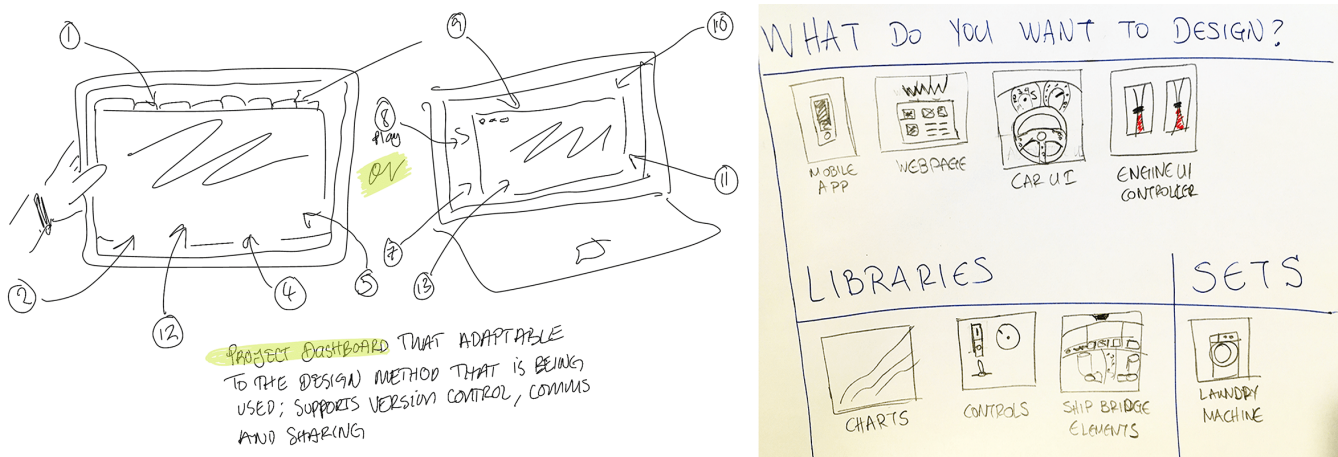
Figure 3: Universal UX tool dashboard ideas by participants during workshops 2 & 4

she investigates visual and creative methods for the advancement of computer science, with a particular interest in the design of novel interfaces. Her current work is examining the user experience of shape-changing interfaces, exploring the visual side of cybersecurity [13], and the co-existence of the arts and HCI [12]. She also has an MFA in Visual Communication from Edinburgh College of Art, and an MA in Psychology. She has previously organised workshops on Sketching in HCI (DIS 2017), art and tangible interaction (CHI 2020), novel cycling interfaces and futuring peer review (CHI 2021).

Alan Dix is Director of the Computational Foundry at Swansea University, a £31m investment by the University, Welsh Government and European Union to create a place to nurture fundamental digital research that makes a difference to real lives. Previously he spent 10 years in a mix of academic and commercial roles. Alan has worked in human–computer interaction research since the mid 1980s and is the author of one of the major international textbooks on HCI as well as of over 500 research publications from formal methods to design creativity. His work has often looked over the technological horizon, for example in 1992 he wrote possibly the first paper to highlight the potential for gender and ethnic bias in black-box machine learning algorithms, and in 2000 led development of an early (albeit too early!) social networking system. Social impact is also crucial to his work and he is currently responsible for the algorithmic social justice theme of the UK Not-Equal network for Digital Economy and Social Justice.

Martha Aldridge is a Design Consultant of 14 years with a wealth of experience in multiple domains including government, early years and special needs education and medicine. She has been a consultant for multiple academic research groups from scientific instrument design to improving independent online learning for autistic children, and has contributed to the design of accessible government services since 2013. She has also led the design of large scale public health studies and the effective use of public health data for driving policy and local authority spending decisions. Martha currently works remotely as a digital transformation consultant for public and private sector clients.

Dani Kalarikalayil Raju is co-founder of Studio Hasi, a startup with a mission to diversify future making. He is an alumnus of IDC School of Design, IIT Bombay and has been working with resource constrained user groups (Emergent Users) in India for the past 5 years in collaboration with the Computational Foundry at Swansea University. The consistent theme in his work is that of exploring futures with users having constraints such as low literacy, lack of technology experience and low self efficacy, by engaging them in workshops and deployment studies to re-imagine forward looking technologies for the world. Working with emergent users in two of Mumbai's slums, his recent work explored the value and uses of photovoltaic (PV) self-powered deformable digital materials for interhome connections. He was awarded the Gary Marsden Travel Awards for presenting this work at CHI 2021.

Eunice Sari is the CEO and Co-Founder of UX Indonesia and Co-Founder of Customer Experience Insight Pty Ltd with more than 18+ years of global experience working in the field of User Experience and Customer Experience Insight in academia and industries. She holds Ph.D. in Education with a specialization in Design Research and Educational Technology. Eunice has pioneered many forward-thinking and innovative projects to affect lives and improve businesses' bottom line in various vertical industries in the USA, Europe, Australia, and Asia. Eunice was the first Asian female Google Developer Expert in Product Design and Strategy and currently is the Product Design expert mentor for the Google Startups program. She has helped hundreds of international startups through Google Launchpad and Accelerator Programs to develop their products and services and improve their business. Eunice has been helping and inspiring many academics, especially in the Asia Pacific, to design their HCI, UX, and Design teaching and learning programs with out-of-the-box tools and approaches that she has developed throughout these years.

Wendy E. Mackay is a Research Director, Classe Exceptionnelle, at Inria, the French National Research Center for Computer Science, and is an ACM Fellow, CHI Academy member and the 2022 Chair for Computer Science at the Collège de France. Wendy directs the ExSitu (Extreme Situated Interaction) research lab, which focuses

on creative professionals and 'extreme users' who push the limits of technology, to develop novel human-computer partnerships. Her lab is joint with the Human-Computer Interaction department of LISN (Laboratoire Interdisciplinaire des Sciences du Numérique) at the Université Paris-Saclay, where she teaches theoretical and practical interaction design. She has been actively involved in the creation of methods and interactive tools to support creativity, both in industry and research, since the 1980s and has published numerous articles on design, particularly with respect to the use of video and interaction design.

Elizabeth Churchill Elizabeth Churchill is a Director of UX at Google. With a background in psychology, Artificial Intelligence and Cognitive Science, she draws on social, computer, engineering, and data sciences to create innovative end-user applications and services. She has built research teams at Google, eBay, Yahoo, PARC and FujiXerox. Her current focus is on the design of effective designer and developer tooling. Elizabeth holds a PhD from the University of Cambridge and honorary doctorates from the University of Sussex and the University of Stockholm. She is a member of the Association for Computer Machinery's (ACM) CHI Academy, is an ACM Fellow, Distinguished Scientist, and an ACM Distinguished Speaker. She served as the ACM's Vice President for 2 years, from $2018 - 2020$. In 2016 she received a Citris-Banatao Institute Award Athena Award for Women in Technology for her Executive Leadership. She has been named one of the top women leaders in UX over the last several years.

3   WEBSITE

The workshop web page will be hosted as part of HCIbook.net and is linked to here: hcibook.net/incontext/chi2022. Participant submissions will be made available after acceptance on the website, and the website maintained after the initial workshop event.

4   PRE-WORKSHOP PLANS

Our previous scoping workshops have created a network of interested researchers and practitioners who we can reach out to. Additionally, many of the organisers are on Twitter and can utilise their networks to advertise the call, as well as using more traditional methods such as the CHI mailing list. We will also direct people to the website (see previous section) and keep this regularly updated with useful information in the run up to the live conference dates. As the workshop is intended to be run in hybrid fashion, we anticipate being able to offer a range of accessibility options (e.g. wheelchair access, captioning as available via the conference platform), and will make a "kit-list" for remote participants who wish to actively take part in the hands on activities. Miro, or another collaborative online whiteboard will be used to enable upload of collaborative images both in person and remotely. This whiteboard environment will be designed and made available to participants prior to the event to enable community building and networking.

5   WORKSHOP FORMAT

As InContext will be a hybrid format workshop we anticipate a number of in-room/technical requirements:

(1) A large screen/projector for bringing remote participants into the room, presenting material, and monitoring the Miro board in real time;
(2) Flip-chart and markers for physical notes;
(3) Large tables to facilitate activities such as paper-prototyping and making;
(4) Appropriate recycling facilities for used workshop materials.
(5) For remote attendees, we would request that live captions are available (either automated or manual).

More accessibility requirements may emerge once participation is confirmed, and we will put an accessibility statement on the website to enable requests to be made as early in the process as possible. We expect to use Miro for our collaborative whiteboard, and this platform has been improving its accessibility recently. Should a more accessible alternative be identified, this may be used instead. The Miro board (or alternative) will also be available asynchronously, with an activity list for individual participation prior to and after the synchronous event. If circumstances change, the workshop will move entirely online.

6   WORKSHOP STRUCTURE

The workshop will combine positional presentations, practical, hands-on activities and discussion to support innovation and networking. The hybrid format ensures we can maximise attendance and engagement both prior to, during and after the conference. We aim to assign a in-person laptop member to each table to enable zoom members to be part of the in person groups with break out rooms assigned to each table.

6.1   Pre-Workshop Activities (Asynchronous)

Introduce Yourself: Participants will be invited to fill out a short workshop "persona" on the online whiteboard.
Read & Discuss: Accepted submissions will be linked from the website, and summaries posted on the Miro for participants to comment on and discuss prior to the synchronous event.

6.2   Synchronous Hybrid Event

Indicative format and activities, breaks and lunch will be confirmed as per the CHI2022 schedule:
Introduction & Welcome: Organiser introductions and scoping the problem. (30 minutes)
Participant Pecha Kucha: Each participant will have between 3 minutes to present their position paper or pictorial (we are anticipating up to 15 participants in addition to the organisers). (Up to 45 minutes)
Break: Tea/coffee break
Participatory Design Activity: This activity will focus on brainstorming and the current state-of-the-art of UX design tools (with introduction by WEM). Using Video Clipper, a tool that supports co-located or remote collaborative video capture during brainstorming and scenario-based video prototyping sessions, participants will form groups and discuss, iterate and present their thoughts following the initial pecha-kucha. Video Clipper will lightly guide video capture during the creation process to completely avoid post-hoc editing and produce a helpful record of the process. Both single-user iPad versions and a collaborative, web-based version is available

Figure 4: A montage of contextual design work completed by the authors. From top left to bottom right: 1) A participant interacts with a white-box prototype of a shape-changing interface [11]; 2) Foto-foto training events [6]; 3) Participatory design for creating virtual environments [9]; 4) Brainstorming activity based on the pros and cons of educational platforms [10]; 5) Sketch for EduCHI work [2]; 6) A user interacting with a tangible embedded interface designed for the Covid Era [1]; 7) Designing with Sticky Notes [8].

which will work with any mobile device with a camera, hence supporting in person and remote attendance. (20 minutes)

Question Formulation & Democratic Idea Generation: Writing questions for the UX Research using adapted Question Formulation Technique and democratic idea generation using 4 Steps of Sketching (introduced by ES). (15 minutes)

Day in life Activity: Prototyping activity that asks the participants to immerse into different place based contexts including: one of a slum resident in Mumbai, one of a resident of Swansea's digital regeneration hub, a beach visitor in Perth and a inhabitant of Alcatraz, San Francisco. The participants will be divided into groups with each group given a different area of context (introduction by DKR). The aim will be to think about a design intervention that would aid the residents of each area (20 minutes).

Break for Lunch: Takeaway/Delivery lunch to eat in room with remote participants (orders taken before morning break, from identified options to support dietary requirements).

Sketching Activity: Prototyping activity that asks the participants to sketch eight new design tools beginning with a quick fire discussion about the range of pain points that they experience with current prototyping tools (introduction by AC). Then moving on to sketching using the Crazy 8's design sprint method to create a series of eight designs that would improve or replace existing tools [5]. The users will be asked to sketch eight designs within eight minutes and then present those to the group (introduction by ES). (20 minutes)

Collaborative Sketching: Collaborative sketching exercise, bringing together the images generated from the initial sketching activity

(introduction by EC). Participants will be asked to iterate, combine, doodle on their ideas, working in small groups to take inspiration from the solo activity. (30 minutes)

Break: Tea/coffee break

UX 'Playgroup': A hands-on activity involving paper-prototyping, physical prototyping, fuzzy-felt and making. Working with ideas and thoughts from the sketching exercises, this maker activity will be based around design fiction and speculative design (with introduction by MS), participants will be asked to think about the connections between novel interfaces (including tangible and virtual interactions) and, by making, exploring some of the possible interactions and issues that arise when designing for novel interfaces. (45 minutes – with break options)

Show & Tell: Small group presentations of pain points, solutions and possible UI design for the future of UX tools (2 minutes each). This will draw on experience of tool use for future contexts during the workshop as well as prior experiences discussed during the various activities. (30 minutes)

Reflections & Wrap-Up: End of day thoughts and takeaways. (20 minutes)

6.3 Post-Workshop Activities (Asynchronous)

Reflections on the event: We will invite thoughts, ideas and discussion points to keep the conversation going. There will be an area of the online whiteboard to place these items.

7 POST-WORKSHOP PLANS

InContext is a stand alone workshop looking at the future of user experience design tools, although we will make available initial findings from our scoping workshops in this area, subsequently inviting dialogue from invited participants. We anticipate at least three outputs:

- Publication of a workshop report "manifesto" including sketches, discussion and takeaways for the future of UX design tools, and/or Interactions article (post-proceedings)
- Working group formation
- Full paper synthesising and analysing pre/post-workshop project data for CHI 2023

8 CALL FOR PARTICIPATION

Technology is changing, which means the design processes supporting it must also change. Digital tools for user experience and interaction design are vital in enabling designers to create appropriate, enjoyable and functional human-computer experiences, and so will necessarily evolve alongside our technological development.

We are hosting a workshop aiming to support the futuring of user experience and user interfaces, and will engage with stakeholders, practicing designers, researchers, students and educators in order to understand better the needs for next-generation design tools. The workshop will combine presentations, hands-on

practical experiences (in person and online), and group discussions to both create a user experience design tools futures manifesto, and the formation of a working group to share best practice and research.

InContext will be a one day, hybrid workshop to be held at CHI 2022. To take part, please submit a $4 - 6$ page position paper based upon the theme of *The Future of User Experience Design Tools*, either in ACM paper or pictorial format (e.g. Creativity & Cognition cc.acm.org/2022/pictorials/). User Experience is not simply about text, so we invite you to use the formats creatively.

Position papers and pictorials will be judged on appropriateness to the call, novelty, and openness to possibility. All accepted position papers will be hosted and maintained on the InContext website. Following CHI Guidelines all participants must register for both the workshop and for at least one day of the conference.

Paper/Pictorial submissions: Easychair

Workshop website: hcibook.net/incontext/chi2022

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