

GAMIFICATION & SERIOUS GAME

SYMPOSIUM 2016, JULY 4 & 5

STÉPHANE GOBRON



Front page image «Why so serious»
i.e. key sentence of the Clown in *The Dark Knight*, 2008,
directed by Christopher Nolan, in honor of our host:
the Neuchâtel International Fantastic Film Festival – NIFFF.

The first Symposium is organized by the HE-Arc, HES-SO
with the NIFFF within the *Imaging the future*
conference and the *Swiss Gamification* consortium
– July 4, 2016, Neuchâtel.

All short speeches are held the 4th of July 2016;
demos of the 9 corresponding serious games
are presented the 4th & 5th of July.

GS GS COMMITTEE MEMBERS

Stéphane Gobron | Prof. Dr. | president
Head of the *Image Processing & Computer Graphics* group, HE-Arc, HES-SO*

René Bauer | Lecturer
Head of Master Program Game Design,
in charge of the *Game Lab*, Zurich University of Arts (ZHDK)

Florence Quinche | Prof. Dr.
Expert in the field of Pedagogy applied to Video Game,
UER Médias et TIC dans l'enseignement et la formation, HEP Vaud

Yassin Rekik | Prof. Dr.
Expert in Innovative Interaction,
Gaming and Immersive Systems, hepia, HES-SO

Nabil Ouerhani | Prof. Dr.
Head of the *Interaction Technologies* group
at the HE-Arc Ingénierie, HES-SO*

Sam Rossetti
Coordinator of *Imaging The Future*
at the Neuchâtel International Fantastic Film Festival (NIFFF)

Sylvain Gardel
In charge of the Pro Helvetia “programmes d'impulsions”

CONTACT

stephane.gobron@he-arc.ch

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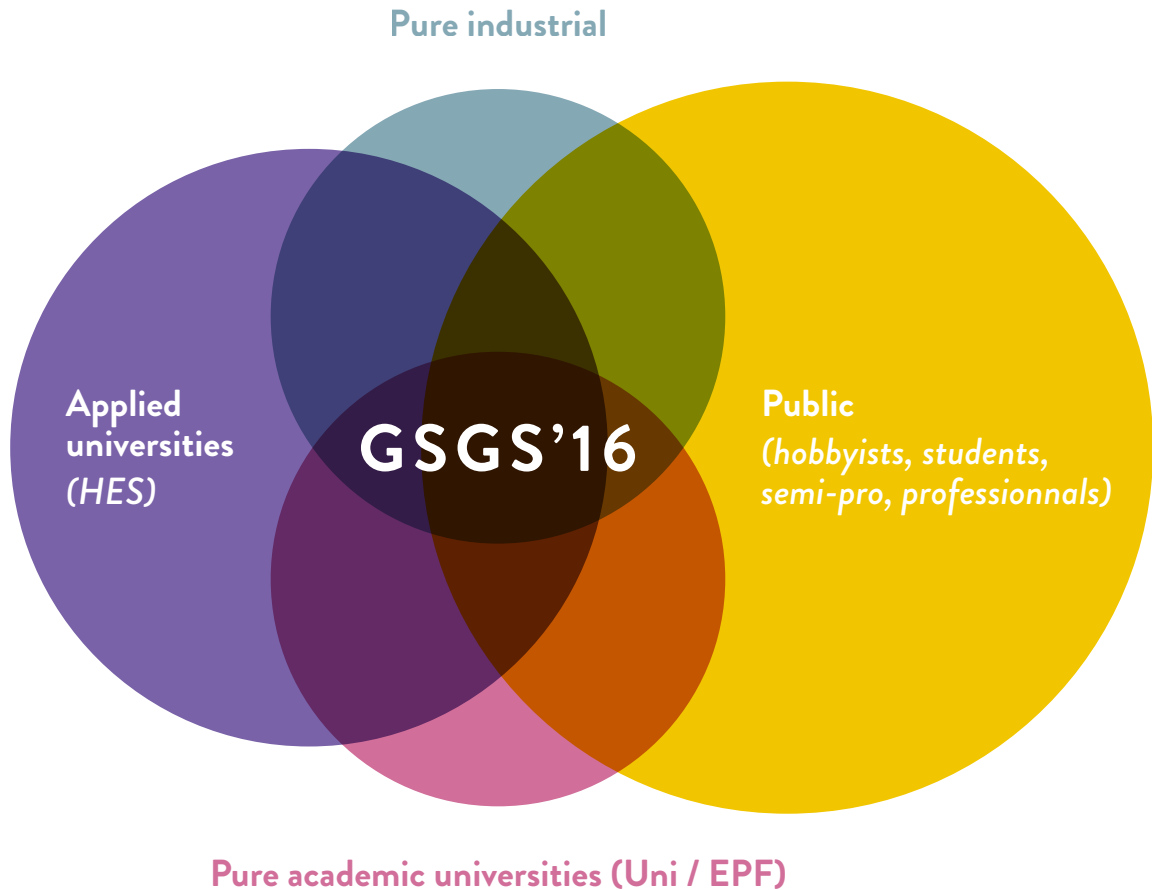
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* HES-SO: University of Applied Sciences and Art Western Switzerland

ORIGINALITY OF THIS SYMPOSIUM: AN INTER-PROFESSIONAL COMMUNICATION

This event has the unique opportunity to bring multiple applied universities, pure academic and pure industrial worlds all together on a common high potential ground: Serious Games & Gamification. As illustrated in the following figure, the symposium public – mainly composed of hobbyists, students, and professional – will be able participate.



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Four categories of people interacting to rise innovation.

MAIN CONCEPT

Reinforcing the bridge between local academic and applied worlds in the domain of Serious Game & Gamification, e.g. applied universities and startups. Focusing on three application domain, Health, Social, and Education, the figure next page illustrates the variety of short talks of the symposium. The three categories of talks (among 14 corresponding short papers): five concept-oriented in green, nine demo-oriented in black, and three roundtables.

SESSION HEALTH

9h00
1 Serious Games & Virtual Reality:
the Future of the Neurorehabilitation

9h15
2 Immersive Solution
for Phobias' Treatment

9h30
3 How SGs Can Help First Aid Services

9h45
4 Occupational Health:
Current and Foreseeable Challenges.
Can Serious Games Help Prevention?

10h00
roundtable Serious Games
& Silver Technologies

SESSION EDUCATION

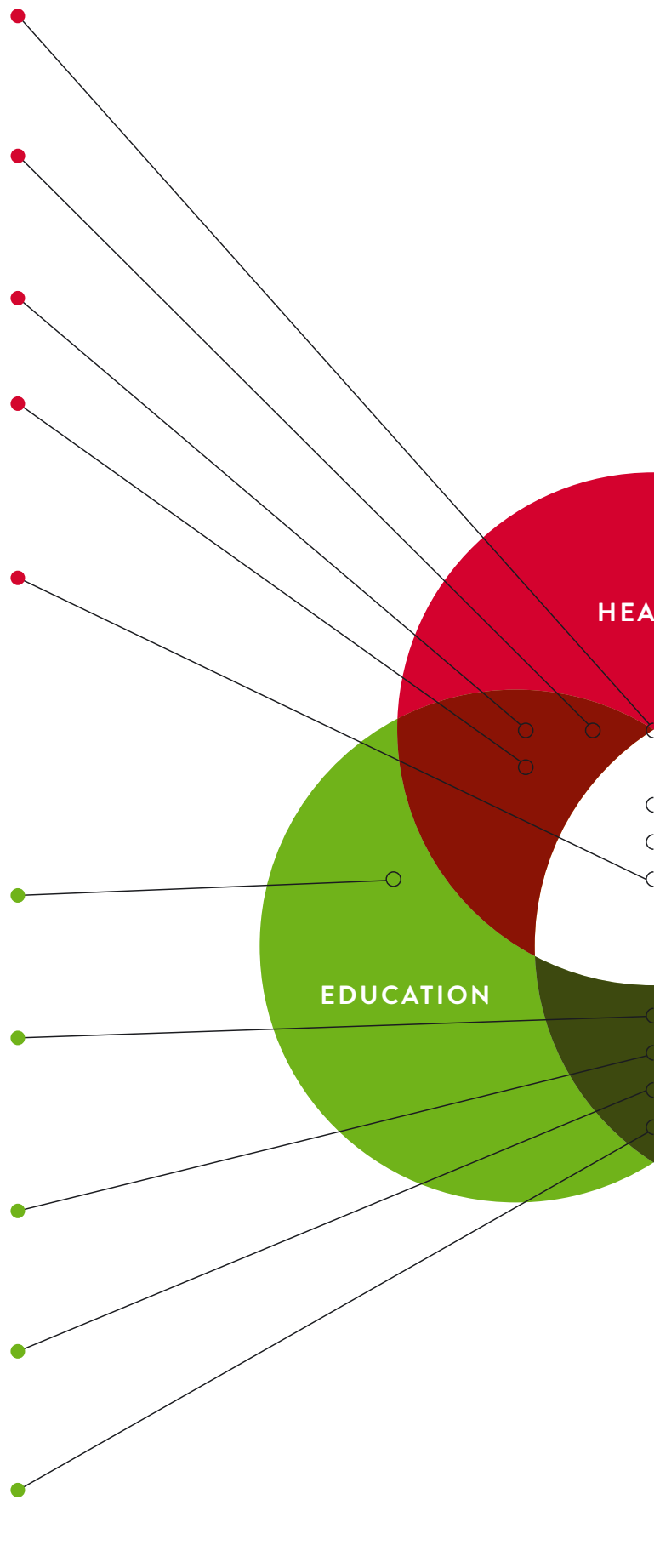
10h45
1 An Entertainment Game Used
to Explain Genetics in Class

11h00
2 From SG for Crime Scene
Coordination to a Reflexion about
the Roles of Images in Police Activity

11h15
3 PEGASO – A Serious Game to
Promote Healthy Lifestyles for Teenagers

11h30
4 A Serious Game to Teach
Design to Children

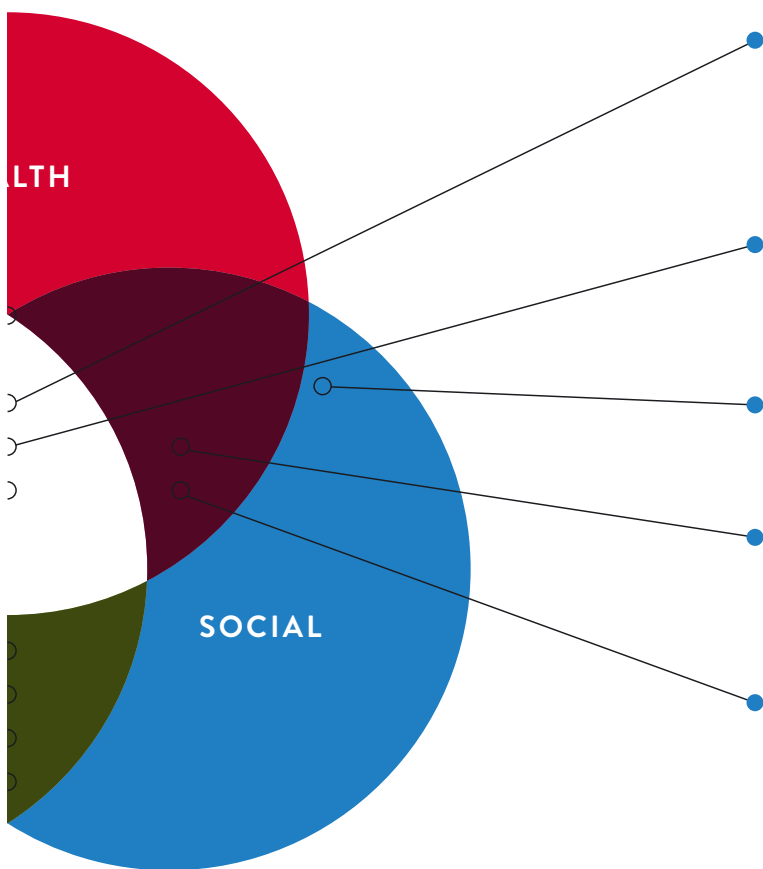
11h45
roundtable Serious Games
& Internet of Things



3 MAIN DOMAINS

HEALTH | SOCIAL | EDUCATION

7 POTENTIAL FIELDS OF APPLICATIONS



SESSION SOCIAL

13h00

1 Motivation Design in iMoMo:
Creating Motivation Cycles for
Crowd Water Sourcing in Tanzania

13h15

2 Accompanying the Dying, a Daily
Living for Young Nursing Professionals

13h30

3 Gamification of Real Life

13h45

4 The Dialogical Dimension
of Serious Games

14h00

roundtable Serious Games & e-Citizen

DETAILS

PROGRAMM

ARRIVAL

- 8h30–8h40** **Welcoming & Symposium Content**
Didier Rizzotti | R&D director of the Fac. of Eng. | HE-Arc, HES-SO | didier.rizzotti@he-arc.ch
- 8h45–8h55** **Serious Game, Gamification, eLearning, and Simulation** pp. 8–10
In the field of R&D terms such as serious games, gamification, simulations, eLearning are more and more encountered... and mixed!
Stéphane Gobron | HE-Arc Ingénierie, HES-SO

SESSION HEALTH

CHAIRMAN: RENÉ BAUER

- 9h00–9h10** **1 Serious Games & Virtual Reality: the Future of the Neurorehabilitation** pp. 12–13
The use of serious games combined with robotic has shown to be a real positive solution for millions of people suffering from physical disability after a stroke.
Yannick Charrotton | Lambda Health System | Yverdon-les-Bains
- 9h15–9h25** **2 Immersive Solution for Phobias' Treatment** pp. 14–15
This talk introduce a generic solution helping therapists to treat phobias' victims through customized immersive scenarios and associated monitoring and management services.
Yassin Rekik | hepia, HES-SO | Geneva
- 9h30–9h40** **3 How SGs Can Help First Aid Services** pp. 16–17
We present a SG prototype that enables early childhood professionals to provide aid techniques playfully, to train their ability to handle first-aid situations.
Domingos Correia De Oliveira | HE-Arc Santé, HES-SO | Neuchâtel
- 9h45–9h55** **4 Occupational Health: Current and Foreseeable Challenges. Can Serious Games Help Prevention?** pp. 18–19
In speeddating mode: presentation of occupational health problems such as psychosocial risks, quality of work-rest and personal life, musculoskeletal disorders and other work-related risks.
Vera Bustamante | Dept. of Health at Work, CHUV | Lausanne
- 10h00–10h20** **roundtable Serious Games & Silver Technologies** p. 20
all short talk speakers
- 10h30–10h45** Short break

SESSION EDUCATION

CHAIRMAN: NABIL OUERHANI

- 10h45–10h55** **1 An Entertainment Game Used to Explain Genetics in Class** pp. 22–23
The story of a game which was not designed to teach but is now used in classrooms
Philomena Schwab | niche-game.com | Zurich
- 11h00–11h10** **2 From SG for Crime Scene Coordination to a Reflexion about the Roles of Images in Police Activity** pp. 24–25
A serious game, taking on the role of the head of a police forensic unit, was developed to stimulate the use of knowledge and skills in a collaborative problem-solving perspective.
Olivier Delémont | Forensic Sciences, UNIL | Lausanne

- 11h15–11h25** **3 PEGASO – A Serious Game to Promote Healthy Lifestyles for Teenagers** pp. 26–27
Demo of the mobile serious game and its integration in the ecosystem of services aimed at promoting healthy lifestyle for teenagers.
 Stefano Carrino | HumanTech Institute, HEIA-FR, HES-SO | Fribourg
- 11h30–11h40** **4 A Serious Game to Teach Design to Children** pp. 28–29
This game concept aims at producing games to develop 3D perception skills and cognitive abilities for engineering thinking.
 Florence Quinche | HEP Vaud | Lausanne
- 11h45–12h10** **roundtable Serious Games & Internet of Things** p. 30
 all short talk speakers
- 12h10–13h00** **Lunch break**

SESSION SOCIAL

CHAIRMAN: YASSIN REKIK

- 13h00–13h10** **1 Motivation Design in iMoMo: Creating Motivation Cycles for Crowd Water Sourcing in Tanzania** pp. 32–33
Creating motivation cycles for crowd water sourcing in Tanzania.
 René Bauer | Gamedesign ZHdK, Zurich University of the Art | Zurich
- 13h15–13h25** **2 Accompanying the Dying, a Daily Living for Young Nursing Professionals** pp. 34–35
Serious Game is a novel and suitable tool to support young nursing professionals in the difficult task of accompanying dying people.
 Pierre-Alain Charmillot | HE-Arc Santé, HES-SO | Neuchâtel
- 13h30–13h40** **3 Gamification of Real Life** pp. 36–37
Great Sam is a Web application that allows users to create quests in a platform for other users to complete in real life, in return of a reward.
 Spyridon Nompilakis | www.greatsam.com | Wake App Association (W.APP.A.) | Lausanne
- 13h45–13h55** **4 The Dialogical Dimension of Serious Games** pp. 38–39
Laypeople perceives electronic games as a kind of playful individual activity; why not suggesting otherwise?
 Antonio Iannaccone | University of Neuchâtel, dept of Psy. | Neuchâtel
- 14h00–14h30** **roundtable Serious Games & e-Citizen** p. 40
 all short talk speakers

CONCLUSION

- 14h30–15h00** **Conclusions Symposium**
 Philippe Grize | Director of the Fac. of Eng., HE-Arc, HES-SO
- Right Place, Right Time for Gamification** pp. 41–43
We will show why we believe Switzerland is the right place and the right moment for making all together a consortium on gamification and Serious Games.
 Nabil Ouerhani | HE-Arc, HES-SO

SERIOUS GAME, GAMIFICATION, eLEARNING, AND SIMULATION

Stéphane Gobron

HE-Arc Ingénierie, HES-SO, Neuchâtel
Contact: stephane.gobron@he-arc.ch

CONTEXTUALIZATION

In the field of R&D we increasingly meet terms such as “serious games”, “gamification”, “simulation”, “eLearning” as they become more popular. As these terms share common domains of application, they can easily be mixed up it is therefore important to make distinctions between different practices.

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THEME & OBJECTIVES

The purpose of this short paper is double: first, to propose a definition as short and simple as possible for each of the four terms and second, to emphasize common features and differences between them. The four concepts are illustrated in the figure.

ELearning concerns all online learning methods using an electronic device [1] such as training track distance education. Knowledge is often what is sought by users and is provided by databases or automatic systems (upper-left part of the figure). Not having a real professor nor teaching staff has the advantage of implying low costs for development and maintenance. Unfortunately, a large majority of current “e-Learning” software involved an interactivity reduced to the minimum, resulting in a lack of creativity, thinking, memorization, and questioning.

Simulation is a representation of a behavior or process in most cases related to any field like physics, biology or even economics or society (upper-right part of the figure). It usually reproduces real conditions with corresponding scales and measurement based on well-defined units, e.g. distance, weight or time. Real-time (that can be 60Hz or a day per frame) is frequently the main factor allowing the simulation rhythm [2].

Gamification is a recent and quite difficult term to define as even its origin makes debate; some say 2002, other 2008, furthermore, depending on whom



you ask, the definition might change. Gamification is the act of applying a layer of rewards to an activity (lower-right part of the figure), with the intention of making the activity more enticing and entertaining for its participants [3]. The reasoning behind it is that providing measurable and comparative feedback to perform an activity or action will motivate participants [4]. This term should not to be mixed with the process of transforming an activity into gameplay as gamification does not alter activities nor the way they are performed.

A **Serious Game** (SG) is before all a game, which has not as primary purpose the entertainment [5] but supports a serious purpose to train, search for or promote three possible cognitive levels: knowledge, skills or behaviors (lower-left part of the figure). SGs are often developed using computers and can be very similar to classic video games (which can strongly alter how we perceive the serious concept) or, on the contrary, have the appearance of simulation software. A SG being a game it has to follow its definition: games promote interactivity providing entertainment or amusement, with clear rules established before the beginning, and ending with a score or a threshold that almost always results into two possible states: losing or winning.

COMMON FEATURES AND DIFFERENCES

Here is a non-exhaustive list of properties that can help defining boundaries for each concept: eLearning is actually the only one that actually has to use computers, even if nowadays most simulations and SGs use it as main medium.

There are rarely feedbacks and virtually no interaction with eLearning whereas simulation and SG are essentially based on that notion. On the one hand simulations must be realistic as they represent a real phenomenon without alteration of its perception, resulting sometimes in a balance sheet. On the other hand SGs promote a “serious” purpose that must process a kind of entertainment and must end with success or failure. Intrinsic serious aspects have to remain intact but the process to reach the serious purpose and the appearance are often strongly altered. Gamification is a process that adds score (e.g. points) to an activity as a feedback purpose with respect to its properties in terms of the content and form.

A PRACTICAL EXAMPLE

It is not always easy to understand the difference especially when searching the best development strategy between *Gamification* and *Serious Game*. Here is a practical and simple example that might help concerning electricity savings extracted from a conversation with an expert in the domain (i.e. Dr. Björn Berg Marklund):

- › A **gamified solution** would be to apply a score display over a light switch that shows how often the lights are kept off, the task of turning on or off the lights remains the same, but is “amplified” with a game-inspired element;
- › A **serious games application** would be a game about light switches that highlights the effects and usefulness of electricity conservation. This principle hopefully should teach users the importance of being mindful of turning their lights off as much as possible.

This particular example is indeed a bit ironic, since running the game itself would be antithetical to its stated aims.

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SESSION HEALTH

9H-10H30

The combination of Serious Games & Health is a good fit, because games can add an intrinsic layer to the already existing extrinsic motivation, e.g. when in recovery. Yannick Charrotton (Lambda Health System) shows how serious games can motivate people to improve their physical abilities after a stroke by combining games and robots. Moreover, games provide new virtual and interactive possibilities for therapy. Yassin Rekik (hepia, HES-SO) talks about new approaches to treat phobias through customized immersive scenarios. Games can also serve as preparation for worst-case scenarios. Domingos Correia De Oliveira (HE-Arc, HES-SO) demonstrates how you can train early childhood professionals to handle first-aid solutions. But serious games can also be helpful before misfortune happens. Vera Bustamante (Dept. of Health at Work, CHUV) wonders whether and how serious games can help prevention, e.g. in work-related risks.

CHAIRMAN: RENÉ BAUER

1 | SERIOUS GAMES & VIRTUAL REALITY: THE FUTURE OF THE NEUROREHABILITATION

Yannick Charrotton, Aurélien Fauquex

Lambda Health System S.A., Yverdon-les-Bains
Contact: yannick.charrotton@lhs-sa.ch

CONTEXT

Every year more than 5 million people have a disability after a stroke, making this issue the most important cause of disability and loss of life quality [1]. The physical rehabilitation of those people requires daily training involving numerous movements to re-implement the motor patterns in the brain [2]. The number of required repetitions if done manually by a physiotherapist represents a strong physical effort and the precision constraints in terms of amplitude and speed have led to an increased robotic assistance. In parallel, the democratisation of video games and the increase of interfaces possibilities (IR sensors, video camera and image processing, etc.) have naturally led to the emergence of Serious Games as a motivation vector for rehabilitation. From the Wii to much more specialized products targeting specific diseases, different tools are now available for the therapists — especially for the upper limbs. Those games are particularly interesting in this field as patients often have difficulties maintaining their attention and concentration on monotonous exercises. This fact factor is increased as brain lesions are associated with cognitive impairments in most cases. Due to the high required number of repetitions, the training sessions quickly become tedious and patients tend to rapidly get disinterested in exercising [3] or even oppose to carry them out [4].

The recent discovery of mirror-neurons also opens a huge territory to explore. Those neurons, related to a specific task, are either activated if the patient does the task or if he observes it done by someone else [5]. The activation of those neurons was shown effective in the motor learning and they can be stimulated with games rendering an avatar or even just a limb in the virtual world. The learning effect on the motor skills using mirror neurons is expected to be superior [6].

PROPOSED SOLUTION

To help people with lower limbs disabilities, a consortium of universities and engineering schools of HES-SO (i.e. CHUV, HESAV, iAi — HEIG-VD, HES-SO, inSTI — hepia, HES-SO, and the Image processing & Computer graphics group — HE-Arc, HES-SO) developed a device called Lambda which can be used with a Serious Games and Virtual Reality platform [7]. The uniqueness of this concept is that it combines all the mentioned elements in one rehabilitation device. The motivation and the number of repetition are increased due to the joyful games and level challenges. Furthermore, some games also use a virtual avatar or limb to stimulate mirror-neurons.

The main advantage of this platform is its haptic possibilities. It means its ability to interact with the patient through touch. The patient could partially or totally define the robot movement and the robot could return a tactile feedback by applying forces or motion to the patient. Those haptic performances come from the high quality parallel robotic that



allows a great control and reversibility in combination with the best-in-class 3D graphic engine, efficient software and optimization. The result is an unmatched responsiveness to patient's action. Indeed, the worst case lag time between an interaction on the pedal and its linked printed effect on the screen or HMD is 35.3 ms. This fast refresh rate is the key to ensure the best patient immersion and efficient recovery.

Today, five games are available on the software platform targeting different types of improvements, patient profiles and pathologies. They have been tested by 33 therapists from various institutions fulfilling an anonymous survey targeting different data. The results showed that most of the games were considered as “encouraging replaying” and “adequate for rehabilitation”. Another interesting conclusion was that, even if the scenario, sound and graphics were poor compared to actual video games standard, therapists considered it as a good asset for physical rehabilitation. The next step is of course to confirm those results by studying the effect of those games in clinical trials.

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2 | IMMERSIVE SOLUTION FOR PHOBIAS' TREATMENT

Yassin A. Rekik, Mickaël Polla, Balthazar De Moncuit Deboiscuille

hepia, HES-SO, Genève

Contact: yassin.rekik@hesge.ch

During the last decade, Virtual Reality (VR) has made impressive progress. While VR technologies were reserved for specific uses in the past (scientific simulations, military applications), they now are more and more accessible to mainstream users thanks to its increasing usability and its decreasing costs. In our project, we have adopted a Serious Gaming approach based on VR to treat phobias. The idea is to immerse patients in a “Phobic Environment” while controlling the phobic intensity. A phobic environment is a 3D world where the patient will be facing “Phobic Objects” and/or “Phobic Events” with the aim to master his fear and reactions. This approach has already been psychologically validated and has already been extensively used through real environments. The virtualization use only enables reducing constraints (cost, time, availability, danger) linked to facing and working within actual situations.

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Several projects have already tried to use this virtual immersion approach to treat phobias and the results are very encouraging. However, the majority of these projects have focused on a particular phobia and have produced a 3D environment specifically related to this phobia [1, 2]. This approach conveys a huge problem in terms of adaptability to multiple patients and of generalization to other phobias. The originality of our approach is that we have targeted the design and development of a generic solution to treat various phobias and to tailor treatment sessions for various patient profiles.

Our approach is based on a generic model of phobic environments. Indeed, we consider that a phobic environment is a blend of various essential components among which we can mainly mention the physical setting, the sound effects and Phobic Objects. A phobic object is often the basic element to be considered since it is the element associated with the treated phobia. For example, for a vertigo-related phobia, the phobic object can be a balcony, an elevator, or a platform. For agoraphobia, the phobic object can be the crowd. Several features characterize phobic objects, which enables to cover a variety of phobias, patients' profiles and different therapy progress degrees. In the example of vertigo, a balcony can be characterized by its size, its materials, its height, its stability, and so on. By changing these features we can vary phobic situations in terms of intensity and it thus makes incremental and progressive treatment possible.

In addition to the diversity of characteristics that may be associated with a phobic object, we also separated two kinds of features. Indeed, our approach distinguishes static and dynamic characteristics. On the one hand, we have the static characteristics that can only have one specific value from a possible set, but which does not change during a session; and on the other hand we have the dynamic characteristics that have some related behaviour. Again, if we take the example of vertigo, a static feature is the material used for the balcony (wood, metal, glass) whereas the dynamic characteristic is the height, which may vary during a session by placing the patient at different heights during the same session.



We have various other elements in our model we can't list in such a short article, such as the notion of "Safe Space" (an escape frame for a panicked patient to calm down), "Personal Environment" (customized framework to put the patient in confidence in early sessions), and so forth. The solution that we have developed is generic and gives, once a phobia has been considered, the therapist a wide range of parameterization and configuration to create, customize and manage his patients' sessions. Therapist intervention during sessions is also possible to deal with unforeseen or unexpected situations. While adding a new phobia requires a minimum work (modelling, graphics), the overall solution is still valid and usable. Our solution can be viewed as a generic engine to play phobia-related therapy sessions. Due to project limitations, we have only considered so far a small number of phobias and we are currently testing our solution with therapists to validate our global approach, its acceptability and its extensibility.

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3 | HOW SGS CAN HELP FIRST AID SERVICES

Dominique Correia

HE-Arc Santé, HES-SO, University of Applied Sciences of Western Switzerland
Contact: domingos.correiaoliveira@he-arc.ch

How is it possible to increase the chances of survival in a critical situation? It has been shown [1, 2] that the weak link in *the chain of survival* (consisting in early access, early CPR, early defibrillation, *early advanced care* and *post resuscitation care*) is indeed the very first link that corresponds to the emergency call for help, *i.e.* “144” in Switzerland. Undeniably, proper response to an emergency is a nontrivial task as beyond the medical first aid knowledge it requires self-control, scene observation, potential of initiatives, and effectively convey the relevant and accurate information to the 144. In response to this problem, this project proposes to develop a computer prototype serious game. Indeed, serious games have shown to be particularly effective in many fields, especially in health [3, 4].

This project is part of the *Vaud cantonal program of health promotion and prevention of children (0-4) – Parents* – with the desire to create synergies between Health, Social and Engineering sectors. To accomplish this objective, our project has focused its software development based on the AGILE methodology [5]. The main idea behind this methodology is to progressively develop a prototype keeping customers and software teams as close as possible making a product that gradually converges to an optimal solution.

In our case, by achieving each level and getting an assessment of its strengths and weaknesses through a scoring system, the player can gradually reach higher difficulty levels. For instance, the player (1) can achieve levels of higher difficulty based on scenarios from the script and (2) get an assessment of its strengths and weaknesses at the completion of each level. Our target audience profile is the early childhood professionals, as it is of first importance for them to train regularly their ability, handling first-aid situations involving children. The *HE-Arc Ingénierie, HES-SO, University of Applied Sciences of Western Switzerland* had the opportunity through an inter-field research project to offer a SG prototype that enables users to provide aid techniques playfully: observation, decision and information relevance at 144. Mainly described by around 50 test-participants as *intuitive* and *fun*, the game was professionally designed according to international guidelines of the AHA (American Hospital Association).

The SG prototype we have developed consists of two virtual reality scenarios (*i.e.* currently set as level 1 and 2) to train early childhood professionals in emergency situations: level 1 consists in taking care of a child with a finger stuck in a door and level 2 deals with a baby suffering from a sudden cardiac arrest.

Both scenarios take place in a child care center where the user can choose what actions to perform among a set of possibilities, like the CPR technics, AED use or simply the choice of materials in a pharmacy. Becoming familiar with the localization of the victim and the exits is one of the goals. The system includes verbal aspects of communication like properly answering the questions from the emergency call center and communic-



ating the accurate information at the appropriate time. The objective of this aspect is to reduce the possibility of forgetting basic information like the address or the entry code. Teaching them how to use 144 in an emergency could be one of the simplest but most important experience. The system enables to apply medical equipment to virtual patients and choose the good reanimation algorithm.

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CONCLUSION

What can be concluded from your point of view? At the moment, there are only partial results because the application is in a pilot phase. Whatever, the users say the interface is appropriate, easy to use and that we can also learn while playing. This project proves that is possible to enrich and increase first aid education through the introduction of information and communication technologies.

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4 | OCCUPATIONAL HEALTH: CURRENT AND FORESEEABLE CHALLENGES. CAN SERIOUS GAMES HELP PREVENTION?

Vera Bustamante

Département de médecine, Unité santé et sécurité au travail, Centre Hospitalier Universitaire Vaudois (CHUV)
Contact: Vera.Bustamante@chuv.ch

CONTEXTUALIZATION

Occupational health issues include a wide variety of areas: from physical safety aspects to psychosocial risks, through exposures to hazardous substances, postural constraints during activity and more. The issues vary according to the type of activity, but also from one country to another. Globally, the International Labour Organization (ILO) argues in developing countries for Decent Work that combines access to full and productive employment with rights at work, social protection and the advancement of social dialogue. Some issues are common to all worldwide: stress [1] for example affects all workers although it is expressed differently in different cultures. Musculoskeletal disorders, which are another example, are also closely linked to stress. On the one hand, significant changes in management types and new technologies may be opportunities for more efficient work. On the other hand, these changes can generate new constraints to which individuals must adapt to meet the demands of modern working life. These are new challenges to be taken up by occupational health professionals.

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THEME & OBJECTIVES

This paper gives an overview of current occupational health issues in Switzerland that could be subject of serious gaming development: professional accidents, psychosocial risks (stress, psychological or sexual harassment), workplace conception, work schedules and balance between private and professional lives. These topics have been highlighted by Federal and Cantonal labor inspectorates who are responsible, among others, for workers protection laws.

CURRENT THEMATIC PROPOSALS FOR SERIOUS GAMING DEVELOPMENTS

Occupational accidents — the most frequent occupational accidents [2] in Switzerland are: falls (for example due to slips, hit by something, or hit something), cuts (to be cut or bitten by something), overwork (temporary or permanent), contact with harmful substances (hot, cold, corrosive or toxic). Can we seriously game to prevent them or analyse them for future improvements?

Psychosocial risks — the actually highlighted problems are: interpersonal conflicts, professional or sexual harassment, stress and burnout. Several factors are identified as risk generators, such as lack of: task variety, work utility perception, autonomy and empowerment, social interactions, development possibilities [3]. How could a serious game help in these complex situations?



Risks related to the conception of work systems — in this field, the current main themes are:

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- › physical ergonomics: physical layout including workspaces, *i.e.* open space office, work tool design or choice;
- › cognitive ergonomics: adequate communication systems, software ergonomics;
- › organizational ergonomics: time schedules, work rhythms and tiredness, and process adequacy.

The imbalance between private and professional life — in this field, the current problems are: effects of new organisation types (teleworking, nomadic working, job-sharing), social changes (discriminatory treatment, individualism), workaholism, workload (dosage), boundaries blur between private and professional activities.

PERSPECTIVE

All topics presented can probably benefit from serious games. These are issues where serious games could be used during the activity itself or professional training.

What type of serious game can be envisaged for these themes? How to involve workers in a serious game when the workload becomes higher, the information flow is speeding up and when everybody is in a hurry? Do serious games worsen the blurring between private and professional lives?

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ROUNDTABLE

SERIOUS GAMES & SILVER TECHNOLOGIES

This panel discusses chances and risks when applying serious game elements to the health sector with ageing (*i.e.* Silver Tech) and addresses important questions: How much fun should a serious game contain? What types of motivational structures are used? How are complex multi-disciplinary teams handled in the planning and (post-)production process?

Digital learning has made huge steps the last decades towards a well-established and widely adopted teaching and learning technique. E-Learning platforms and MOOCs are becoming standard tools for schools, universities and firms. However, the major challenge for these tools and techniques is to maintain the student attention and stimulate their motivation during a learning session. SGs bring strong elements to address the attention and motivation challenged in digital learning. Serious Games, which are a kind of computer games, naturally, capture the attention of students, especially those of the Y-generation who grew up with computer and video games. Fun and challenge, the two key features of a computer game, are almost native motivators for students to spend hours in front of a computer game. And what if we used these natural motivators to reinforce the link between the student and the subject to be learned? The next papers will present some concepts and examples applying serious gaming in education.

1 | AN ENTERTAINMENT GAME USED TO EXPLAIN GENETICS IN CLASS

Philomena Schwab, Severin Walker, Laura Reber, Micha Stettler

Team Niche, Zurich

Contact: Philomena Schwab hi@philo.me

CONTEXT

Niche is genetic survival game which is an entertainment game on the scientific topic of population genetics. The first version of *Niche* was created during a procedural generational course as a semester project. An extended demo was developed as a Bachelor thesis in the Game Design department at the Zurich University of the Arts. *Niche* is inspired by other genetics related games such as *Creatures* [1], *Spore* [2], or more recently *Species* [3] — not to be mixed with strategy based related video games such as *Dominant Species* [4]. The game has been developed using Unity, a multi-platform game engine. The development is supported by Pro Helvetia.

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THEME & OBJECTIVES

Players are in charge of a small population of fox/raccoon/cat/deer-like creatures. All main mechanics of the game are based on the five pillars of population genetics: natural and sexual selection, genetic drift and flow and mutation. The player starts with a small group. Animals are capable of different interactions with their environment. The specific interactions an animal can perform are dependent on its genes. Genes can be passed onto the next generation using a system that comes close to realistic heredity. Genes can be dominant, recessive, co-dominant, completely or incompletely dominant. Animals in the game are constantly aging so the player needs to keep raising the next generation and make sure the gene pool stays intact.

The game main goal is to keep the species alive against all odds. Many dangers threaten the group survival: weather changes and natural disasters force the player to migrate their animals to new, unknown lands and adapt to their characteristics. Predators lurk in the dark and wait for the player to take a false step. In order to face all these dangers, the animals work together as a family. They share their food and protect each other. Coming up with a survival strategy is up to the player. There are many different approaches to survive in this harsh world. With predators, for example, the players might want their animals to evolve great camouflage and reduce their body odor so that they will not be spotted. Growing horns, fangs and claws would be another idea. There are plenty of other approaches, such as evolving a toxic skin or a higher reproduction rate so that one animal can simply be sacrificed to the predator each day. Winning the game requires from the player that his species inhabit all the islands of the game world. This part of the game world was inspired by Darwin's finches. Most of the islands in *Niche* are procedurally generated, which means that they will look different at every play through. This gives the game a lot of replay ability value. Population genetics has been an inspiration to build the games core-mechanics. Still, teaching science is not the game's intention as there are no learning-milestones included. The game's design was laid out to be purely fun and entertainment.



At some point in development we had to decide whether the game should stay in a realistic context (our fox-like animals can only have mammal-like traits) or if we should open up for more fun and fantasy elements (our fox-like animals can also have traits from other species, like a scorpion tail or fins). We then decided to include more unrealistic elements because it increased the fun to play around with genetics and coming up with new weird things. Despite these facts, *Niche* is now used by Biology teachers to explain topics related to heredity, genetics, natural selection, sexual selection, genetic drift, genetic flow, mutation and evolution.

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RESULTS & PERSPECTIVE

Niche has travelled across the world and has been shown at many exhibitions. A lot of feedback from different culture and age groups was collected and used to improve the game. The game is still in development, but has already been picked by biology teachers for a classroom use. The feedback has been highly positive and proved us that games used in school contexts don't have to be designed as learning experiences. As *Niche* appeals to players who focus on entertainment games, it has a much broader audience than educational games usually have. The game will be sold on the digital distribution platform Steam as well as on the Android and iOS App-Stores.

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2 | FROM SG FOR CRIME SCENE COORDINATION TO A REFLEXION ABOUT THE ROLES OF IMAGES IN POLICE ACTIVITY

Olivier Delémont¹, Romain Voisard¹, Dominique Jaccard², Michaël Meyer³

1: École des sciences criminelles, University of Lausanne

2: HEIG-VD, HES-SO, Yverdon

3: Institut des sciences sociales, University of Lausanne

Contact: Olivier.Delemont@unil.ch

CONTEXT

CrimeSim is a serious game that has been developed in collaboration by the École des sciences criminelles (ESC) of the University of Lausanne, and the Haute École d'Ingénierie et de Gestion du Canton de Vaud at Yverdon-les-Bains. Based on the WEGAS platform developed by the HEIG-VD, HES-SO, *CrimeSim* runs a scenario setup and implemented by the ESC from an actual situation. This serious game is used within the framework of the course of crime scene coordination in the Master degree in Forensic science at the ESC. It aims at providing an environment where students can deploy their knowledge and professional skills in a collaborative problem-solving approach, recreating the interactions and constraints of an actual investigation process following the unlikely discovery of an unidentified dead body.

THEME & OBJECTIVES

CrimeSim puts a team of players in the position of the head of a forensic police unit that is faced with the choices to provide clues and intelligence to assist a criminal investigation. Mirroring constraints of real situations, the players have limited resources in terms of time and money at disposal, and they are not able to process all the items. Moreover, the time required by the analytical process to extract information from a sample is also considered. Taking into account all the constraints, a team of players has to extract information from samples collected at the crime scene and to put it in perspective with the elements that other types of investigations (testimonies, hearings, etc.) may reveal. Interactions with investigators and other specialists involved in certain stages of the investigation is implemented through a service of emails integrated into the serious game platform.

The objective to use *CrimeSim* is to go beyond the strict professional knowledge and deploy it to a real context. Upon the bed of forensic-led decisions that students are used to taking to orientate the traces detection, the serious game adds a layer of operational decisions that are driven by constraints and needs of the investigation. In order to provoke fruitful reflexion among students, two levels of discussions are implemented in symbiosis with the serious game. First, as the role of the head of the forensic unit in *CrimeSim* is attributed to a team of players, a dialogue among them precedes any decision. Then, at specific milestones during the course of the game, the different teams have to meet in plenary sessions to compare their strategies and choices. These meetings, taking place in the real world, represent activities that encompass the simulation of the serious game and provide an evident pedagogic added-value.



RESULTS & PERSPECTIVE

So far, about a hundred or so students have played with *CrimeSim*. The usage of this serious game has largely met the expectations of both tutors and players. Yet, unlike suggested by its name, *CrimeSim* is far from a “simulation video game”. It is mainly based on reflexion and abstraction and almost totally proscribes the use of images. At first glance, this concept may seem weird both for a game and an application in forensic science (images are a core element in forensic science). But on the contrary, this near absence of visual information supports forces the players to reflexion and mutual exchanges, while images tend to favour personal interpretation and projections.

CrimeSim also brings some contribution to a more general thinking about the multiple roles of images in relation to police activities. Whether serving surveillance, documentation, testimony, evidence or promotion purposes, images play an increasingly important part in police actions. This pivotal role of images — of, in and for police — constitutes a challenging field of study, which has attracted the interest of researchers at the University of Lausanne in a transdisciplinary perspective.

3 | PEGASO – A SERIOUS GAME TO PROMOTE HEALTHY LIFESTYLES FOR TEENAGERS

Stefano Carrino¹, Maurizio Caon¹, Elena Mugellini¹, Antonio Ascolese²

1: HumanTech Institute, HEIA-FR, HES-SO, Fribourg

2: Imaginary SRL, Milan Italy

Contact: stefano.carrino@hes-so.ch

CONTEXTUALIZATION

According to the World Health Organization Childhood obesity is one of the most serious public health challenges of the XXIst century. The problem is global and is steadily affecting many low – and middle – income countries, particularly in urban settings. In addition, overweight and obese children are likely to stay obese into adulthood and more likely to develop non-communicable diseases like diabetes and cardiovascular issues at a younger age. Addressing this global issue presents a continued challenge with respect to both the design and validation of interventions that seek to impact lifestyles towards healthier futures.

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THEME & OBJECTIVES

The PEGASO project aims at exploring and evaluating different novel mobile services (including a food diary, wearable sensors, tailored messaging and gamification mechanisms [1]) towards the goal of stimulating lifestyle changes in adolescents aged 14–16. Within such a context, games are seen as a crucial *behavior change technique* for both stimulating healthier behaviors and motivating engagement with the overall platform services [2]. The objective of the PEGASO serious game [3] is to explore novel intervention possibilities toward healthier behaviors offered by novel mobile and wearable technologies. For example, the PEGASO serious game rewards are not only provided for the actions that the player performs in the virtual world but also for the completion of healthy tasks in the real world (e.g., doing sport, eating healthily, etc.). The “Energy” mechanic within the game provides a central system seeking to achieve this. The player consumes energy in-game levelling up and fighting enemies. This energy bar can be replenished achieving a daily target behavior that the player has to choose at the beginning of the experience. Without energy, the player’s progression and abilities are limited and unable to increase; therefore, whilst the player can continue to play and acquire nutritional knowledge, the character results are limited until the user accomplishes some specific behaviors in the real world. For instance, if the user walks more than 12,000 steps in a day, the energy bar of the character in the game will be fully replenished. As additional mechanism, a “research activity” within the virtual world is designed around a survey of nutritional knowledge, shown to correlate to healthier lifestyle and has the objective to augment the knowledge of the player about healthy alimentation.

RESULTS & PERSPECTIVE

In several occasions, the game prototype was presented to small focus groups of adolescents in 4 pilot locations: Italy, Spain, England and Scotland. Goals of these activities



were to evaluate the acceptability of mock-ups and functioning prototypes, collect feedback on user experience and evaluate aesthetical options. Users described the energy mechanism as a unique and interesting feature. Overall, the findings from these focus group activities show encouraging responses with respect to the energy mechanism and its use to promote engagement. However, more extended test sessions should be done to find a meaningful balance of entertainment, education and efforts in the real world. Additionally, via the integration of the game within an ecosystem of services, it will be possible to evaluate the impact of a serious game in cooperation with other interventions. If validated, this approach will provide an appealing alternative to encapsulating an entire behavior change model within a single game, reducing the complexity of the game design. Starting in October 2016, the PEGASO ecosystem, including the serious game, will be tested in the 4 pilot locations by 400 teenagers, for a duration of between 6 and 9 months. This pilot aims at analyzing the impact of the system on the user behavior, motivation and engagement on the long term. This research project has been supported by the European Commission under the collaborative project PEGASO (“Personalised Guidance Services for Optimising Lifestyle in Teenagers”) funded by the European Commission under the Seventh Framework Program, FP7-ICT-2013-10.

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4 | A SERIOUS GAME TO TEACH DESIGN TO CHILDREN

Florence Quinche, Denis Leuba

UER Médias et TIC dans l'enseignement et la formation, Haute École Pédagogique Vaud (HEP VD), Lausanne
Contact: florence.quinche@hepl.ch

This educational Serious Game (SG) is a common project between *HE-Arc Ingénierie*, *HES-SO*, University of Applied Sciences of Western Switzerland (*Image processing & Computer Graphics Group*) and University of teacher education (HEP Vaud, Art and technology Dept.) in Lausanne. The Swiss-French school curriculum (PER) includes the integration of media, technologies and information and communications technology (MITIC) in education, and thus from the first schoolyears in all disciplines. Our hypothesis is that playing SGs could be an efficient way to integrate media and technology in various learning areas. The potential of such games has already been studied and outlined, especially to develop children's autonomy, enable a better differentiation in heterogeneous classes as well as motivate the pupils [1]. Although SGs are not very common in Swiss primary schools, we can find them sometimes in domains such as languages, maths, geography, and cyberbullying prevention. In France the academies propose a wide selection of games and pedagogical suggestions on the internet (i.e. <http://jeux-serieux.ac-creteil.fr>). In French Switzerland, the applications offered to schools [2] are extremely limited and mostly concern maths and languages. The proposed games (such as *Gomaths.ch* or <https://memot.rpn.ch/voca/jsp/index.jsp>) are quizzes, based on behaviourist learning schemes, (i.e. learning and repetition) or online exercises (<http://matoumatheux.ac-rennes.fr>) which do not really differ from classical paper problems.

In sciences and geography, where many interesting games exist [3], developing systemic thinking and cause and effect analysis, the only game proposed by the portal is *objectif-sol.ch* (see www.bodenreise.ch/lift_v2/fr), which is rather an interactive website. Several reasons could explain the low use of SGs. First of all, very few games are designed for a classroom use and most of them are not specially adapted to Swiss school programmes. But also, most of the teachers have not received in their professional training neither skills nor examples on how video games could be a powerful tool in their teaching activity. Even if they belong to a generation that played with this type of games, they often have no idea of where to find pedagogical games. Worse, most of them still have misrepresentations of video games as they only know commercial ones and/or consider them only made for pure entertainment. In most of the classes, pupils can only play a game when they have finished all "serious" activities, as a kind of reward, but not as a real time for learning. It is clear that young teachers are not necessarily more innovative, as they tend to reproduce what they have seen in their own education. To integrate ICT in the teaching of manual and creative activities (ACM) we imagined and designed a game platform where pupils would learn several useful abilities to imagine and design 3D objects. Our main targeted audience are pupils between 7 and 12 years old. This game aims at helping them develop 3D perception skills and cognitive abilities, in particular for creative and engineering thinking. Lavergne and Boudier [4] refers to Bloom's taxonomy to classify the corresponding types of gameplay in SGs. Our project corresponds to the second (Analysis) and third (Evaluation) levels and it relates these kinds of competences to strategy builder gameplay and puzzle games.



Currently, primary teachers have very little teaching material to develop that kind of specific capacities. In Switzerland, more than 80% of the primary teachers are women (OFS 2015) who are unfortunately tempted to avoid technical and scientific activities. That's also why we should provide them with an accessible way of teaching this domain. Using a SG to learn to create 3D objects, will provide a strong help in matters they don't feel comfortable teaching. The game structure provides a learning structure, where the children can progress at their own rhythm and receive direct feedback. Examples of teaching sequences, where the game results are integrated to manual activities, will also be provided. In the game, the pupils discover the different stages of a three dimensional object-building process. Several learning skills are necessary, some of them are perception abilities, some others are more conceptual. Progressive steps of problem-solving activities are proposed and many of the corresponding skills could also be useful for other planning activities. The interest of using a SG consists in the fact that the teacher can receive a feedback on the pupil's results and get a synoptic view on his difficulties during the learning process. The image renewal of this field is the other aim of this innovative way of introducing manual and technical activities. Last but not least, this tool will offer equal learning opportunities especially gender equality as it should strongly raise the children interest, in particular girls, in or technical disciplines.

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ROUNDTABLE

SERIOUS GAMES & INTERNET OF THINGS

Most of existing games rely on purely virtual environments to increase the immersion of players and, thus, enrich their user experience. More and more initiatives tend to explore the hybrid physical-virtual game worlds and environments with the objective to reach a different user experience through combined virtual and physical player interactions. Connected physical objects are a promising approach toward these new kinds of hybrid interactive games. The round table aims at discussing the Internet of Things as an enabler of this paradigm shift.

SESSION SOCIAL

13H-14H30

Software has become ubiquitous in all human activities, both individual, collective and social ones. Initially, software was largely focused on management and optimization with a passive role for the end user. At present, Software has evolved to sustain social activities with plenty of collective and cooperative functionalities such as dialogue, interaction, communication, data sharing and notification, allowing the emergence of social-oriented applications and services. Within this framework and with all the available communication, visualisation, and interaction technologies, Serious Games could really bring an added value in various social areas such as health, education, social inclusion, democratization, ecology, transport, and so on. In all these areas, Serious Games could be used to support training, education, sensibilization, information, inclusion, cooperation in a more efficient way comparing to classic Software.

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CHAIRMAN: YASSIN REKIK

1 | MOTIVATION DESIGN IN IMOMO: CREATING MOTIVATION CYCLES FOR CROWD WATER SOURCING IN TANZANIA

René Bauer

Gamedesign ZHdK, Zurich University of the Arts
Contact: rene.bauer@zhdk.ch

The iMoMo-Project goal (Innovative Technologies for Monitoring, Modelling and Managing Water, www.imomohub.com) is to develop high-tech but low cost methods for water management. The iMoMo project is funded by the Swiss Agency for Development and Cooperation (SDC, <https://www.eda.admin.ch/sdc>) and headed by the Haute École de gestion Arc (HE-Arc, HES-SO, www.he-arc.ch) of Neuchâtel. The main partners in the HE-Arc, HES-SO consortium are Hydrosolutions (www.hydrosolutions.ch) and the Zurich University of the Arts (ZHdK Game Design, www.gamedesign.zhdk.ch). The project started in 2011 in Tanzania (Africa) and was later extended to Central Asia.

Water management covers monitoring, collecting water data (measuring), creating water models (how and how much water flows), distribution planning, water usage (river water, ground water), consumption planning and basics for decision making (crop calendar and so on).

The iMoMo project started in 2011 in Arusha (Tanzania). Arusha's water cycle begins with rain water on the Meru mount, which runs as a river or ground water through the town of Arusha and further downstream into the ocean. Water issues like wrong and unfair distribution are managed by different water organizations and the distribution by canals (river committees). However, on site, there are only water measuring methods, which rely on comparing water levels (sticks), no absolute water measurements (no meteorological stations and so on) nor a detailed water model are available.

The consortium did a lot of research in this field and created a mix of meteorological stations and crowd sourcing technologies (special sticks, mobile phones) to collect water data for a water model.

The key problem was to motivate people (like farmers or river committees) to collect data (even with their own mobile phone). iMoMo had to implement more than just technology to be sustainable. Water management had to become a part of everyday life and culture. Therefore Game Design ZHdK developed several layers for motivation in collaboration with the project anthropotechnicians: long- and midterm (board games, electronic games for schools) and the water data collecting game (channels: smartphone-app or sms/usd-app).

First, we decided to bring the meteorological stations to schools thus protecting them from vandalism and making them available for education (gathering information). Second, we developed two board games for the schools. In the *Shumbara* game you have to guide water as fast as possible through channels to your village — conflicts are built-in. For the older pupils we introduced *Meru* — a cooperative game with marbles — where you have to bring rainwater to all of your fields by changing the topology. Through these channels we could also reach mothers. The last step in the long-term motivation structure was a simple action web game about a river and pollution.



Furthermore, we implemented the collecting “game”. Like in all other parts, we used a classic motivation approach coming from game design (motivation cycle): challenges, options, choices (playing) and reward or punishment. We developed a tamagotchi game and versions for sms/usd (sms are used from almost everybody). The challenge is to feed the avatar — a bird (in Tanzania also a bio indicator of the rain season) with water data (how much it rains, how long, etc.). If you don’t manage, it gets angry. If you can feed it with data, he first rewards you with funny animations, happiness and with a virtual journey through Tanzania. There is another rewarding system, which allows the player to send & receive messages and receiving actual news and crop calendar. This closes the motivation cycle and brings back the collected data as helpful rewarding information.

At the end of the project, some of the products (like the board games) had to be abandoned — not because they failed in the focus group, but because the priorities of the project changed.

2 | ACCOMPANYING THE DYING, A DAILY LIVING FOR YOUNG NURSING PROFESSIONALS

Pierre-Alain Charmillot

HE-Arc Santé, HES-SO, University of Applied Sciences of Western Switzerland, Neuchâtel
Contact: Pierre-Alain.Charmillot@he-arc.ch

Serious Game is a novel and suitable tool to support young nursing professionals in the difficult task of accompanying dying people.

A game to help students care for dying patients? Seriously? It is a sensitive issue because it is a reality faced daily by nursing students. Demographic data shows that in the coming decades there will be a significant increase in deaths, particularly among the elderly with poor health. This poses a major challenge for healthcare professionals across most of Europe, and Switzerland is no exception.

The majority of students are young adults who have had less and less exposure to the realities of death and ageing during their early years. Three main factors contribute to this: the distance (physical and emotional) between a family's older and younger generations (great grandparents' death); the younger generation's lack of involvement in the death of older family members and the professionalization of care at the end of a person's life (more people die nowadays in medical institutions and alone). Furthermore, the media continue to promote youth and the illusion of immortality, further distancing us from our own mortality. In contrast, young nursing students must face the reality of death early in their clinical training. Students express feelings like dread, abandonment, helplessness and anxiety, difficulty in coping with their emotions, suffering and pain, and shock at seeing a dead body [1, 2, 3]. These reactions can hinder the student's relationship with the patient [4].

The sensitive nature of interpersonal skills development in young students suggests the use of teaching methods that go beyond the mere transmission of theoretical knowledge. These abilities must therefore be taught. A relationship, particularly in the context of a patient at the end of his life, requires considerable knowledge and self-awareness that overlaps both private and professional spheres. This personal aspect in the development of a professional relationship requires working on oneself, which affects intimate dimensions, including those related to attachment and loss. Such introspection thus conditions the development of feelings such as empathy, rapport and compassion. The curriculum at HE-Arc Santé, HES-SO, includes various pedagogical methods that help students develop their relationship skills. Teaching begins in the foundation year and continues throughout the undergraduate course. This curriculum, which is designed for small groups of 15 to 18 students, integrates various modules that vary between theory, role play, clinical, emblematic and problematic scenarios, real-life situations and patient simulation. However, the focus on supervised group work leaves little room for a more personal, less oppressive and thus more effective approach. On the assumption that, due to the intimate and personal nature of death, group learning may not be the most effective way of developing relationship skills in this area, it is essential that students also get a complementary and alternative training.



Why not reconcile the various parameters to devise an innovative, funny and educational approach that caters for the needs of the undergraduate population? We believe that a Serious Game (SG), where students are immersed in a virtual reality and face the scenario of caring for a dying patient, is a useful teaching aid. However, to date no study has analysed whether this tool is sufficiently realistic and effective to motivate students to experiment and develop their relationship skills. Moreover, the most appropriate immersion level and type of environment for this learning method have yet to be defined. Does an immersion comprising photos and text produce a similar or a different effect from an immersion consisting of virtual reality via an HMD with spherical projection of film clips? Which environment offers intimate and secure enough conditions to motivate students to begin a relationship?

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3 | GAMIFICATION OF REAL LIFE

Spyridon Nompilakis, Alexandre Serex

Wake App Association (W.APP.A), Lausanne
Contact: spyridon.nompilakis@gmail.com

CONTEXTUALIZATION

Great Sam [1] is a web application developed by Wake App Association, a Swiss-based collective with the goal of promoting communication and social interaction through modern technologies. The application enables users to create quests on an online platform for other users to select and complete in real life, in return of a reward. Quests may be as genuine or as trivial as one wants, since all content is user-generated. They might be as simple as helping an old person cross the street or as complicated as solving ten quizzes hidden in different locations before gathering all the necessary information in order to retrieve a lost artefact from the edge of the world. Rewards may equally be both virtual and real, from xp and level ups to real objects of value, promised by the quest creator.

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THEME & OBJECTIVES

The initial idea came from Role-Playing Games, where, once all the quests are completed, there is no more interest to continue playing the game. Such a handicap could be overcome if users could generate content, thus extending the duration of the game. This, combined with the fact that people nowadays are more and more often held captive in front of a screen [2, 3] (both gamers and non-gamers), led to the creation of a platform that combines real-life quests with user-generated content. Seen in a broader sense, the game can be considered gamification of real life, since anything one does in reality could fall into the scope. One could ask for help to move a couch, whereas another could challenge people to undertake a social activity like cleaning a park or taking a homeless for dinner. The platform offers infinite opportunities for social interaction, since meeting people and offering to others stands at its core. It can be equally used in a broader system like a city or a narrower one like a conference, an event, a festival or a classroom. In the second case quests can be channeled to serve a specific purpose, e.g. learning [4] or marketing [5] and this is where the platform aims to source its economic sustainability. Usage shall always remain complimentary for physical persons, whereas fees might apply for legal entities.

The platform is simple to use and offers three main pages:

One page for the creation of new quests, where the user sets a title, a description, the location of the quest, as well as parameters like time, difficulty and rewards; one page for the search of quests, with a list of all available ones located in a defined area; and one page with the stats of the user, such as level, attributes, number of quests completed or comments from other users with whom he/she interacted.

The objective of the application is to provide users with the opportunity to socialize and interact in real life, while having fun and, all the more, by performing good deeds. On



top of that, it offers a powerful gamification tool, available to serve a specific purpose with a positive impact. Examples of such a purpose could be:

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assisting the educational activities of a university by gamifying the tasks requested by professors; supporting the activities of an NGO by creating quests that would assist it in the achievement of its goals; organizing activities for Corporate Social Responsibility, serving the positive trace of a corporation; activating members of an institution to complete certain tasks; and so on.

RESULTS & PERSPECTIVE

During the Proof of Concept, some 300 users used the platform. Feedback has been very encouraging. Most users were very happy to accept quests already provided, while few took the extra step of creating their own. The target now is to further assess the application in different environments like corporate, educational, leisure or volunteering environment to detect where it best fits and how it could be best utilized. The user motives need to be analyzed as well as the user feedback to be considered. Extra functionalities, like communication means, notifications, social media features or links with other online platforms need to be evaluated, with the ultimate target being the creation of a mobile version of the application and its launch in the app store that would allow an extensive use.

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4 | THE DIALOGICAL DIMENSION OF SERIOUS GAMES

Antonio Iannaccone, Sophie Lambolez

Institute of Psychology and Education, University of Neuchâtel
 Contact: antonio.iannaccone@unine.ch

Usually, laypeople perceive electronic games experience as a kind of playful “individual” activity in which a user interacts with an offline or online device. This kind of “individual” representation of electronic game practices appears in everyday conversations and is often referred to in newspapers and popular scientific publications. In addition, in studies about addictions and other psychological troubles, induced for example by an intensive use of electronic games, a large part of research suggests descriptions and explanations mainly focused on an individual level of analysis (for example, in that scientific attitude arguments are often linked to specific characteristics of the user’s personal dispositions or to software technical features). These “individual” aspects of the representation that ordinary people have of electronic games and more generally of Human Computer Interaction (HCI) fall into a cognitive activity conception that will be decontextually [1] and substantially “monological” [2] defined. Interesting alternative explanations of user interactions with devices and environments are derived from theoretical approaches which are based on a conception of the mind as “situated” and “dialogic” [3]. In the “situated” perspective, the user interaction with the environmental and technological devices is explained by taking into account the wider social and cultural context in which the interaction is developed. In this way, user and device technology are regarded as two interdependent components of a larger system that can radically affect the aims and actions of the participants. The understanding of the interaction between users and technological devices is therefore not limited to the analysis of ergonomic aspects and cognitive processes within the individual-device dyad but rather broadens its perspective to the essential influence that the wider social and cultural context plays. In the dialogic “thinking” perspective, *such as intelligent action and problem solving, takes place in the word, rather than in autonomous, cognising individual brains* [2] — p. 12. According to this epistemological perspective, “takes place in the word” means the human nature is constituted by interaction with others. *Humans are always interdependent with others, although the degree and kind will of course vary with individual, culture and situations* [2]. Compared to these two theoretical perspectives, even when researchers highlight the embodied nature of cognitive activity [4], also activities with electronic games, they do not seem open enough to consider the “social mediated” nature of the interactions between humans and their environments. In fact, according to situated and dialogic perspectives, many of those situations in which humans are engaged in electronic game activities consist of real complex interpersonal spaces that enable participants to: a) exercise social strategies and b) negotiate social identities. Some awareness of the social dimensions of HCI is observable in “serious games” as a special category of electronic games that have the general purpose of solving a problem in a simulated reality (in education, marketing, and so on). Unfortunately, this awareness does not always correspond to a detailed scientific approach that takes into account the interdependence of social and cognitive dimensions of ludic activities.



This paper try to demonstrate that “situated and dialogical” perspectives in psychology [2] can offer interesting accounts of the real complexity of electronic game activities, enabling even to plan some beneficial applications of serious games as “social spaces of activity” [5]. A real “situated and dialogic turn” [6] in research on serious games could consist in moving from the conception of “a solitary and abstract mind that plays” to an alternative idea that considers (real and virtual) social interactions as a fundamental level of analysis to understand the full nature of human activities on serious games. A dialogical perspective lets us consider serious games as an “extended device” that includes both mind and socio-material components of activity [3]. All this seems to have some interesting consequences in the planning of technological environments as well as in the extension of their use to relevant social issues. Finally, it is also worth considering that a concept of “technological space” as activity systems can greatly contribute to the identification of devices that are not limited to the facilitation of individual tasks or the replacement of weakened physical and cognitive functions (for example, the numerous and useful home automation and health care applications for the elderly). In both the situated and dialogic perspectives, devices, considered as “extended minds”, can also be opportunities for human development and improvement of social and communicative dynamics.

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ROUNDTABLE

SERIOUS GAMES & E-CITIZEN

We live in a connected world where the citizen is increasingly invited to play an active role in its social and political environment. Can Serious Games be an efficient tool to help passive citizen to become active e-Citizen? We really think so!

RIGHT PLACE, RIGHT TIME FOR GAMIFICATION

Nabil Ouerhani, Stéphane Gobron

HE-Arc Ingénierie, HES-SO, University of Applied Sciences of Western Switzerland
Contact: nabil.ouerhani@he-arc.ch

CONTEXTUALIZATION

Game and Serious Game industry experience an exponential growth, almost all over the world, but not everywhere. Indeed, the state of Game production in Switzerland has a long way to go in order to catch up with countries such as USA, France or the Netherlands [1]. More specifically, the Swiss Serious Game industry suffers, consequently, from the lack of an ecosystem that stimulates a sustainable growth. Nevertheless, recent initiatives are giving very promising signals towards setting up major cornerstones: new national strategies aiming at boosting this domain. The most important signal is coming from the national parliament where a motion is being discussed to define a Swiss Federal Council policy to stimulate the development of the Swiss Game Industry [2]. Other initiatives like Game Culture [3] and Swiss Game Developers Association (SGDA) [4] are also contributing to the development of this promising industry. Moreover, Switzerland has all necessary ingredients to assume a rapid development of this sector. The Swiss education system produces highly qualified designers, engineers and entrepreneurs who can carry out these strategies.

Based on this promising ground, Gamification and Serious Game Symposium (GSGS) aims at reinforcing the national and regional effort and initiatives to increase the maturity and the visibility of the Swiss Serious Game industry.

THEME & OBJECTIVES

As stated on the first paper of the proceedings, we believe that the Serious Games genre has a tremendous market potential in our country which will become a highly relevant lever to boost the growth of the Swiss Game industry. Several sectors like watchmaking, banking, healthcare, education are showing great interest in using the serious game paradigm.

GSGS is an initiative aiming at increasing the visibility and notoriety of Serious Games at a national level. This first edition represents an important landmark

in the Swiss Serious Game landscape. It will set the cornerstone of a long journey to promote Serious Games in Switzerland. Indeed, the GSGS enables the following:

Corresponding consortium and symposium board committee – the symposium has been a good reason and opportunity to bring together influential players in the field of Serious Game. Composed of academic and industrial actors, the consortium will define a roadmap to promote Serious Games by different means. National and international symposiums and workshops are a way to gather researchers, game experts, art designers and stakeholders and stimulate the exchange of experiences. Bachelor and Master courses will be the lever to prepare the skills that will create tomorrow's Serious Games in Switzerland (see p. 41). Developing the field of Serious Games and gamification implies a subtle balance of various disciplines: computer science, Software Engineering, art & design, user centered design, education & pedagogy. The GSGS board committee is therefore composed of the following members: a SG & computer graphics expert, a software engineering & user-centered design one, a pedagogy & gaming one, an augmented & virtual reality one, several game design and special effects ones. Our intention is to be open for collaboration and exchange with other national consortiums.

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Review committee – the review committee that has been set up for the first GSGS edition to review the submitted paper will act as the technical core team that will define the content and the future technical directions of the symposiums and workshops. It will also act as ambassador of the GSGS at the international level. Its participation to other international conferences and the GSGS activity diffusion contributes to the notoriety of our symposium and consortium.

Cantonal representation – given the federal structure of Switzerland, we should also be active at the cantonal scale to advertise the Serious Game initiatives to the cantonal government. It is of paramount importance to create local acceptance of national initiatives through regional and local projects. The Interreg or LPR («*loi sur la politique régionale*») are good instruments to achieve this goal.

National representation – our ambition is to federate a national representation and be recognized as well as a key player in the field of Serious Games. Therefore, we plan to actively extend the GSGS network making the link from universities of applied sciences to pure academic universities (and EPFs) and to Swiss companies (see figure p. 43).



PERSPECTIVE

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In the following decade, the average age of regular video and computer game players will increase drastically (especially with the young adults – 55~65 y.o. – as new potential key players). The majority of the world population in general and of the Swiss population in particular will be regular game players. This evolution represents a huge opportunity to use games as a medium in a large variety of domains, ranging from education to healthcare. We are clearly at the verge of Serious Games and gamification golden age.

Switzerland must take this one life time chance now and define a clear strategy to embrace these new opportunities. It is also the right time for Serious Game actors and communities to intensify the promotion actions and activities. We strongly believe that this Gamification and Serious Game Symposium has the role to mobilize local communities and impulse a certain dynamic necessary to the creation of a stimulating Swiss Serious Games Ecosystem.

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