International Society for Virtual Rehabilitation

ISVR

NEWSLETTER

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Editorial

April 2017 Newsletter 10

Welcome to the ISVR newsletter for April 2017. This edition features a profile from the Virtual and Augmented Reality Group at Vienna University of Technology that provides an overview of their ImmersiveDesk system. Our rehabilitation start-up profile features an overview of a number of realistic virtual environments developed by Katana Simulations Pty Ltd.

We have included a call for participation by Regame Laboratory who are requesting volunteers to complete a short confidential online survey about the use of VR and video games by therapists.

The 12th International Conference on Virtual Rehabilitation will be held in Montreal, Canada on June 19-22, 2017. It looks like there is an interesting line-up of keynote, platform and poster presentations. For more information, go to http://www.virtual-rehab.org.

We are always looking for interesting contributions to the newsletter. If you would like to share your news, upcoming events or an overview of your research, lab, clinic or company, please contact us at newsletter@isvr.org.

Belinda Lange, Kynan Eng and Sergi Bermudez i Badia, ISVR

IN THIS ISSUE

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UPCOMING EVENTS

11th International Society of Physical and Rehabilitation Medicine (ISPRM) World Congress
April 30-May 4, 2017, Buenos Aires, Argentina
http://www.isprm2017.com/

3rd European Stroke Organisation Conference
May 16-18, 2017, Prague, Czech Republic
http://www.eso-stroke.org

2nd Congress on Neurorehabilitation and Neural Repair
May 22-24, 2017, Maastricht, The Netherlands
http://www.neurorehabrepair.eu

International Conference on Virtual Rehabilitation 2017
June 19-22, 2017, Montreal, Canada
https://virtual-rehab.org/2017/

2017 ISPGR World Congress
June 25-29, 2017, Fort Lauderdale, FL, USA
http://www.ispgr.org/cpages/2017-congress

RehabWeek 2017
July 17-20, 2017, London, UK
http://www.rehabweek.org

AOCNR 2017
August 8-10, 2017, Tagaytay City, Philippines
http://www.aocnr2017.org/

European Congress of NeuroRehabilitation (ECNR)
October 25-27, 2017, Lausanne, Switzerland
http://www.efnr.org

TECHNICAL PROFILE

Virtual and augmented reality group

Hannes Kaufmann
Vienna University, Austria
https://www.ims.tuwien.ac.at/research/virtual-and-augmented-reality

General Information

I'm head of the virtual and augmented reality group at Vienna University of Technology since 2005. With my team of 3 PostDoc and 6 PhD students we conduct basic and application oriented research in all areas related to virtual and augmented reality.

Where is your lab located?

We are located directly in the center of Vienna (4th district). Our new 150m^2 free area walking lab is 3km away from the institute in the 3rd district.

How did it start, how long has it been around?

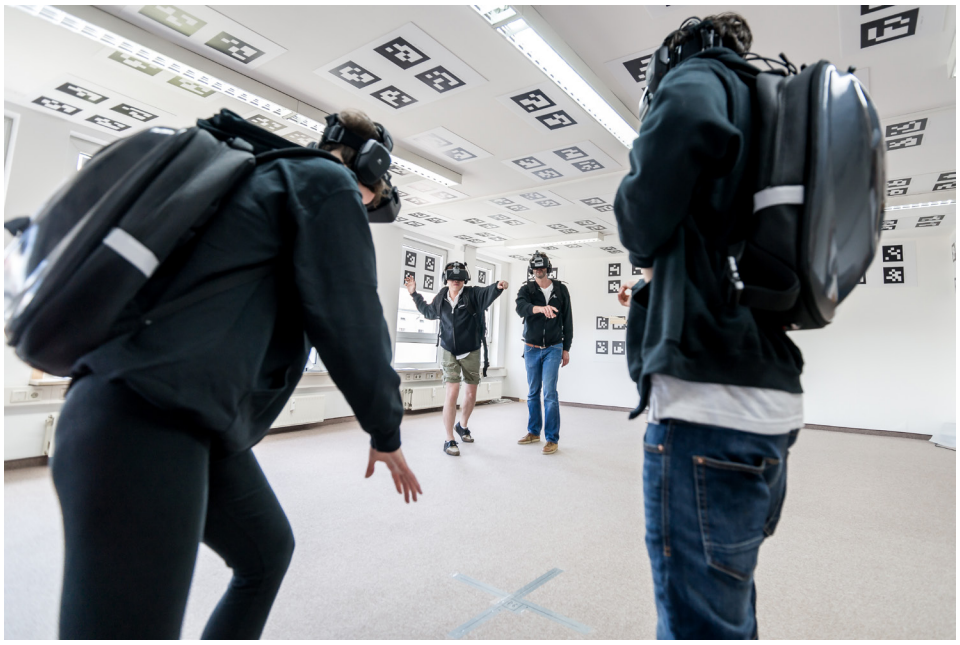
VR and AR started at our university in the mid 90s. Here the Studierstube AR/VR framework was developed from the late 90s to the mid 2000s. I started working in the group in 1999 under my PhD supervisor Dieter Schmalstieg and became head of the group in 2005.

Who are the members?

Head: Hannes Kaufmann. The PostDocs are Peter Kan, Annette Mossel and Christian Schönauer. PhD students: Iana Podkosova, Khrystyna Vasylevska, Emanuel Vonach, Georg Gerstweiler, Soroosh Mortezapoor and Mohammad Reza Mirzaei. (https://goo.gl/e4CyoZ)

What research interests does your lab have?

- Large Walkable VR and Multiuser VR
- 3D User Interaction including Locomotion
- Human-Robot-Interaction in VR
- VR/AR/MR Applications in a wide range of areas e.g. VR/AR Medical Applications & Virtual Rehabilitation; (Immersive) Training Applications; AR Indoor Navigation and many more.
- High Quality Rendering for Mixed Reality



Users experiencing ImmersiveDeck

What technologies you are working with?

We use all available low cost VR and AR equipment, a robotic arm and lots of other hardware technologies. On the software side we use Unity but mostly Unreal these days.
We have 3 labs, one of them for large scale VR experiments (150 m^2 free walking area), the other 2 are room sized.
We have 18 HTC Vives that we use for teaching. Last semester each pair of students got a Vive in the VR/AR lab course for VR application development.

What problem does/do your system(s) solve?

I would like to talk about a system called ImmersiveDeck that we started working on 2 years ago. We do a lot of basic and applied research with it. Videos of the ImmersiveDeck can be found at: https://goo.gl/7nQ66f and https://goo.gl/uKIxt9.

Our "Holodeck" allows free untethered walking through very large virtual environments. It allows exploration and interaction in large virtual environments for a wide range of applications. I see applications obviously in gaming, but a commercially higher potential exists in the areas of training, architectural visualization, marketing, rehabilitation, virtual tourism, virtual museums and others.

We developed our own multi-marker GPU inside-out camera tracking which is very low cost and allows us to cover

TECHNICAL PROFILE

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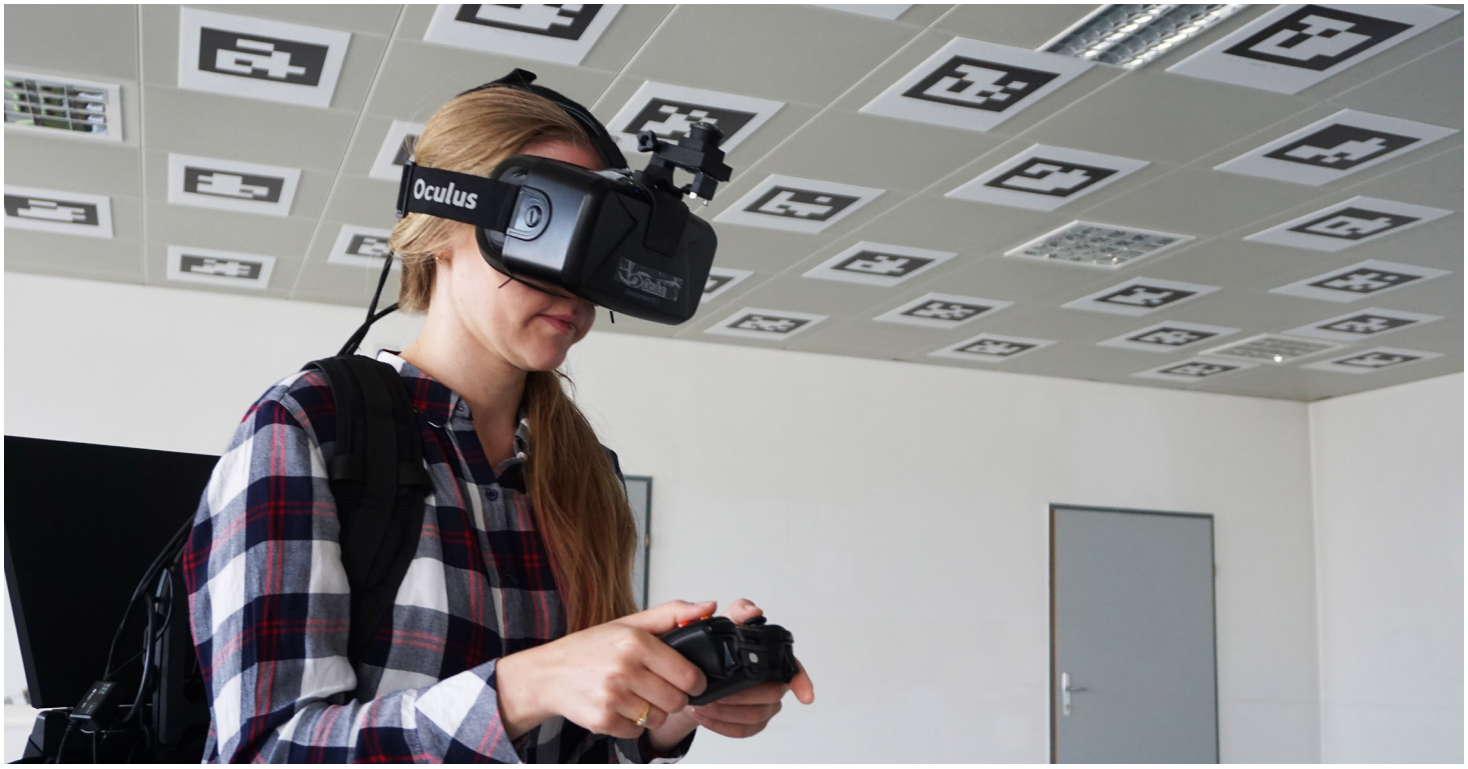


User experiencing ImmersiveDeck

very large spaces at hardly any costs. We integrated multiple devices including a motion suit and render the whole environment locally, on the person on a VR backpack to achieve minimal latency.
(https://goo.gl/f2eR2l)

Currently we conduct applied research projects in the area of training but also do a lot of basic research related to Spatial Compression techniques. It is highly exciting how users can be made to believe that they walk through much larger spaces. Our latest paper provides really interesting results - "Towards Efficient Spatial Compression in Self-Overlapping Virtual Environments" will be presented at the 3D UI Symposium at IEEE VR this year.

We also use our ImmersiveDeck platform to study multiuser behavior in VR where one goal is to study how we can make each user belief that he is in his individual VE while in reality multiple users share the same real room. A first study investigating if users feel the aura or proximity of co-located users in VR was published at EGVE/ICAT 2015 "Mutual Proximity Awareness in Immersive Multi-User Virtual Environments with RealWalking".
(https://goo.gl/h4GK57)

What makes it unique and how is it better than other existing systems?

The uniqueness is that it is very low cost and we can easily set it up in any large room. We can do large scale VR experiments without needing a huge, expensive outside-in camera installation. Since the ImmersiveDeck was developed in cooperation with the German company Illusion Walk, they also sell the system in various versions to researchers or commercial partners.
(https://www.illusion-walk.com/technology/)

Tell us about the development process.

The whole platform was developed in a large contract research project, financed by the company. Usually we work in small teams on research projects but here 6 people worked full time to develop the first prototype. It was a challenge to coordinate but also a great success in the end. Existing game engines really provide high flexibility and functionality to realize such projects in a relatively short time.

What level of readiness is the technology now?

The whole platform is fully functional and used in research projects. It is close to its first use in a commercial project. It is currently TRL (Technology Readiness Level) 7.

Is it available to the community? How to have access to it?

Yes, Illusion Walk is selling the platform, including support, and currently looking for commercial partners to realize commercial projects.

REHABILITATION STARTUPS

Katana Simulations Pty Ltd

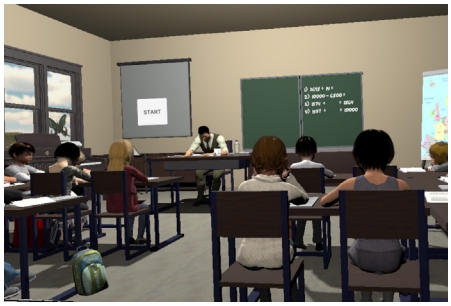
Sebastian T. Koenig, Ph.D.
Founder, CEO
koenig@katanasim.com
http://www.katanasim.com/

What product are you offering?

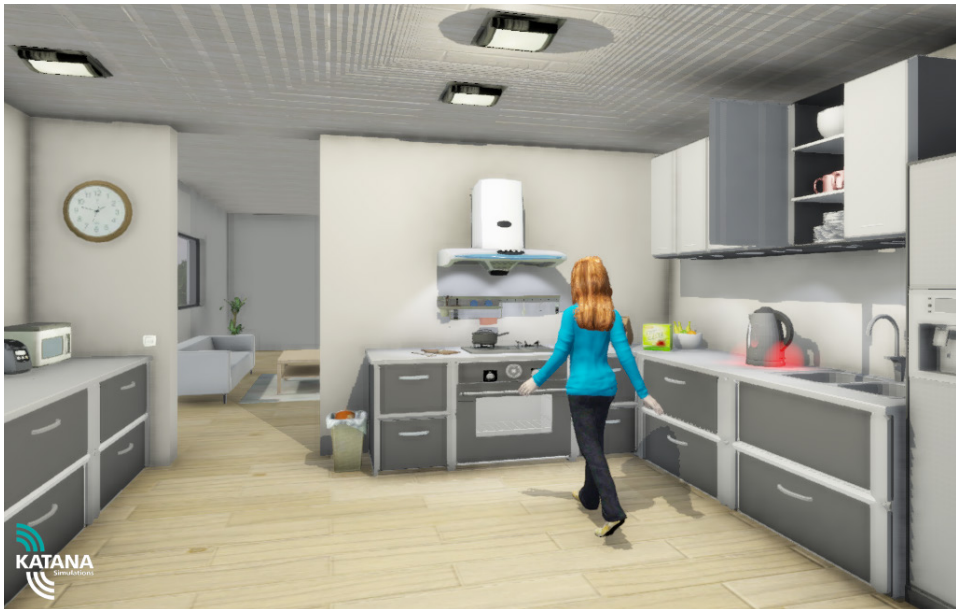
Katana Simulations is designing and developing customized cognitive training modules and assessments for mobile, desktop, and virtual reality platforms. We focus on realistic scenarios such as virtual classrooms, supermarkets, offices, or home environments. Each scenario contains cognitive tasks that simulate activities of daily living like shopping, cooking, classroom attendance, or work-related tasks. Environments and tasks can be customized to the needs of each individual patient, replicating scenarios that match the patient's rehabilitation goals. Our products are currently undergoing clinical testing with stroke and traumatic brain injury patients. Interested researchers and clinicians can contact us to test our simulations, provide feedback, or conduct their own trials.

What is unique about your product?

Our simulations provide a unique approach to cognitive assessment and training by combining cognitive tasks and distractions into complex scenarios. For example, a virtual meal preparation requires the patient to set the table, prepare ingredients and complete all cooking steps while also being confronted with distractors such as a ringing phone or a pet seeking attention. This stands in stark contrast with traditional cognitive tasks that separate task domains and present them individually in distraction-free environments. This task complexity is a much better representation of the challenges patients are confronted with outside the rehabilitation environment. Despite such complexity, our scenarios are standardized and support detailed data analysis for clinical and research use.



VSIM:Classroom



VSIM:Kitchen

How does your product help patients and therapists?

Our products leverage realistic virtual environments and cognitive tasks that mimic the complex demands of patients' everyday lives. This approach promotes skill transfer to real-life and increases patient motivation. Moreover, therapists receive more relevant insights into their patients' performance in the context of resuming work or returning home after rehabilitation. Our products encourage patients to continue training at home by providing remote communication and data exchange with healthcare professionals.

How can one obtain your product and how much does it cost?

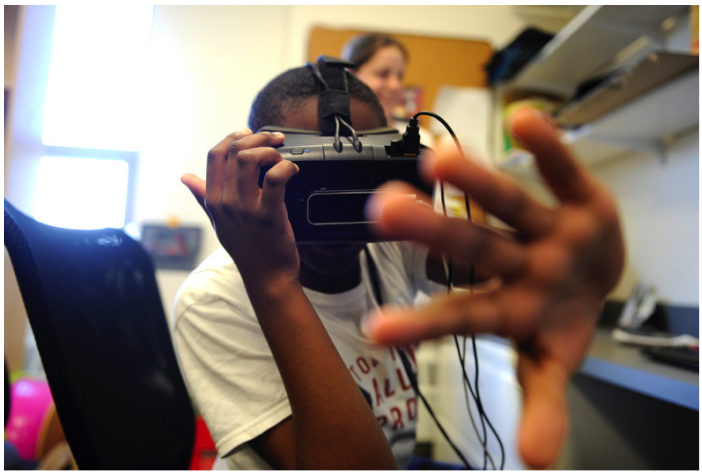
You can read more about our products at www.katanasim.com. We provide customized products to meet our clients' needs.
Contact us at info@katanasim.com to discuss your specific requirements.

CALL FOR PARTICIPATION: US Therapist VR Rehab Survey

regame VR laboratory

Do you use virtual reality (VR) video games in your clinical practice?

Are you interested in using them, but wish you had more information?



RiVERS Lab

Your participation in a short confidential online survey about the use of VR and video games by therapists will help us to identify therapists' VR learning needs in the US.

Even if you are not using VR or therapeutic gaming in your practice right now, we are still very interested in your responses!

Survey participants will have the option of entering a draw to win one of five $50 Amazon.com gift certificates!

Survey link: **https://survey.ubc.ca/s/VRsurveyUS/**

For more information: regamevrlab@northeastern.edu

ISVR Society News

The website at http://www.isvr.org acts as a portal for information about the society. We are keen to to enhance the community aspects of the site as well as to to make it the first port of call for people wanting to know what is going on in the field of virtual rehabilitation and its associated technologies and disciplines. Please do visit the site and let us know details of any upcoming events or conferences or news items you would like us to feature on the site. We intend to add further features in the coming year including member profiles; a directory of journals who publish virtual rehabilitation related work; and a list of Masters and PhD level theses completed or currently being undertaken in the field. As well as sending us details of events and news for display, we would welcome suggestions from members about what else they would like to see on the site, or ideas for how we can further develop the virtual rehabilitation community through it.

Please mail webdec@isvr.org with any information/ideas using ISVR INFO in the subject header.

Membership information

Membership of ISVR is open to all qualified individual persons, organizations, or other entities interested in the field of virtual rehabilitation and/or tele-rehabilitation. Membership (regular, student or clinician) entitles the member to receive reduced registrations at ISVR sponsored conferences and affiliated meetings (see webpages for more details). There is also an active ISVR facebook page, which is another source of useful information, currently with 1148 members.

Call for Contributed Articles

- If you are a technology expert in virtual rehabilitation or you have experience in the clinical use of virtual rehabilitation technologies, and would like to be featured in an upcoming ISVR newsletter issue
- If you would like to submit a contributed article relevant to the ISVR community
- If you have any news, summaries of recent conferences or events, announcements, upcoming events or publications

We are looking forward to your contribution! Please contact us at newsletter@isvr.org.

Join our mailing list: http://isvr.org/join-our-mailing-list/

12th INTERNATIONAL CONFERENCE ON VIRTUAL REHABILITATION

http://www.virtual-rehab.org

Montreal, Canada – June 19-22, 2017

Affiliated with the International Society for Virtual Rehabilitation - www.isvr.org

ICVR 2017 KEYNOTE SPEAKERS

Tiiu Poldma, PhD

Tiiu Poldma is full professor at the School of Design in the Faculty of Environmental Design at the Université de Montréal. Dr. Poldma's research expertise lies in the creation of spaces in flexible and temporal environments using light, color and design elements through changing human user experiences of interior space, and adapting the environment for various populations.

Mel Slater, DSc

Mel Slater is an ICREA Research Professor at the University of Barcelona in the Faculty of Psychology. He has been Professor of Virtual Environments at University College London since 1997 in the Department of Computer Science. He has been involved in research in virtual reality since the early 1990s. He has contributed to the scientific study of virtual reality and to technical development of this field. He has also contributed to the use of virtual reality in other fields, notably psychology (in relation to clinical psychology - studies of paranoia - and also social psychology) and the cognitive neuroscience of how the brain represents the body.

Judith E. Deutsch, PT, PhD, FAPTA

Judith E. Deutsch is a professor of physical therapy in the Department of Rehabilitation & Movement Sciences at Rutgers University. She is also the director of the Research in Virtual Environments and Rehabilitation Sciences Lab. Her research has focused on the development and testing of virtual reality technologies to improve mobility, balance and fitness of individuals with neurologic conditions. More recently she has worked on knowledge translation related to adoption of video games in clinical practice.

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