International Society *for* Virtual Rehabilitation

ISVR

NEWSLETTER

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Editorial

November 2019 Newsletter 16

I hope everybody has had a nice summer. In this issue of the ISVR newsletter, we review the recent events organized by our society, namely the International Conference on Virtual Rehabilitation (ICVR) held in Tel Aviv, an ISVR workshop held at the RehabWeek in Toronto, and a panel organized in collaboration with the the International NeuroRehabilitation Symposium (INRS), also at the RehabWeek. ICVR 2019 was held at Tel Aviv University in July of 2019. We had exciting and inspiring keynote lectures, workshops and informal discussions. Tamar Weiss presents the winners of the awards for best paper, best poster and best student paper on pages 4 and 5 of this newsletter. Dr. Weiss also received the ISVR award for outstanding service, see page 4.

Gerard Fluet describes his personal highlights on page 6.

A workshop organized by the ISVR was held at the Rehab Week in Toronto, titled "Application of current findings from virtual reality research to clinical intervention", which is summarized by Tamar Weiss on pages 7 and 8. In this issue, we also present DokkX, a center for welfare technologies and digital healthcare solutions run by Aarhus Municipality in Denmark. Here, citizens can try out and get advice to help them choose the right technologies and aids and also VR solutions, pages 2 and 3.

Finally, this newsletter provides information on upcoming conferences and ISVR news. Do not miss the upcoming ISVR sponsored 13th International Conference on Disability, Virtual Reality & Associated Technologies, to be held in Serpa, Portugal in September 9-11, 2020.

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.

Sergi Bermúdez i Badia, ISVR president

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UPCOMING EVENTS

European Stroke Organisation and World Stroke Organization Conference (ESO-WSO 2020)
May 12–15, 2020
Vienna, Austria
https://eso-wso-conference.org

Rehabilitation World Congress
September 8-10, 2020
Aarhus, Denmark
https://www.riworldcongress2020.com/

13th International Conference on Disability, Virtual Reality & Associated Technologies
September 9-11, 2020
Serpa, Portugal
http://icdvrat2020.ulusofona.pt/

11th World Congress for Neurorehabilitation
October 7–10, 2020
Lyon, France
https://www.wcnr-congress.org/

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DokkX - Aarhus Municipalities innovative development center for welfare technologies and digital healthcare solutions

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Visitors at DokkX can experience and gain knowledge about the various VR systems and applications which are exhibited.

Where is your exhibition and development center located?

DokkX is Aarhus Municipalities innovative development center for welfare technologies and digital healthcare solutions. DokkX are located at Dokk1, a public citizen service center in Aarhus. DokkX brings together different groups and individuals to form an innovative environment combining user feedback with product development. These groups include companies, startups, health care providers and citizens.

What patient populations do you serve? How many per year?

DokkX serves citizens, educational and research organizations, municipality employees and companies. Besides being open for the public 4 days a week, the DokkX team also arranges and hosts several other activities. Our goal is to provide experiences with and spread knowledge about new welfare technologies and solutions.

The purpose of DokkX is to:

- Demystify, make visible and normalize welfare technology
- Inspire developers, engineers, students, designers and architects to develop new welfare technology
- Give citizens advice and guidance so that they can acquire the right technologies and aids
- Inform decision makers, employees and students within healthcare about the latest knowledge

Each month we receive approximately 1.100 visitors and run three different exhibitions each year.

(continued from page 2)

What VR rehab systems do you have installed?

At DokkX, we have several different VR solutions which are available for care and rehabilitation purposes:

- Khora Care (Samsung Gear)
- VR Snoezelen (Google Daydream)
- VR-Rehab (HTC VIVE)
- Gonio VR (HTC VIVE)

Besides these, we also display other VR-experiences and games, which are not created for rehabilitation purposes.

Every visitor can try the solutions within the exhibition and the staff can explain their purpose and practical use.

What benefits do you gain from using these VR rehab systems?

We experience a growing interest in VR and its use within healthcare and rehabilitation. Many of our visitors come to learn more about VR and experience it themselves. Most of the healthcare professionals and rehabilitation specialists who try VR are positive and agree that VR holds a large potential for creating meaningful and motivating rehabilitation exercises. Many health professions appreciate the opportunities for tracking their patients' progress and creating environments and challenges, which fit the individual patient. Based on experience with the previously mentioned systems, we can also see that VR, as a tool, can be used in various rehabilitation settings and not just within physical rehabilitation. These include rehabilitation of anxiety disorders and cognitive abilities.

VR-Rehab has several immersive environments in which the rehabilitation of activities of daily living can be performed.

What problems did/do you have with using VR rehab systems? If, so please describe briefly.

Although we experience huge interest from healthcare professionals, VR is still not widely implemented in the Danish rehabilitation practice. Through dialog with health care professionals in the exhibition, we have noted several factors which until now have limited the implementation of VR.

1. VR rehabilitation systems differ a lot from standard rehabilitation technologies. Consequently, clinicians need to alter their approach and adopt VR into their rehabilitation setting.
2. There are still few fully developed solutions for VR rehabilitation. Therefore, the use of these solutions still comprises limitations regarding usability.
3. Many VR systems need to be more intuitive to ensure more therapists can use it without prior specialized education.

ICVR 2019 SUMMARY

Welcome ICVR 2019

Workshop cognitive VR - Naomi Josman and Evelyne Klinger

Workshop mental Imagery - Eric Franklin and Amit Abraham

The 14th International Conference on Virtual Rehabilitation (ICVR 2019) took place at Tel Aviv University (Tel Aviv, Israel) from July 21-24, 2019 and was co-chaired by Rachel Kizony and Debbie Rand. Four workshops were held on the first day followed by three days of 3 keynote talks, 31 platform presentations, 43 posters, a demo session, a mentoring breakfast, a debate and a special panel on industry applications. A total of 200 participants from 15 countries attending one or more workshops and conference days made this a truly international event.

The conference program was crafted under the guidance of the four program chairs, Geoff Wright, Sandeep Subramanian, Gerry Fluet and Maayan Agmon. The workshops were organized by Evelyne Klinger, Judy Deutsch and Noa Givon. Financial support was provided by Tel Aviv University, the University of Haifa and the Israel Ministry of Science and Technology.

The awards process was organized by Alma Merians and Wendy Powell. Awards for Best Paper and Best Poster were sponsored by Bright Cloud International. The recipients of the Best Paper award were G. Burdea, K. Polistico, N. Kim, A. Kadaru, D. Roll, N. Grampurohit, A.M. Barrett, M. Oh-Park, J. Masmela, E. Kaplan P. Nori and S. Pollack "Novel Therapeutic Game Controller for Telerehabilitation of Spastic Hands: Two Case Studies".

International Conference Series on Virtual Rehabilitation

Presents the

ICVR Outstanding Service Award

to

Prof. Patrice (Tamar) Weiss

Founding Steering Committee Member of the
International Conference on Virtual Rehabilitation

In recognition of

Exceptional Leadership, Research Innovation and Dedication to Service

Presented at ICVR 2019, June 2019, Tel-Aviv, Israel

Tamar Weiss received the award for outstanding services. On her left, Debbie Rand, on her right Rachel Kizony, the ICVR 2019 Conference Chairs

ICVR 2019 SUMMARY

The recipients of the Best Poster award were A. Lamontagne, A. Blanchette, K. Andréanne K., J. Fung, B. McFadyen, S. Sangani, N. Robitaille, A. Deblock-Bellamy, M.A. Bühler, C. Perez, Claire and A. Menon "Development of a virtual reality toolkit to enhance community walking after stroke"

Best Student Paper, Best Student Poster, Best Young Paper and the Early Career Award were sponsored by the International Society for Virtual Rehabilitation. The recipients of the Best Student Paper award were O. Ben Gal, G.M. Doniger, M. Cohen Y. Bahat M. Plotnik, M. Schnaider Beeri and G. Zeilig "Cognitive-motor interaction during virtual reality trail making".

The recipients of the Best Student Poster award were Le Yu, Liu, S. Samir, Sangani, K. Patterson, J. Fung and A. Lamontagne "Effects of real-time visual feedback in the form of a virtual avatar on symmetry and other parameters of gait post stroke". The recipients of the Best Post-doctoral award were S. Maidenbaum A. Patel, E. Stein and J. Jacobs "Spatial Memory Rehabilitation in Virtual Reality – Extending findings from Epilepsy Patients to the General Population".

An award for Best Demo was sponsored by the ALYN Hospital ALYNnovation Space. It was given to Nikita Kovalenko for his demo an "Immersive Virtual Memory Task".

D. Levac was awarded the Early Career award by the International Society for Virtual Rehabilitation and PL (Tamar) Weiss was awarded a Special Recognition Award for Service and Leadership by the ICVR Steering Committee.

Finally, we are happy to announce that two special issues of selected

Workshop touchscreen devices - Alexandra Daniel Saad, Orit Greenstein and Noa Givon Shaham

Sergi Bermudez i Badia presents cognitive training

conference papers will be published in the Journal of NeuroEngineering and Rehabilitation and Disability (coedited by Geoff Wright, Sergi Bermudez and Meir Plotnik and Rehabilitation: Assistive Technology (coedited by Danielle Levac and Patrice (Tamar) Weiss.

Patrice (Tamar) Weiss

ICVR 2019 REVIEW

ICVR 2019 was held at Tel Aviv University in July of 2019. This was the 8th ISVR Conference and 5th ICVR that I have attended and participated in. Over the years, these conferences have afforded me opportunities to form valuable professional relationships, to be challenged and encouraged by my colleagues and to gather information and ideas that my team and I have implemented in our own work. ICVR 2019 provided a similar range of opportunities but I found two aspects of the conference to be particularly **encouraging**.

The first aspect was the three poster sessions. ICVR 2019 featured 43 posters. They explored rehabilitation options for no fewer than 15 distinct clinical populations.

The authors represented over 47 different heath care and academic institutions. At least twenty of the posters presented technology that would be considered low-cost. At my first ISVR conference in 2011, I was **inspired** by the brilliant work being done in a handful of labs using prohibitively expensive equipment to treat a handful of conditions. It was encouraging to see that in nine short years, our field has expanded and become more accessible.

The second aspect was Dr. Anat Mirelman's Key Note address. While it was encouraging to see a scientist that was trained by members of our society describe the largest study of virtual rehabilitation done to date, I was even more encouraged by her discussion of neural adaptations to virtual rehabilitation. As a Physical Therapist that has designed and performed tens of thousands of traditionally presented rehabilitation treatments and a scientist that has helped design and conduct thousands of virtual rehabilitation interventions I am intuitively aware that these stimuli are different. Dr. Mirelman's work and the work of others that she cited in her talk begin to shine light on the fundamental differences between virtual and traditionally presented rehabilitation. In my opinion, developing an understanding of these differences and leveraging them will allow the field of virtual rehabilitation to continue to grow in relevance and scope.

Gerard Fluet

REHABWEEK 2019 SUMMARY

Although the International Society for Virtual Rehabilitation and the International Conference for Virtual Rehabilitation did not take part as a participating conference in RehabWeek 2019, we did present a workshop and scientific panel. The workshop: "Application of current findings from virtual reality research to clinical intervention" was attended by about 30 conference registrants who ranged from researchers to graduate students, clinicians and several technology developers. The workshop goals were to review the strengths and weaknesses of the current treatment approaches with a focus on how the experimental results in virtual reality studies may be used to (1) modify current clinical interventions, (2) support new clinical approaches and (3) support the use of virtual reality as a clinical or diagnostic tool. Phillippe Archambault, Emily Keshner and Tamar Weiss presented overviews of VR technology as it relates to rehabilitation with a specific focus on VR applications for

wheelchair mobility to address how they can support assessment and training of wheelchair driving skills, psychophysical aspect of VR and its application to rehabilitation and personalization of motion capture-based virtual gaming platforms to address issues related to motor and cognitive intervention for children with disabilities. We had several "hands-on" demo sessions and concluded with a discussion on how to integrate VR in clinical settings: How to choose? How to use? Mindy Levin had been scheduled to participate but was unable to attend for personal reasons.

The panel session consisted of 4 scientific presentations attended by about 100 people. Tamar Weiss and Emily Keshner presented a talk on "Defining Virtual Reality Based Rehabilitation as a Field of Study" where they explored the evolving science of virtual reality-based rehabilitation that has moved from a predominantly technology development focus, to one that

focuses on how technology can support rehabilitation principles and outcomes. Rachel Proffitt spoke about "Using Video Games and Virtual Reality for Stroke Rehabilitation" in which she discussed how to use both off-the-shelf and customized virtual reality and video game interventions for stroke rehabilitation. Marika Demers presented work by her and Mindy Levin on "Using Virtual Reality for Upper Limb Rehabilitation after a Stroke: A Clinician's Perspective" where they explored how virtual reality interventions for rehabilitation should be based on principles of motor learning and identified the facilitators, barriers and strategies to the implementation and sustainability of virtual reality interventions in clinical practice. Finally, Sergi Bermúdez i Badia presented a talk on the "Design and Validation of Ecologically Valid Cognitive-Motor Rehabilitation Systems" focusing on a framework for the creation of personalized cognitive

REHABWEEK 2019 SUMMARY

rehabilitation tasks based on a participatory design strategy that allows the generation of training tasks parameterized according to patients' needs in multiple cognitive domains.

There were a number of additional talks at other RehabWeek 2019 panels including a presentation by ISVR Board member Danielle Levac on "Virtual reality as a Russian doll: exploring the 'active ingredients' of motor learning and transfer in virtual environments" and a poster by ISVR member Rachel Proffitt on "Daily Activity Recognition and Assessment System for Stroke Rehabilitation". Rachel was awarded 6th place for her poster, submitted under the ACRM track. Thus applications of VR in rehabilitation were well represented at the conference. We anticipate a continued presence at future RehabWeek activities either as a fully participating conference or as organizers of special workshops and panels.

Reported by Patrice L. (Tamar) Weiss
ISVR Board Member
Chair, ICVR Steering Committee
July, 2019

ISVR Society News
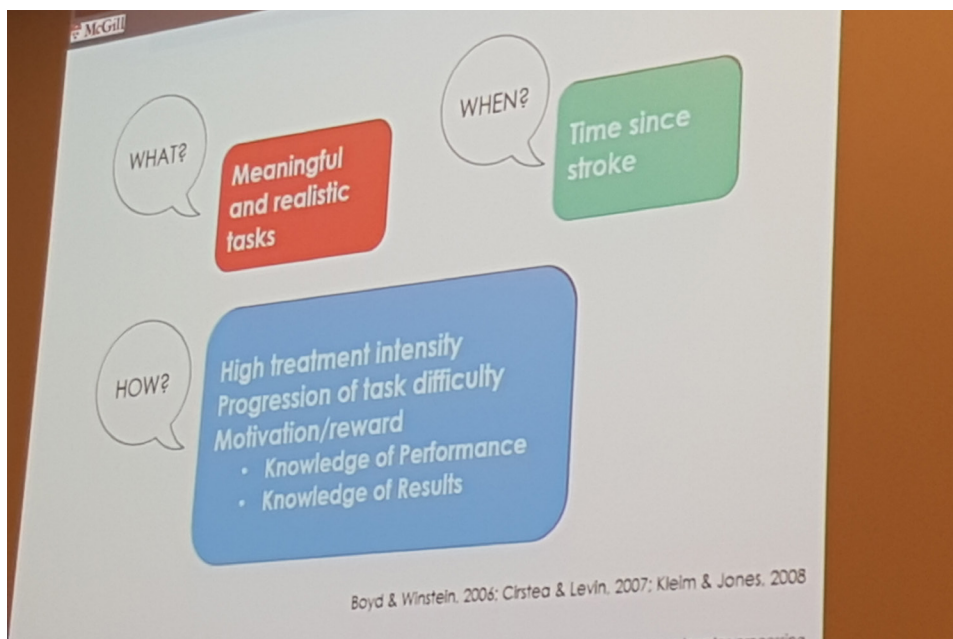
The website at http://www.isvr.org acts as a portal for information about the society. We are keen to to enhance the community aspects of the site as well as to to make it the first port of call for people wanting to know what is going on in the field of virtual rehabilitation and its associated technologies 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 1197 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.

Connect with us

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

13th International Conference on Disability, Virtual Reality & Associated Technologies
Serpa, Portugal ~ September 9-11, 2020

Call for abstracts opens in 3 months: January 6, 2020

We specifically welcome papers that contain original and mature research to address applications of Virtual Reality (VR) for therapy, and physical and cognitive rehabilitation; championing end user involvement in research, and which contain a rigorous evaluation of their approach. The guest editors encourage the submission of studies on Technologies for Rehabilitation including both physical and cognitive (e.g., Stroke), Healthcare Design and Applications, Visual Impairment, Elderly Studies/Dementia, Movement Disorders, Communication, Social Interaction, and Brain Injury. Research focused on wellness enhancement and treatment for persons with anxiety disorders, PTSD, depression, and addiction are also welcome. Augmented Reality, Affective Computing, Synthetic Agents, Privacy and Ethics, Brain Computer Interfaces, Rehabilitation Robotics, AI and Machine Learning, and Digital Game Making, are expected to be major upcoming themes when used to augment long standing VR approach and may be suitable topics for submitted papers but must be clearly located in the context of VR. Each paper should include a rigorous evaluation of the approach used.

Best papers will be submitted to Virtual Reality Journal (IF = 2.906) special issue:

https://www.springer.com/computer/image+processing/journal/10055

For more details, please check ICDVRAT 2020 website:

http://icdvrat2020.ulusofona.pt/

See you in Portugal in September 9-11, 2020!