

## Editorial

### May 2021 Newsletter 20

Dear reader

Welcome to the 20th issue of our society's newsletter. In this issue, we highlight two clinical virtual rehabilitation profiles located in Spain and Portugal, report on the results of the recent elections in the board of directors of ISVR and highlight recent books and upcoming conferences.

In Spain, we present the brain damage and movement disorders neurorehabilitation group at the Brain Damage Unit of the Beata Maria Hospital in Madrid. Their research focuses on balance and pain in Parkinson's disease. They also research non-invasive neuromodulation for the treatment of cognitive and motor sequelae of stroke, where also VR is integrated as an essential tool. Read more on pages 3 and 4. In Portugal, we present the Physical Medicine and Rehabilitation department part of SESARAM, the Regional Health System of the Madeira Islands which applies several VR treatments for patients with acquired brain injury. Their work is presented on page 2.

The election results for the ISVR board held in February are reported on page 7. I would like to use this opportunity to thank our outgoing directors, Dr Simon Horman, Dr Amir Tal and Dr. Roberto Llorens, for their continuous dedication in the last years and their important efforts, which have contributed so much to making ISVR the reference society in the Virtual Rehabilitation field. Also, I would like to warmly welcome Dr Martine Bordeleau and Dr Anjali Sivaramakrishnan, who just joined the board of directors with the Social Media and Website Chairs, respectively.

You will also find calls for papers and a book review in this issue, as well as the announcement of the 2021 International Society for Virtual Rehabilitation Early Career Investigator Award, the fifth edition of the award.

Also, you will find on page 11 an announcement of the 2021 International Conference on Virtual Rehabilitation (ICVR) meeting, which will take virtually place for the first time, and with a novel and very interactive format.

It is with deep sadness that we inform you on page 13 about the passing of the former Vice President of the ISVR, Christopher Aaron "Chris" Rabago, a very committed ISVR member and enthusiastic advocate of virtual rehabilitation.

Hopefully towards a brighter future, I hope all our readers stay healthy in these difficult times. 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](mailto:newsletter@isvr.org).

*Sergi Bermúdez i Badia, ISVR president*

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Editors:

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[newsletter@isvr.org](mailto:newsletter@isvr.org)

## UPCOMING EVENTS

### Final virtual conference VR4REHAB project

June 24, 2021

<https://vr4rehab.org/congress/>

### ICAT-EGVE conference

Physical-virtual hybrid conference

September 8-10, 2021

Sankt Augustin, Germany

<https://icat-egve-2021.org/>

### Rehabilitation World Congress

September 8-10, 2021

Aarhus, Denmark

<https://www.riworldcongress2021.com/>

### 13th International Conference on Disability,

Virtual Reality & Associated Technologies

September 8-10, 2021

Serpa, Portugal

<http://icdvrat2020.ulusofona.pt/>

### 9th International Conference on Sport

Sciences Research and Technology Support

October 28-29, 2021

Valletta, Malta

<http://www.icsports.org>

### European Congress of NeuroRehabilitation

December 8-11, 2021

Digital

<https://www.efnr-congress.org/>

## SESARAM

### Jean Claude Fernandes

Madeira Island Portugal

<https://www.sesaram.pt/portal/>

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Cognitive rehabilitation: Problem solving in a virtual city

**O**ur Physical Medicine and Rehabilitation department is part of SESARAM the Regional Health system of the Madeira Islands <https://www.sesaram.pt/portal/>. We have a close collaboration with the research group of the University of Madeira MITI (Madeira Interactive Technology Institute) in their development of virtual rehabilitation technology. Since 2019, the partnership between SESARAM and MITI allowed the development of a cognitive rehabilitation program using innovative technology that is validated, non-invasive and low cost. The program is part of a multidisciplinary personalised treatment of patients with sub-acute acquired brain injury. Currently, we have a maximum capacity of treating sixteen

patients per year and aim to expand this in the near future. The virtual reality component of our program includes rehab-city, rehab-task and rehab-task-generator. The theme behind rehab-city is a virtual city in which the patient goes to specific places (e.g.: supermarket, ATM, post office, amongst others) and is confronted with problems to solve (ex: in the supermarket, after choosing items from a list, receipts are shown of which he/she must choose the correct one). Rehab-task consists of cancellation tasks of symbols, figures, letters and numbers which train attention and visual memory. Rehab-task-generator is an online generator of pencil and paper cognitive tasks used for daily individual exercise plans at home. The VR systems aid in the systematic and graded training

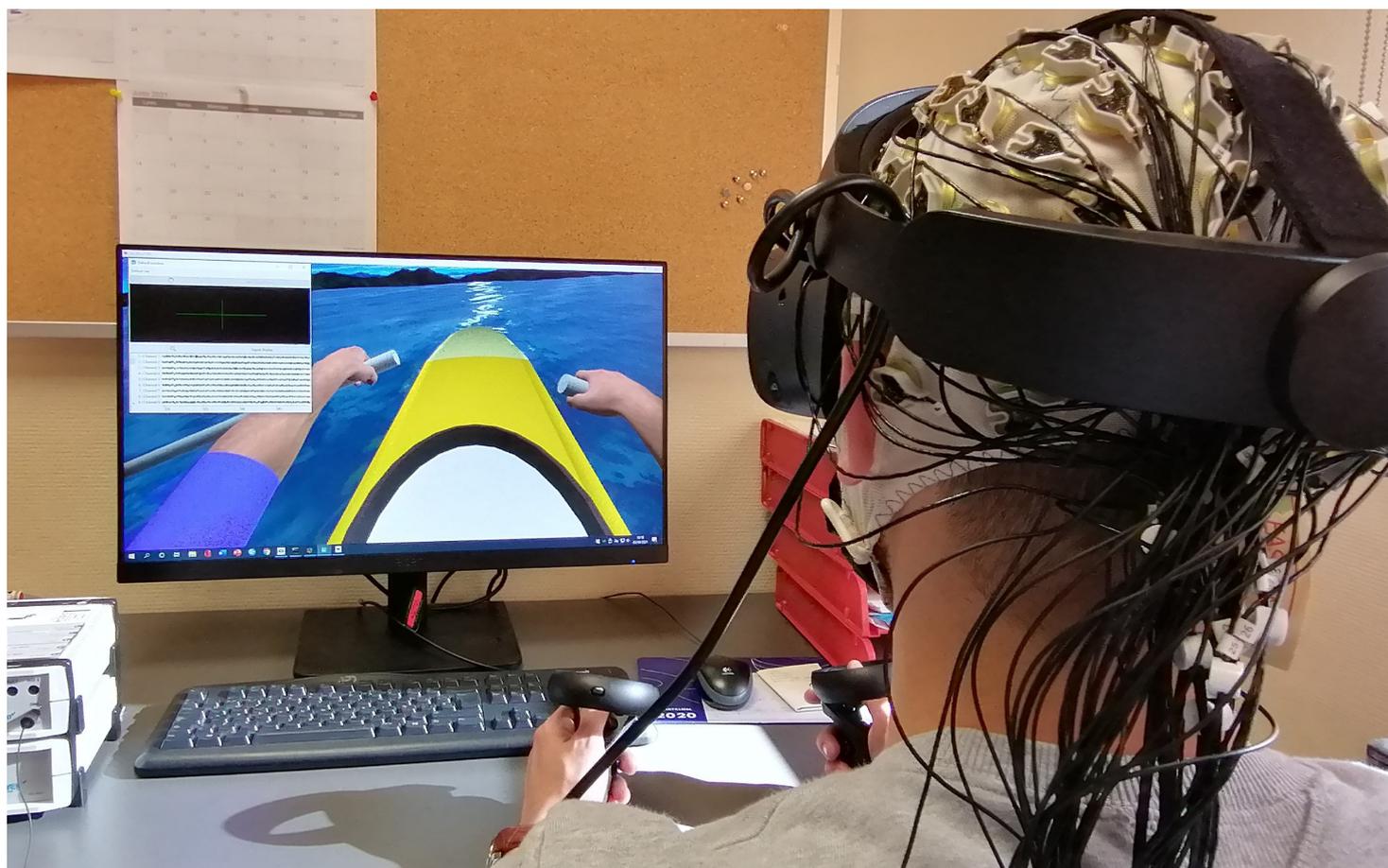
of different cognitive domains adjusted to the patient's capacity with the advantage of multi-sensorial feedback. Apart from occasional glitches the VR systems work well, although there is need to develop more domain specific cognitive games. We continue to collaborate with MITI, not only in the development of cognitive VR technology as well as the use of VR in motor recovery with the use of Brain Computer Interfaces (BCI), treatment of phantom pain for amputee patients and technology in aid of speech therapy. The progress we have had would not be possible if it wasn't for the combined effort of research and clinical personal finding innovative ways to solve problems and improve patient care.

## GINDAT

**Juan Pablo Romero Muñoz**

Madrid, Spain

<https://www.ufv.es/institute-of-life-sciences/brain-damage-neurorehabilitation-research-group/>  
[p.romero.prof@ufv.es](mailto:p.romero.prof@ufv.es)



Collection of electroencephalographic data during the training session

### **Could you tell us something about your group, who are you, where are you located?**

The brain injury and movement disorders neurorehabilitation group is based in Madrid at the Brain Damage Unit of the Beata Maria Hospital.

It is a multidisciplinary research group integrated by engineers, physiotherapists, neuropsychologists, and neurologists that collaborate to generate translational clinical research projects applied to the rehabilitation of cognitive and motor symptoms of movement disorders and brain injury. The group was born in 2014 from the

cooperation among the Experimental Sciences faculty of the Francisco de Vitoria University with the Neural and Cognitive Engineering group from the Spanish Superior Council of Scientific Research (GNEC) for a Spanish government-funded project called NeuroMOD where virtual reality + electroencephalography guided neurofeedback was tested as a neuromodulation therapy for motor symptoms in Parkinson's Disease (PD) with promising results.

The group is still young but is rapidly growing, it is led by Juan Pablo Romero, a neurologist who specialized in brain damage and movement disorders and currently combines his clinical practice

at the Brain Damage Unit of the Beata María Ana Hospital with his academic work at the Francisco de Vitoria University.

The group is integrated by four full-time researchers, two physiotherapists (Francisco Sánchez and Yeray Gonzalez) one Neuropsychologist (Aida Arroyo), and one Physics and Data Science Specialist (Ana María Maitín). Three part-time researchers (Begoña Rodríguez and David de Noreña, both neuropsychologists; Mercedes Barrachina who is a telecommunications engineer) also collaborate actively with the group.

# RESEARCH GROUP

(continued from page 3)

## What research interests does your lab have?

Currently, the group has two main research lines. On one hand, the research of technologic solutions for non-motor symptoms of Parkinson's Disease, such as balance impairments and pain. The second one is the use of non-invasive neuromodulation for the treatment of cognitive and motor sequelae of stroke.

There is a great amount of evidence to support the use of Virtual reality as a rehabilitation tool for its neuromodulation potential effects. This is one of the main reasons our group is integrating virtual reality as a key feature in our neurorehabilitation protocols.

In the Handboost project (NCT04815486 at trials.gov), we use the "neurow system" (NeuroRehabLab, Lisbon, Portugal) that combines EEG- NFB

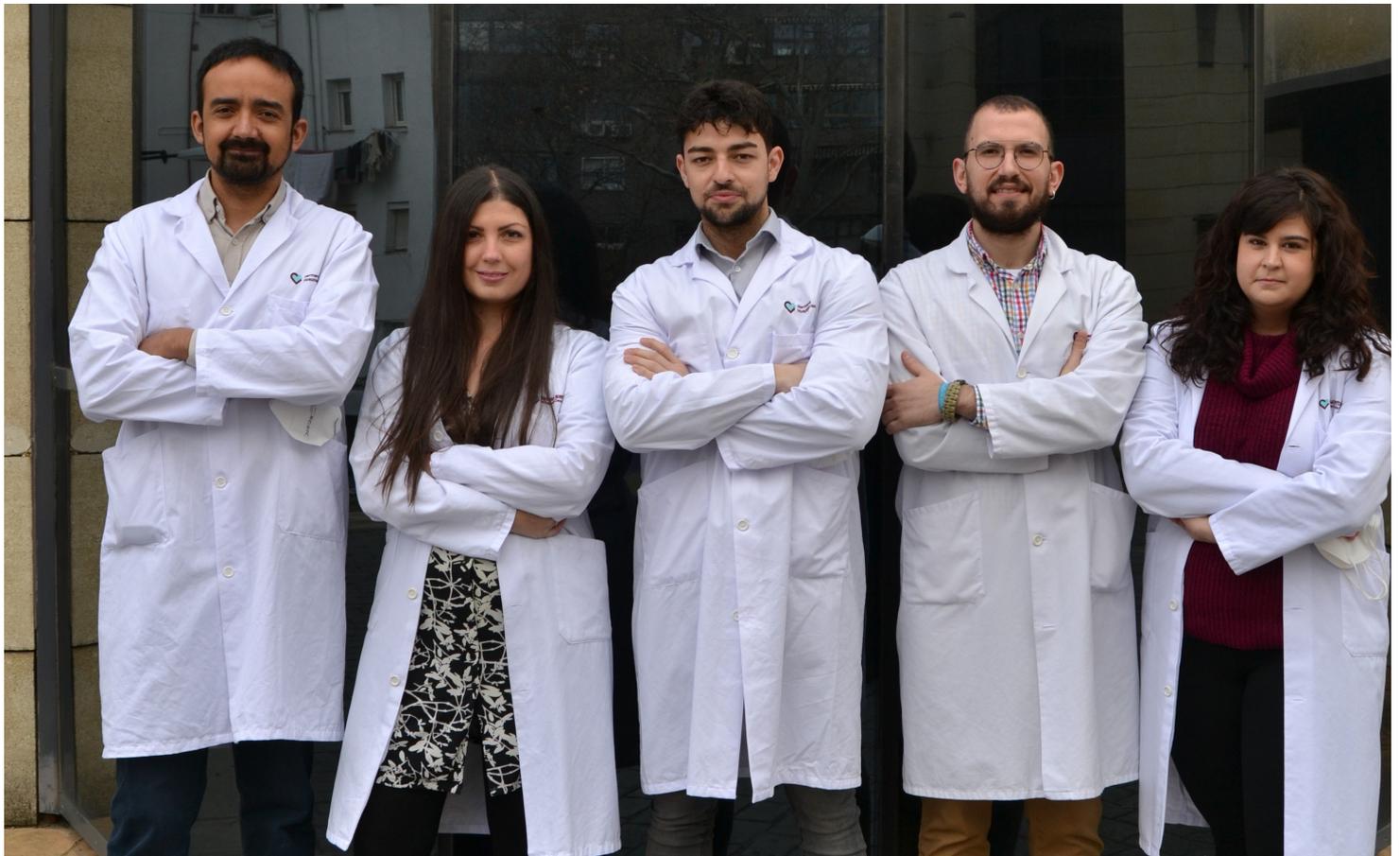
with virtual reality motor imagery to rehabilitate motor sequelae of stroke coupled with repetitive magnetic stimulation. This type of research is complementary to previous protocols developed by our collaborators at Madeira University and Institute for Systems and Robotics at Lisbon and has the objective to test the combination of two neuromodulation techniques to enhance upper limb rehabilitation.

We have previously used virtual reality for motor rehabilitation in Parkinson's Disease coupled to motor repetitive transcranial magnetic stimulation with good results and now we are using it for pain treatment. Pain is a highly prevalent and impairing non-motor symptom that is reported by Parkinson's Patients and has increased with COVID-19 related mobility restrictions that reduce the physical activity and social contacts of affected patients. There is no effective pharmacological or non-pharmacological approach

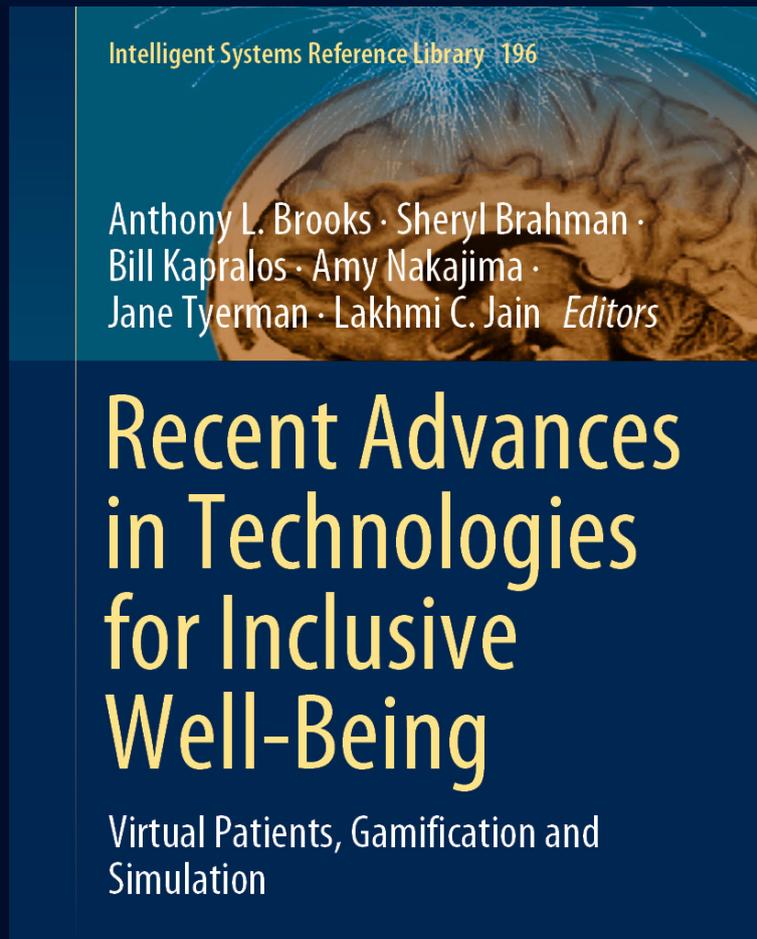
for this symptom as its response to conventional analgesics or levodopa seems to be incomplete.

To treat this symptom, we have started the PainPD-Imagine project protocol (NCT04651478 at trials.gov and published in <https://bit.ly/3bQXDey>), we hypothesize that using motor imagery and virtual reality we can influence the brain connectivity related to pain modulation. The advance this represents is that a non-pharmacological approach may be used with a low-cost and potentially accessible technology.

We are currently recruiting patients for HandBoost and PainPD-Imagine projects in our lab in Madrid, we expect to have the first results by the end of 2021. These new approaches may reinforce the use of virtual reality as a feasible and accessible complementary therapy for diverse neurological pathologies widening its potential applications.



GINDAT is the acronym for the Brain Injury and Movement Disorders Research Group at the Francisco de Vitoria University



### Recent Advances in Technologies for Inclusive Well-Being Virtual Patients, Gamification and Simulation Series

3rd volume in Springer series Technologies for Inclusive Well-Being

A.L. Brooks, S. Brahman, B. Kapralos, A. Nakajima, J. Tyerman, L.C. Jain (Eds.)

Intelligent Systems Reference Library Dedicated to the application of gamification, serious gaming, virtual simulation, and virtual patients to medical education and training and patient education. Provides insight regarding the ever-increasing role that gamification, gaming, and immersive technologies are playing in supporting a variety of medical based applications. Examines best practices, limitations, and advantages/disadvantages, as they relate to the application of gamification, game-based technologies, and immersive technologies to health professions education and training and patient education applications. In a time of ongoing pandemic when well-being is a priority, this volume presents latest works across disciplines associated to Virtual Patients, Gamification and Simulation. Chapters herein present international perspectives with authors from around the globe contributing to this impactful third edition to the series following a 2014 Springer book on Technologies for Inclusive Well-Being and a 2017 Springer book Recent Advances in Technologies for Inclusive Well-Being. Digital technologies are pervasive in life and the contributions herein focus on specific attributes and situations, especially in training and treatment programmes spanning across ranges of diagnosis, conditions, ages, and targeted impacts. This volume purposefully does not cover all (even if that was possible) aspects on how virtual interactive space can align to stial computing, which in turn can align with related embodied entities (whatever the terms used e.g. Virtual, Augmented, Extended, Mixed Realities) along with AI, Deep Learning etc



The website at <http://www.isvr.org> acts as a portal for information about the society. We are keen to enhance the community aspects of the site as well as 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](mailto: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](mailto:newsletter@isvr.org).



Connect with us



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

## Report of the ISVR 2021 Election Process

The election process was open from February 8<sup>th</sup>, 2021 to February 19, 2021 (23:59:00 US Western Daylight Time). There were two candidates for TWO available positions as members of the Board of Directors. There was one candidate available for the position of President and one candidate available for the position of Vice-President. The vote was held electronically, with a turnout of 44.68% of the membership, and the voting process was overseen by the following:

### Election Committee:

- Dr Mohammad Al-Amri (Chair)
- Dr Evelyne Klinger (ISVR Board member)
- Professor Emily Keshner (ISVR member)
- Mr Shayan Bahadori (Independent member)

### Election Officer

Dr Mohammad Al-Amri (Chair)  
Dr Evelyne Klinger (ISVR Board member)

### Results

- Sergi Bermudez i Badia endorsed as President, with a 100% approval.
- Philippe Archambault endorsed as Vice-President, with a 95.24% approval.
- Anjali Sivaramakrishnan endorsed as Website Chair and membership of the Board of Directors, with 90.48 % approval.
- Martine Bordeleau endorsed as Social Media Chair and membership of the Board of Directors, with 85.71% approval.

### Terms

- Term of Office for Sergi Bermudez i Badia is from Jan, 1<sup>st</sup> 2021 to Dec, 31<sup>st</sup> 2023, with an additional automatic term as Member of the Board (outgoing President) from Jan, 1<sup>st</sup> 2024 to Dec, 31<sup>st</sup> 2026.
- Term of Office for Philippe Archambault is from 1<sup>st</sup> 2021 to Dec, 31<sup>st</sup> 2023, with, subject to electoral approval, an expected term as President from Jan, 1<sup>st</sup> 2024 to Dec, 31<sup>st</sup> 2026.
- Term of Office for new Members of the Board is from 1<sup>st</sup> 2021 to Dec, 31<sup>st</sup> 2023, with, subject to Board approval, an extension from Jan, 1<sup>st</sup> 2024 to Dec, 31<sup>st</sup> 2026.

Mohammad Al-Amri  
Chair, ISVR Nominations and Elections Committee



CALL FOR NOMINATION

# ISVR Early Career Investigator Award 2021

Deadline: June 7, 2021

## ISVR Early Career Investigator Award 2021

### Call for Nominations – Deadline: June 7, 2021

We are pleased to announce the Fifth ISVR Early Career Investigator Award. The purpose of this award is to recognize and acknowledge outstanding contributions by early career scientists whose research relates to virtual rehabilitation. The recipient will be awarded a certificate and \$250. In addition, the awardee may be asked to present their research during one of our future virtual events. A runner-up will also be awarded a certificate.

### Eligibility criteria

- Have completed doctoral level studies up to 8 years prior to nomination.
- Have not previously received an ISVR Early Career Investigator Award

### Evaluation criteria

- Number and quality of publications
- Type and amount of research community service (committees, panels, reviewing, etc.)
- Type and amount of public outreach activities, including knowledge translation activities
- Evidence of clinical impact: teaching, standards setting, technology transfer
- Relevance of research to applications of virtual reality for rehabilitation

Individuals may be nominated by an ISVR member or be self-nominated.

A full application must include the following:

- Short biography (maximum 500 words)
- Full CV
- Description of key research innovation and impact on the field of virtual rehabilitation (maximum 2 pages)

**Application materials must be emailed to [awards@isvr.org](mailto:awards@isvr.org), before the deadline of June 7, 2021**

All procedures related to the award will be handled by the Chairs of the ISVR Awards Committee who will set the deadlines for nominations and selection mechanism.

# CALL FOR PAPERS



## ICAT-EGVE 2021

8.-10. September, Sankt Augustin, Germany

## ICAT-EGVE 2021

<https://icat-egve-2021.org/index.php/submission/call-for-paper/> <<https://icat-egve-2021.org/index.php/submission/call-for-paper/>>

The ICAT-EGVE 2021 conference is planned to be held September 8-10 in Sankt Augustin, Germany, as a physical-virtual hybrid conference, enabling both in-person and virtual participation. A final decision on the format will be taken June 2021. This is the merger of the 31th International Conference on Artificial Reality and Telexistence (ICAT 2021) and the 26th Eurographics Symposium on Virtual Environments (EGVE 2021). Together, these are two of the oldest international conferences in the world on Artificial Reality and Virtual Environments.

The conference will be co-located with the 18th workshop on VR/AR organized by the working group of the German Informatics Society.

We invite the submission of Papers, Posters and Demonstrations describing novel research ideas, work in progress, recently completed work, preliminary results, or unusual systems and applications. ICAT-EGVE 2021 seeks inspiring submissions describing research, applications or systems in all areas of Virtual Reality, Augmented Reality, Mixed Reality, Telexistence, and 3D User Interfaces, e.g., the following non-exhaustive list of more specific areas:

- \* 3D interaction for VR/AR/MR
- \* VR/AR/MR systems and toolkits
- \* User studies and evaluation for VR/AR/MR
- \* Telexistence, Telepresence and Teleimmersion
- \* Haptics, audio, and other non-visual modalities
- \* Serious games and edutainment using VR/AR/MR
- \* Presence, cognition, and embodiment in VR/AR/MR
- \* Novel devices (both input and output) for VR/AR/MR, and haptics
- \* Multi-user and distributed VR/AR/MR, Teleimmersion and Telepresence
- \* Immersive projection technologies and other advanced display technologies

Submissions in other related areas are welcome too.



VR 4 REHAB  
CONGRESS

VR4REHAB CONFERENCE

FROM  
IDEAS  
TO  
REALITY

CALL  
FOR  
ABSTRACTS

23 - 24  
JUNE  
2021

VIRTUAL CONFERENCE

Experience with us the spectacular closing of the VR4REHAB project, funded by Interreg North West Europe. An opportunity to discover the latest researches on virtual rehabilitation, share knowledge and form new collaborations, keynotes by experts of the XR area, companies showcase their latest products, and enjoy demonstrations of the VR4REHAB projects.

We invite everyone to submit abstracts from all aspects of virtual reality and rehabilitation.

ABSTRACT SUBMISSION DEADLINE 01 APRIL 2021, 23.59 CET

WWW.VR4REHAB.ORG

## VR4REHAB Congress – from ideas to Reality

It is estimated that 2.4 billion people had conditions that would benefit from rehabilitation services, yet there is a significant unmet need for rehabilitation across all the world regions. Rehabilitation, however, has not been prioritized in all the countries and is still under-resourced. Rehabilitation therapy is often seen as a fallback strategy when preventive, promotive, or curative interventions fail, and as a disability-specific service needed by only a few of the population.

VR4REHAB is an Open Innovation Network that believes in the power of virtual reality for rehabilitation. The goal of VR4REHAB is to break down these walls and to share knowledge, by making available to everyone a complete overview of Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (XR) applications for health and rehabilitation.

VR4REHAB is an Interreg NEW project in 2017 focused on developing VR and AR-based rehabilitation tools in co-creation with seven European partners. During the past four years, tons of ideas to improve rehabilitation through VR and AR-use have been developed during hackathons, game jams, and challenges, and six prototypes are ready to be launched. VR4REHAB has decided to conclude its journey with a Virtual Congress-from ideas to Reality, 23-24 June 2021. This conference is not only the spectacular closing of the project but also a new beginning. Overall, this conference will provide inputs to shape VR4REHAB messages for the future, opening a public discussion on future strategies, partnerships, and cooperation actions. We want to continue and expand the large co-creation network, which for now is between five countries, but most importantly we want to be able to create virtuous partnerships and provide support to all the actors who will join our network.

For this reason, in addition to the Call for Abstracts (Scientific abstract and Practice/Development abstract, deadline April 1st, 2021 (23.59 CET), it has been added to the VR4REHAB Congress, two Investor Lounges, in collaboration with EIT Health and Business Angels Connect. The investor lounges are available for digital health start-ups that need at least €500,000 in Series A funding, and start-up projects looking for early investment for innovative rehabilitation tools.

Participate in the Congress, come into contact with the best professionals, expand your network, and discover the latest VR/AR tools for the healthcare system. Share for future care.

Website: <https://vr4rehab.org/congress/>

# SAVE THE DATE

14-16 July 2021

13th International Conference on  
Virtual Rehabilitation

Symposia and Abstract

Submission Deadline Extended  
Monday, 26 April 2021



## International Conference on Virtual Rehabilitation 2021- <http://virtual-rehab.org/2021/>

Virtual Conference, July 14-16, 2021

### Short Presentation and Discussion Sessions

Short presentations will include brief, pre-recorded one-minute presentations given by individual authors. These presentations will be available to all conference attendees, during the entire meeting. These presentations will be followed by a virtual poster session. Each presenter will be assigned to a breakout room for ninety minutes. Attendees will enter and exit breakout rooms freely during the 90-minute session for live interactive poster session with the presenter.

### Symposia

Symposia sessions will include presentations by 3 to 5 individual speakers that offer unique perspectives on a specific central theme relevant to our community of researchers and clinicians, followed by a moderated, interactive scientific exchange involving the audience. The symposium session will not exceed 1 hour and 45 minutes to allow for sufficient time for the moderated discussion.

Symposia presentations will be chosen by the congress scientific committee with priority given to:

- topics that address novel or contentious issues
- bridge between basic and clinical fields
- include a diverse range of speakers that bring unique approaches or perspectives to the topic
- encourage in-depth discussion and debate between presenters and the audience

## 13th International Conference on Disability, Virtual Reality & Associated Technologies

# 13th International Conference on Disability, Virtual Reality & Associated Technologies

Serpa, Portugal ~ September 8-10, 2021

### Conference Theme

**Special Theme for 2021: Rehab Gamification.** As a special theme for ICDVRAT 2021, we encourage papers describing game-based solutions devised to rehabilitate motor and cognitive impairments. Papers accepted for the conference require the registration of at least one of the authors as a Full Delegate or Full Student Delegate to the conference.  
This year, ICDVRAT is run with Interactive Technologies and Games (ITAG) Conference.

### Conference topics

Virtual and Augmented Reality environments | Physical rehabilitation | Cognitive rehabilitation | Clinical assessment | Input devices | Remote/Telecare | Game Based Learning | VR for Health | Sensory impairment | Mobile health applications | Robotics and education | Rehabilitation robotics | Communications aids | Communication and language | Input devices | BCI | Machine learning | Affective computing | Synthetic Agents

### More information

<http://icdvrat2020.ulusofona.pt/>

# OBITUARY



## Dr. Christopher Aaron “Chris” Rabago

It is with heavy hearts that we announce the passing of Dr. Christopher Aaron “Chris” Rabago in March of this year. Chris was a former Vice President of ISVR and an enthusiastic participant in ICVR since 2015. Chris had a passion for learning, earning advanced degrees in Kinesiology, Physical Therapy and Biomedical Engineering. Chris enthusiastically served his country, in his position as Research Physical Therapist and Chief Scientist of the Military Performance Lab at the US Department of Defense’s, Center for the Intrepid (CFI). At CFI, Chris developed cutting edge treatments, many incorporating fully immersive virtual reality, for veterans and wounded warriors. Dr. Rabago’s research interests focused on gait, rehabilitation of persons with extremity trauma and lower extremity prosthetics. Dr. Rabago shared his expertise, training Physical Therapists through teaching positions at Baylor University and the University of Texas Health Center in San Antonio.