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Workshop on Intelligent Assistive Computing

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**Concept**

Assistive technologies have the goal to provide greater quality of life and independence in domestic environments by enhancing or changing the way people perform activities of daily living (ADLs), tailoring specific functionalities to the needs of the users. Significant advances have been made in intelligent adaptive technologies that adopt state-of-the-art learning systems applied to assistive and health-care-related domains. Prominent examples are fall detection systems that can detect domestic fall events through the use of wearable physiological sensors or non-invasive vision-based approaches, and body gait assessment for physical rehabilitation and the detection of abnormal body motion patterns, e.g., linked to age-related cognitive declines. In addition to an adequate sensor technology, such approaches require methods able to process rich streams of (often noisy) information with real-time performance. In this workshop, we aim at collecting novel methods, computational models, and experimental strategies for intelligent assistive systems such as body motion and behavior assessment, rehabilitation and assisted living technologies, multisensory frameworks, navigation assistance, affective computing, and more accessible human-computer interaction.

This workshop is scheduled to have a half-day format with invited talks from well-known researchers in the field of intelligent assistive computing and a call for contributed papers. Each speaker will give a 30-minute talk including 10 minutes to answer questions from the audience. We will be accepting abstracts and extended abstracts as contributions. The submitted abstracts will be reviewed by our confirmed program committee members. A number of selected papers will be presented during the workshop as posters and each author will have a 2-minute poster spot-talk. Three selected contributions will be invited to give a 10-minute oral presentation (including questions). Finally, a discussion session will be held at the end of the workshop with all the participants.

**Motivation**

Assistive technology has been the focus of research in the past decades. However, it flourished in the past years with the fast development of personal robots, smart homes, and embedded systems. The focus of this workshop is to gather neural network researchers, both with application and development focus, working on or being interested in building and deploying such systems. Despite the high impact and application potential of assistive systems for the society, there is still a significant gap between what is developed by researchers and the applicability of such solutions in real-world scenarios. This workshop will discuss how to alleviate this gap with help of the latest neural network research such as deep, self-organizing, generative and recurrent neural models for adaptable lifelong learning applications.

**Target Audience**

The expected audience to the workshop is mainly computer scientists working on areas related to intelligent learning with special interest in developing assistive applications in different domains. The workshop will bring together outstanding researchers along with graduate students to share the main latest contributions assistive intelligent computing. We hope to provide the opportunity to discuss fundamental current issues to be addressed in order to leverage current assistive applications as well as future research directions.

Based on the previous organization of and attendance to similar events and the specific topic, we expect to have an attendance of around 50 persons.

**Confirmed Invited Speakers**

Prof. Dr. Stefan Wermter, Universität Hamburg, Germany

Prof. Dr. Igor Farkas, Centre of Cognitive Science, Comenius University, Slovakia

Prof. Dr. Giulio Sandini, Italian Institute of Technology, Italy

**Workshop duration, format, activities, and schedule**

**Duration:** Half-day workshop

**Activities:** Invited talks, contribution spot talks, poster session, and discussion panel.

**Schedule**: A tentative program for this workshop is as follows:

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| Time | Activity |
| 09:00 - 09:15 | Welcome and introduction |
| 09:15 - 9:45 | Invited speaker 1 |
| 09:45 - 10:15 | Invited speaker 2 |
| 10:15 - 10:45 | Contribution talks |
| 10:45 - 11:00 | Poster spot talks |
| 11:00 - 11:30 | Poster Session and Coffee Break |
| 11:30 - 12:00 | Invited speaker 3 |
| 12:00 - 12:30 | Discussion panel and closure |

**List of committed program committee members**

The following researchers have confirmed their participation in the program committee:

Ahmadreza Ahmadi - Korea Advanced Institute of Science and Technology, South Korea

Amir Aly - Ritsumeikan University, Japan

Benjamin Rosman - University of the Witwatersrand, South Africa

Can Görür - TU Berlin, Germany

Christina Göpfert - Bielefeld University

Cristian Lopez - Universidad La Salle, Mexico

Claudio Henríquez - Universidad Central de Chile, Chile

Dennis Barrios - Universidad Catolica San Pablo, Peru

Emre Ugur - Bogazici University

Jimmy Baraglia - Vicarious, USA

Jorge Copete - Osaka University, Japan

Jose Part - Heriot-Watt University, UK

Josimar Chire - University of Sao Paulo, Brazil

Jungsik Hwang - Korea Advanced Institute of Science and Technology, South Korea

Junpei Zhong - National Institute of Advanced Industrial Science and Technology Tokyo, Japan

Leticia M. Seijas - Universidad Nacional de Mar del Plata, Argentina

Lorenzo Jamone - Instituto Superior Tecnico, Portugal

Marcelo Borghetti - University of Hamburg

María José Escobar - Universidad Técnica Federico Santa María, Chile

Nicolas Navarro-Guerrero - Aarhus University, Denmark

Paulo S. G. de Mattos Neto - Universidade Federal de Pernambuco, Brazil

Shingo Murata - Waseda University, Japan

Thiago Farias - Universidade de Pernambuco, Brazil

Victor Uc-Cetina - Universidad Autónoma de Yucatán, Mexico

Xavier Hinaut - Inria Bordeaux, France

**Organizers**

Dr. Pablo Barros received his bachelor's degree in information systems from the Universidade Federal Rural de Pernambuco, Brasil, in 2011. In 2013, he received his master's degree in computer engineering from the Universidade de Pernambuco, and in 2016 he received his Ph.D. degree in Computer Science from University of Hamburg. During his Ph.D he worked with affective robotics, with special interest on modeling intrinsic and extrinsic emotion behavior using deep and self-organizing neural networks. Currently he is a postdoctoral research associate in the DFG SFB Crossmodal Learning Project, at the University of Hamburg. He was also the main organizer of the Workshop on Computational Models on Crossmodal Learning during the 2017 ICDL-EPIROB conference in Lisbon, Portugal. Currently, he is a guest editor for a special issue on the journal IEEE Transactions on Cognitive and Developmental Systems. His current research interests include human-robot interaction, artificial neural networks, behavioral and computational aspects of affective robotics and crossmodal learning.

Dr. Francisco Cruz received the bachelor’s degree in engineering and the master’s degree in computer engineering from the University of Santiago, Chile, in 2004 and 2006, respectively. In 2015, he was a visiting researcher at the Emergent Robotics Laboratory in Osaka University, Japan. In 2017, he received the Ph.D. degree in Computer Sciences from the University of Hamburg, Germany, on the topic of developmental robotics with focus on interactive reinforcement learning. His thesis won the first prize in the Ph.D. contest during the 2017 LA-CCI conference. Dr. Cruz was the main organizer of the Workshop on on Bio-inspired Social Robot Learning in Home Scenarios during the 2016 IROS conference in Daejeon, Korea. Currently, he is a Guest Editor for a special issue in the journal IEEE Transactions on Cognitive and Developmental Systems. In 2017, he joined the Universidad Central de Chile as a Research and Teaching Associate. His current research interests include human-robot interaction, artificial neural networks, reinforcement learning, affordances, and psychological and bio-inspired models.

Dr. German I. Parisi received his Bachelor’s and Master’s Degree in computer science from the University of Milano-Bicocca, Italy, in 2010 and 2013 respectively. In 2017 he received his PhD in Computer Science from the University of Hamburg, Germany, where he was part of the international research training group on cross-modal interaction (CINACS). In 2015 he was a visiting researcher at the Cognitive Neuro-Robotics Lab at the Korea Advanced Institute of Science and Technology (KAIST). Since 2016 he is a research associate of the international project on crossmodal learning in the Knowledge Technology at the University of Hamburg. In 2017 He was co-organizer of the workshop on Computational Models for Crossmodal Learning during the ICDL-EPIROB conference in Lisbon, Portugal. He regularly serves as a reviewer for several international journals such as Neural Networks, IEEE Transactions on Cognitive and Developmental Systems, and Pattern Recognition Letters. His main research interests include neurocognitive systems for human-robot assistance, computational models of crossmodal learning, self-organizing and deep neural networks, and continual learning.

Dr. Bruno J. T. Fernandes has a bachelor's degree in computer science with an emphasis on software engineering and artificial intelligence by the Universidade Federal de Pernambuco (2007), and a master's (2009) and Ph.D degree (2013) in computer science, on the field of computer vision, by the Universidade Federal de Pernambuco, Brazil. He has experience in computer science with interests in computer vision and artificial intelligence. Currently, he is an Adjunct Professor at the Escola Politécnica at the Universidade de Pernambuco, where he is also the head of the research group on Pattern Recognition and Image Processing.