1 Half-day workshop on "Wearable Haptics"

Workshops and Tutorials will take place on Monday, June 22, 2015 during the IEEE World Conference 2015 in Chicago, USA.

General Information:
A web page will be soon available at http://tinyurl.com/ws-wearable-haptics-2015

2 ABSTRACT

The complexity of the world around us is creating a demand for novel interfaces that will simplify and enhance the way we interact with the environment. The recently developed operating systems devoted to wearable devices, like Android Wear, address this demand by providing a specific environment for all those companies that are now developing wearable devices, also known as "wearables". The wearable electronics business has powered over $14 billion in 2014, and it is estimated to power over $70 billion by 2024.

This market stems from the need for wearability, which is a key element for a natural interaction with nowadays technology. Development of wearbale haptics is crucial. Wearability haptics will enable novel forms of human intention recognition through haptic signals and novel forms of communication and cooperation between humans and robots. Specifically, wearable haptics will enable devices to communicate with humans during their interaction with the environment they share. Research challenges in this area are ambitious and cross traditional boundaries between robotics, mechanics, cognitive science and neuroscience. The applications cover robotics, health and social scenarios, stretching from human-robot interaction and cooperation for search and rescue, to human-human communication, and interaction with virtual worlds through interactive games

3 AUDIENCE

Topics include, but are not limited to, haptic sensing and rendering systems, wearable design issues, wearable haptic devices, tactile sensing and rendering systems.

The workshop is open to any student, researcher as well as developer and end user interested in designing/using wearable displays and its applications.

The goal is to encourage discussion between developers, to elaborate suitable tools and guidelines for the construction of more efficient wearable interfaces and to foster perceptual research of more advanced instruments for the investigation of the human behavior.

4 Program

- 1.30 – 1.35   Welcome by the organizers
- Talk 1 - Hong Tan (Microsoft Research and Purdue University) - Haptics and wearables devices in the consumer space
- Talk 2 -   Vincent Hayward (Pierre and Marie Curie University) - Turning neuroscience ideas into wearable haptic hardware

- Talk 3 - Domenico Prattichizzo (University of Siena and Istituto Italiano di Tecnologia) - Wearable haptics: design principles and applications
- Talk 4 - Miguel Otaduy (Universidad Rey Juan Carlos) - Skin and rendering models for tactile display

- *Panel discussion*
- *Coffee Break*

- Talk 5 - Matteo Bianchi, Gaetano Valenza, E. Battaglia, Pasquale Scilingo and Antonio Bicchi (University of Pisa and Istituto Italiano di Tecnologia) - Wearable haptics: sensing, perceptual and emotional aspects in human-robot applications
- Talk 6 - Nikos Tsagarakis, Ioannis Sarakoglou, Darwin Caldwell, (Istituto Italiano di Tecnologia) - Wearable device for proprioceptive feedback with intrinsic damping'
- Talk 7 - Antonio Frisoli (Scuola Superiore Sant'Anna) - Improving manipulation abilities with haptic feedback through wearable cutaneous devices
- (15 minutes) Panel Discussion and Concluding Remarks

5   ORGANIZERS

Prof.Antonio Frisoli, (Scuola Superiore Sant'Anna)

Antonio Frisoli (Eng., PhD) is Associate Professor of Mechanical Engineering at Scuola Superiore Sant'Anna, where he is the head of the Human-Robot Interaction area at PERCRO laboratory. He received his PhD (2002) with honors in Industrial and Information Engineering from Scuola Superiore Sant'Anna, Italy and the MSc (1998) in Mechanical Engineering, minor Robotics, from University of Pisa-Italy and in Industrial Engineering from Scuola Superiore Sant'Anna (1998). He has beenthe former chair of the IEEE Technical Committee on Haptics (2012-2014, awarded as the most active technical committee from IEEE RAS). Antonio Frisoli's research interests are in the field on design and control of wearable haptics and robots cooperating with humans, upper and lower limb exoskeletons for rehabilitation robotics and human motor control, virtual reality, advanced human computer interfaces for training, Brain Computer Interfaces. Currently he is studying new designs for exoskeletons systems, portable fingertip haptics and new brain-robot interfaces. He is author of more than 150 papers in peer-reviewed international conferences and scientific journals.

Prof. Domenico Prattichizzo, University of Siena and Italian Institute of Technology

Domenico received the M.S. degree in Electronics Engineering and the Ph.D. degree in Robotics and Automation from the University of Pisa in 1991 and 1995, respectively. He has been Associate Professor of Robotics at the University of Siena since 2002 and Scientific Consultant at Istituto Italiano di Tecnologia, Genova, Italy since 2009. In 1994, he was Visiting Scientist at the MIT AI Lab. He co-authored the Grasping chapter of Handbook of Robotics Springer, 2008, which was awarded two PROSE Awards by the American Association of Publishers. From 2003 to 2014, he has been Associate Editor in Chief of the IEEE Transactions on Haptics. From 2003 to 2007, he was Associate Editor of the IEEE Trans. on Robotics and IEEE Trans. on Control Systems Technologies. He was vice-chair for Special Issues of the IEEE Technical Committee on Haptics (2006-2010); chair of the Italian Chapter of the IEEE RAS (2006-2010), awarded with the IEEE 2009 Chapter of the Year Award; and co-editor of two books by STAR, Springer Tracks in Advanced Robotics, Springer (2003, 2005). His research interests are in haptics, grasping, visual servoing, mobile robotics and geometric control. He has authored more than 200 papers in these fields. Email: prattichizzo@diism.unisi.it.

Prof. Miguel Otaduy, Universidad Rey Juan Carlos – Madrid
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Miguel A. Otaduy is an associate professor (profesor titular interino) at Universidad Rey Juan Carlos (URJC Madrid), where he works at the Modeling and Virtual Reality Group (GMRV), in the Department of Computer Science.

He received his BS (2000) in Electrical Engineering from Mondragon Unibertsitatea (Spain), and his MS (2003) and PhD (2004) in Computer Science from the University of North Carolina at Chapel Hill. He completed his PhD thesis in the field of haptic rendering under the advisory of Prof. Ming Lin, and supported by fellowships from the Government of the Basque Country and the UNC Computer Science Alumni.chair of the IEEE RAS Technical Committee on Haptics. Email: kuchenbe@seas.upenn.edu.