

**Workshop IEEEVR 2019 Osaka**  
**March 25, 2019**  
**Neuroscience and Virtuality: NeuroVirt**

Organisers: Irini Giannopulu<sup>1</sup> & Tomoko Yonezawa<sup>2</sup>

<sup>1</sup>iCAM (Interdisciplinary Centre for the Artificial Mind), Faculty of Society and Design, Bond University, Australia

<sup>2</sup>Virtual Communication Media Design, Kansei University, Japan

Virtuality (or virtual reality) is associated with a representation, an abstraction of real/physical environment. It is a second presentation of the external world, a simulation of the real or imagined world. In virtuality, objects, scenes, actions do not physically exist; they are artificially built. As a computer based technology, it gives users the possibility to navigate and interact with and within a 3D virtual space. Virtuality shares elements with augmented reality, a variation of virtual environments that mixes virtual atmospheres with real scenes of the external world and brings this new world into a person's perception. Augmented reality immerses an individual inside a fabricated environment: both real and artificial. Virtual reality substitutes the real world with a simulated one, whereas mixed and augmented reality modify one's current perception of the external world including his/her own body representation. Virtual reality results from a visuo-vestibular and somesthetic conflict; mixed as well as augmented result from a visuo-vestibular and somesthetic interaction. Immersion is possible when humans have all the required conditions including sensory, behavioural, cognitive and neurophysiological. As virtuality, neuroscience is based on a simulation process, that is the creation of neural representations of the external world. Motion imagery, mental images, self-motion perception and spatial navigation which are based on neural processing share similar mechanisms with virtuality. In that context, neuroscience can contribute to the improvement of virtuality; virtuality can add to the understanding of brain functioning, development and plasticity. This requires scientific collaborations with the aim to analyse the core of knowledge utilising the results acquired not only in virtual/mixed/augmented reality but also to better discern the relationship between the brain and the mind. The aim of the workshop is to bring together neuroscientists, psychologists, engineers, computer scientists, artists and roboticists, to explore the relationship between neuroscience and virtuality. In this workshop we expect between 15 to 20 participants.

Submissions of papers or preliminary research results in the form of papers following IEEEVR 2019 formatting guidelines (<http://IEEEVR.org/2019>) are invited.

Topics include but are not limited to typical and/or atypical children, adults and elderly

- Brain and Immersion/Presence (virtual/mixed/augmented reality)
- Visuo-vestibular and proprioceptive interactions
- Mental images/emotion in VR
- Virtual/Robotic Installation
- Spatial navigation in real and virtual naturalistic environment

Please send your submissions to [igiannop@bond.edu.au](mailto:igiannop@bond.edu.au) by January 25, 2019. Notifications of acceptance will be given by February 05, 2019, Camera-ready February 19, 2019.