nanoSeminar Series 2022

Institute for Materials Science

Prof. Shu-Chen Li

Chair of Lifespan Developmental Neuroscience, Faculty of Psychology, Centre of Tactile Internet with Human-in-the-Loop, TU Dresden

Multisensory presentation across the lifespan: implications for Tactile Internet and Digital Sensing

Thursday, May 19th 2022
13:00 – 14:00

Normal: Seminar Room 115, Hallwachsstr. 3 (HAL)
Pandemic version: https://tinyurl.com/nanoSeminar-GA

Humans interact with the environments through their senses. Since Helmholtz's classical concept, it is well known in psychology and cognitive neuroscience that human perception and action are influenced by an individual's prior sensory and learning experiences, as well as by other factors, such as task-specific goals or contexts. Neuronal gain control of neural information processing and uncertainty reduction are key mechanisms of hu-man multisensory perception. Empirical data from lifespan developmental psychology and cognitive neuroscience show that the one-size-fits-all assumption, which is commonly adopted in the engineering fields, cannot by default be applied to user populations covering broad age ranges. Empirical evidence indicates that mechanisms of brain development and aging can substantially impact neuronal gain control with consequences for the speed and robustness of human perception and action. Furthermore, prominent age-related differences pertaining to the development and aging of the frontal-parietal brain network affect multiple cognitive functions, such as attention, executive control and valuation. These effects on cognition would further influence goal-directed multisensory perception and action across the lifespan. Thus, the Human-in-the-Loop approach for tactile internet and digital sensing requires systematic investigations of the effects of development, aging and skill acquisition on the dynamic interplay between multisensory perception, goal anticipation and action.

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Shu-Chen Li is a Professor and head of the Chair of Lifespan Developmental Neuroscience at TUD since 2012. She is a co-speaker of the DFG Cluster of Excellence CeTI (Centre for Tactile Internet with Human-in-the-Loop) since 2019. She received her Ph.D. degree in cognitive psychology from the University of Oklahoma in the USA in 1994. After working as a postdoc at the McGill University in Canada, she continued her research career at the Max Planck Institute for Human Development in Germany for 16 years until she took up the professorship at TUD. From 2006 to 2008, she was also an adjunct professor of the Brain Research Center in the College of Electrical and Computer Engineering at the National Chiao-Tung University in Taiwan. A key aspect of her research focuses on understanding brain mechanisms of neuronal gain control and their implications on age-related differences in perception and cognition across the human life span. For several years she served as the associated editor of Developmental Psychology, one of the flagship journals of the American Psychological Association. She is currently a member of the editorial board of Neuroscience and Biobehavioral Reviews.

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