Human cognition is the result of complex interactions between several cognitive processes such as memory, perception, decision making and so on. These functions have their own limitations. Augmented cognition research attempts to aid/expand these cognitive functions through an IT, machine learning and wearable device technologies. However, most of the augmented cognition technology is passive in nature. They provide information only when users explicitly ask for it and often, in the process of doing it, overburden users with unnecessary information. Obviously, this happens because they are machines with no mind. They do not know how to interact with humans. They do not understand what the user wants. This understanding of others’ need and intention require an inherent capacity, which every human being is born with, is called empathy. It is an ability to understand others’ intention, emotion etc. Theory of mind suggests that human beings have a capacity to understand each other’s intention through several explicit and implicit cues. By picking up these cues human beings learn to understand other’s intention and interact. Replicating this kind of empathy in a machine, so that it can understand what the user wants and provide necessary support, is a real challenge in artificial intelligence for future aging society.

In this talk, I will discuss about the development of an augmented cognition system, which actively attempts to understand users’ mind and provide necessary and intended information to support various cognitive functions. Our proposed system makes use of several implicit cues such as pupil dilation, eye movement, gestures, etc. In the course of my talk, I will show (1) how intention of users can be analyzed and identified and (2) how identified intention can be used to deliver intended support to users through augmented cognition devices.

Biographical information

Minho Lee received his Ph.D. From Korea Advanced Institute of Science and Technology (KAIST) in 1995 and is currently a Professor in the School of Electronics Engineering, Kyungpook National University, Daegu, Korea. He established the Mobile Technology Commercial Center at Daegu and worked for Education & Training Department as the director from 2005 to 2006. He was a visiting professor for Dept. of Brain and Cognitive Science at MIT from 2006 to 2007. He received several best paper awards at intentional conference including ICONIP (2007 and 2009), IDEAL (2008), ICAISC (2006) and ISABEL (2006), best award for industry collaboration at KNU (2014) and Excellent Service Award from APNNA (2014). He has worked with several international journals (including Neural Networks and Nature Intelligence) as an Associate Editor. He has also been Program chair and special session chair for various international conferences. Dr. Lee was president of the Asia-Pacific Neural Network Assembly (APNAA) and General Chair for the International Conference on Neural Information Processing (ICONIP) in 2013. He is the General Chair for International Conference on Human Agent Interaction (HAI) in 2015. His research interests include brain-neurinformatics, biologically-inspired vision systems, human augmented cognition, selective attention, brain-machine interaction and intelligent sensor systems.