Biography

Gowrishankar Ganesh received his Bachelor of Engineering (first-class, Hons.) degree from the Delhi College of Engineering, India, in 2002 and his Master of Engineering from the National University of Singapore in 2005, both in Mechanical Engineering. He received his Ph.D. in Bioengineering from Imperial College London, U.K. in 2010. From 2004 and through his PhD, he worked as a Researcher in Human Motor Control in the Lab of Dr. Mitsuo Kawato at the Advanced Telecommunication Research Institute (ATR), Japan. Following his PhD, he worked at the National Institute of Information and Communications Technology (NICT) in Japan as a Specialist Researcher in Motor Neuroscience and Robotics. In January 2014 he joined the Centre National de la Recherché Scientifique (CNRS-France) as a Senior (CR1) Researcher and is currently stationed at the CNRS-AIST joint robotics lab (JRL) in Tsukuba, Japan. He is a visiting researcher at the Centre for Information and Neural Networks (CINET) in Osaka, ATR in Kyoto and the Laboratoire d'Informatique, de Robotique et de Microélectronique de Montpellier (LIRMM) in Montpellier. His research interests include human sensori-motor control and learning, robot control, cognitive neuroscience and robot-human interactions.

Incorporation of tools in the body schema: a dual time scale process

Abstract:
It is generally accepted that the human dexterity with tools stems from our ability to incorporate and use tools as extensions of our body. However, regularly examined tool incorporation processes are gradual and result from extended tool-use. On the other hand we can immediately switch between tools, say from pointing on a board with the pointing stick to pointing with a much shorter pen without requiring any practice. This ability points to the presence of immediate tool incorporation processes. Here, utilizing two novel experiments, we elucidate the presence of additional immediate tool incorporation effects that determine motor planning with tools. Interestingly, tools were observed to immediately induce a trial-by-trial, tool length dependent shortening of the perceived limb lengths, opposite to observations after extended tool-use. Our results thus suggest that tools induce a dual-effect on our body representation; an immediate shortening that critically affects motor planning with a new tool, and the slow elongation probably representing the increase in skill of a repeatedly used tool.