Clavius Distinguished Lecture (CDL 2014)

and

The Department of Computer and Information Science

Present

Dr. Shinsuke Shimojo
Division of Biology and Computation & Neural Systems
California Institute of Technology
Pasadena, CA, USA

Title: Sensory substitution, multisensory plasticity, and the third kind of "qualia"
Date: March 27, Thursday, 2014
Time: 1:00-2:00pm
Location: Flom Auditorium, Walsh Library.
Reception: Will follow on the fourth floor, O'Hare Special Collections Room.

***This talk is of multidisciplinary nature. It is a comprehensive presentation for current and future scientists, artists, engineers, and social scientist.**
***For directions and information, please contact Ms. Palma Hutter at hutter@fordham.edu or 718-817-4480. Parking is available at the Rose Hill campus.**

ABSTRACT: "Qualia" to some refers to the absolute, unique quality of a conscious sensory experience, which may not be "explained away" by neurophysiology. Whereas we do not endorse the qualia as a "hard" (i.e. impossible in principle) problem for science, we still agree that the current sensory sciences fail to critically characterize such unique quality of sensory experiences. We aim to find insights in the latest progresses of sensory substitution. The "vOICe" is one of such devices translating visual into auditory inputs for blind people. There are some superusers who claim "visual" experiences. Moreover, some of them showed neural activity in the visual cortical areas in fMRI when engaged in a variety of tasks relying on this type of device. Our strategy is to come up with a brief list of psychophysical and neuroscientific criteria for "vision-like" processing and to search for empirical evidence, including (1) cortical mapping of space via the device, (2) accomplishment of perceptual constancy, and (3) intrinsic (synesthesia-like) crossmodal mapping. Another approach we take is to fully utilize intrinsic crossmodal mappings (correspondences) to make the training and perception via the device automatic and effortless. The results suggest that qualia, if still want to use such a word, should be understood with regard to adaptive behavior and automatic processing. Moreover, what such training/experience accomplishes should be characterized best as the third kind of qualia. Enrichment of sensory experiences due to intrinsic and associative mapping provides scientists, engineers and artists with ample opportunities.

CDL Speaker Bio: Shinsuke Shimojo received his Ph.D from MIT ('85), and is currently Gertrude Baltimore Professor of Experimental Psychology in the Division of Biology / Computation & Neural Systems, at the California Institute of Technology. The Shimojo Laboratory has been devoted to tackling the issue of how the human brain enables us to perceive objects and respond to them adaptively. Using visual illusions, adaptation and aftereffects, he and his colleagues have developed new psychophysical and cognitive neuroscientific techniques for enhancing our understanding of higher-order visual perception, spatial attention, integration across different sensory modalities, and sensory-motor functions. Shimojo also has authored or co-authored more than one hundred fifty publications in prestigious journals including Nature, Science, Nature Neuroscience, Neuron, and Proceedings of National Academy of Science, etc. The latest findings from his laboratory indicate importance of implicit cognitive and emotional processes in vision, multimodal perception, and decision making. Among his many awards, he received the Japanese Neuroscience Society Tokizane Memorial Award in 2004 for his discovery of new perceptual phenomena related to visual contours and surfaces and his investigation of the underlying neural mechanisms. He also received the Most Innovating Research Award from the Japanese Society of Cognitive Science in 2008 for his work on counter-intuitiveness of Bayesian inference. For his series of books for non-expert general readers, he received the Santory Prize for Publications in Humanity and Social Sciences. He has also been well known for other types of out-reaching activity, such as collaborations with artists in science museum exhibitions and writing regularly as a science columnist at Asahi digital RONZA.