

Invited Speaker Seminar

Title:

“Decoding conscious and unconscious mental states from brain activity in humans”

Speaker:

Professor John-Dylan Haynes

Bernstein Center for Computational Neuroscience Berlin and
Max-Planck-Institute for Human Cognitive and Brain Sciences, Leipzig

Host:

Dr Michael Chee

Principal Investigator, Cognitive Neuroscience Laboratory

DATE	VENUE	TIME
Tuesday, 01 July 08	Duke-NUS Graduate Medical School Singapore Block 1, Classroom 7	4.30pm to 5.30pm

Abstract:

Recent advances in human neuroimaging have shown that it is possible to accurately read out a person's conscious experience based only on non-invasive fMRI measurements of their brain activity. This "brain reading" is possible because each thought is associated with a unique pattern of brain activity that can serve as a "fingerprint" of this thought in the brain. By training a computer to recognize these fMRI "thought patterns" it is possible to read out what someone is currently thinking with high accuracy. Here several studies will be presented that also directly address the relationship between neural encoding of information (as measured with fMRI) and its availability for awareness. These studies include comparisons of neural and perceptual information, unconscious information processing, decoding of timecourses of perception, as well as decoding of high-level mental states. This will show that it is possible to read out a person's concealed intentions and even to predict how someone is going to decide a few seconds later. Finally, the talk will discuss fundamental challenges and limitations of the field, along with the ethical question if such methods might one day be a danger to our mental privacy.

2 selected papers

Soon, C.S., Brass, M., Heinze, H.-J. & Haynes, J.D. (2008). Unconscious determinants of free decisions in the human brain. *Nature Neuroscience* (in press, to appear May 2008).

Haynes, J.D. & Rees, G. (2006) Decoding mental states from brain activity in humans. *Nature Reviews Neuroscience* 7, 523-534.

Biography:

After completing his Diploma (MSc) in Psychology at Bremen University in 1997, Professor Haynes gained extensive research experience as postgraduate researcher at the Institute for Psychology and Cognition Research, University of Bremen (1997-2000); the Hanse-Institute for Advanced Studies, Delmenhorst, Germany (1999-2001); the Department of Neurology II at the Otto-von-Guericke University Magdeburg (1999-2003); and the Institute for Neuropsychology and Behavioural Neurology, Bremen University (2001). In 2003, he earned his PhD (Dr. rer. nat.) from the Faculty of Biology, University of Bremen, graduating with distinction ("summa cum laude"). Professor Haynes did his post-doctoral training at the Institute of Neuroscience, Plymouth (2001-2003); and the Institute for Cognitive Neuroscience and Wellcome Department of Imaging Neuroscience, University College London (visiting research fellow, 2001-2003; postdoc, 2003-2005). After establishing his own research group at the Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, in 2005, he also became Professor at the Bernstein Center for Computational Neuroscience Berlin in 2006, and to date holds both positions concurrently. His main research focus is using pattern recognition techniques to decode mental states from brain activity, with special emphasis on applying this method to address important questions related to the contents of conscious awareness.

All are welcome

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2 Jalan Bukit Merah Singapore 169547

General Enquiries : (65) 6516 7666 Fax : (65) 6224 6242 Email : info@gms.edu.sg Website : www.gms.edu.sg