The Royal Academy of Engineering

WSRI web science research initiative

A Philosophy of Engineering Seminar

AI and IT: Where Engineering and Philosophy Meet

11th July 2007

The Emmanuel Centre
Marsham Street
London SW1P 3DW

A Philosophy of Engineering Seminar

AI and IT: Where Engineering and Philosophy Meet

Programme

2pm:	Registration, Tea and Coffee
2.30pm:	Welcome address - **Professor Wendy Hall CBE FREng**
2.40pm:	**Professor Nigel Shadbolt FREng** *Philosophical Engineering*
3.25pm:	**Professor Igor Aleksander FREng** *The Engineering of Phenomenological Systems*
4.10pm:	Tea and Coffee
4.30pm:	**Dr Ron Chrisley** *Interactive Empiricism:* *The Philosopher in the Machine*
5.15 pm:	Panel Discussion Session
5.50pm:	Closing remarks by Chair
6.00pm:	Reception at The Royal Academy of Engineering, 29 Great Peter Street

To register for this event, contact
Miss Sylvia Hearn on sylvia.hearn@raeng.org.uk or on 020 7227 0519

For further information about this, or any of The Royal Academy of Engineering's Philosophy of Engineering seminars, contact Dr Natasha McCarthy on natasha.mccarthy@raeng.org.uk or on 020 7227 0575.

The full schedule of seminars is available at: www.raeng.org.uk/policy/philosophy/default.htm

This seminar, held in partnership with the Web Science Research Initiative will address questions of philosophical importance raised by modern engineering in Web sciences, AI and IT. The speakers will address the following questions: What can engineering tell us about consciousness? Who decides when we have built a conscious machine - the philosopher or the engineer? What can philosophers and engineers contribute together to the study of, and research into, AI? What issues does the Web, especially the Semantic Web, create for philosophy?

The Web Science Research Institute (WSRI) is a long-term research collaboration established by the Massachusetts Institute of Technology and the University of Southampton that aims to facilitate and produce the fundamental scientific advances necessary to guide the future design and use of the World Wide Web. The founding Directors are Sir Tim Berners-Lee FREng, Wendy Hall CBE FREng, Nigel Shadbolt FREng and Daniel Weitzner. WSRI provides a global forum for scientists and scholars from around the world to collaborate on the first multidisciplinary scientific research effort specifically designed to study the Web at all scales of size and complexity, and to develop a new discipline of Web science for future generations of researchers. WSRI will generate a research agenda for understanding the scientific, technical and social challenges underlying the growth of the Web.

Professor Igor Aleksander FREng is Emeritus Professor of Neural Systems Engineering at Imperial College, having been Head of Electrical and Electronic Engineering and Pro-Rector in the College. He is a visiting researcher at Sussex University. He has researched artificial intelligence and neural modelling since 1965 and is currently contributing to research and discussions on 'machine consciousness'. He has published 13 books and over 200 papers. In 2000 he was awarded a lifetime achievement medal by the IEE for his contributions to informatics.

The Engineering of Phenomenological Systems Some major critiques of AI over the last 50 years have been based on its inability to capture intentionality or the 'aboutness' of concepts in the world (Searle: The Chinese Room). Originally seen as a contribution by Franz Bertrano to phenomenology, intentionality or the lack thereof is part of an apparent inability in AI to capture concepts such as 'self', 'presence' and 'imagination' the way they are discussed by phenomenologists (e.g. Husserl, Merleau-Ponty etc.). I will review the willingness in the last decade or so for computer scientists to address this issue and illustrate this with some work done in my group. (See Aleksander: The World in my Mind, My Mind in the World: Key Mechanisms of Consciousness in Humans Animals and Machines. Exeter, Imprint Academic, 2005)

Dr Ron Chrisley is the Director of COGS, the Centre for Research in Cognitive Science at the University of Sussex, where he holds a Readership in Philosophy in the Department of Informatics. He has held various research positions in Artificial Intelligence, including a Leverhulme Research Fellowship at the University of Birmingham and a Fulbright Scholarship at the Helsinki University of Technology, as well as positions at NASA-Ames, Xerox PARC, the Stanford Knowledge Systems Laboratory and ATR Laboratories near Kyoto. For the past fifteen years he has also been an occasional visiting lecturer and researcher at the University of Skövde. He was awarded his doctorate by the University of Oxford in 1997, and is the editor of Artificial Intelligence: Critical Concepts (Routledge 2000).

Interactive Empiricism: The Philosopher in the Machine Although an understanding of the importance of engineering for philosophy can be traced back at least as far as Giambattista Vico's slogan "Verum Ipsum Factum" ("what is made is what is true"), the landmark elaboration of this understanding in the context of artificial intelligence (AI) is Aaron Sloman's The Computer Revolution in Philosophy. Using the key findings of that work as a foundation, I will argue that in the field of AI, the mutual benefits of philosophy and engineering extend well beyond the general salutary interdependence of theory and practice. Interactive empiricism will be introduced as the claim that key breakthroughs in both building and philosophically understanding consciousness will result from the theorist/philosopher being an integrated causal component of the system being designed. Recent work in AI will be used to support this claim.

Professor Nigel Shadbolt FREng is a Professor of Artificial Intelligence in the School of Electronics and Computer Science (ECS) at the University of Southampton. His research concentrates on two ends of the spectrum of AI - namely, Knowledge Technologies and Biorobotics.
In its 50th Anniversary year, Nigel is President of the British Computer Society. Between 2000 and 2007, he was the Director of the £7.5m EPSRC Interdisciplinary Research Collaboration in Advanced Knowledge Technologies (AKT). He is the Chief Technology Officer of Garlik, a company formed to exploit semantic web technology to enhance consumers' and citizens' privacy. He is also a founding director of the Web Science Research Initiative (WSRI). From 2001 to 2004 he was Editor in Chief of IEEE Intelligent Systems. He is also a Fellow of the European AI Association (ECCAI).

Philosophical Engineering What makes our modern world distinctive is a coming together of science and engineering. Questions that we attempted to understand using pure reason and philosophy have fallen to the scientific and empirical approach. The science of thermodynamics allowed a radical breakthrough in technologies from the internal combustion engine to the refrigerator. The science of aerodynamics enabled enormous advances in the design of aircraft. Sometimes the engineering preceded the science and on other occasions the science was needed before the engineering could commence. However, in the modern era there has always been an intimate connection between the two - between synthesis and analysis. This talk will examine how this connection can be seen dramatically in the digital realm. In particular, the World Wide Web has produced an information fabric that requires analysis to understand its properties and engineering to ensure its effectiveness. The Web also embodies real human knowledge in a way that suggests we are entering a new era - an era where questions that were essentially philosophical in nature are appearing as engineering challenges. How can meaning be characterised and shared between computers on the Web? Can intelligence emerge as a consequence of large number of interactions and transactions on the Web? This and other questions will be reviewed together with the likely future development of a new discipline.

The Royal Academy of Engineering

As Britain's national academy for engineering, we bring together the country's most eminent engineers from all disciplines to promote excellence in the science, art and practice of engineering. Our strategic priorities are to enhance the UK's engineering capabilities, to celebrate excellence and inspire the next generation, and to lead debate by guiding informed thinking and influencing public policy.

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The Royal Academy of Engineering promotes excellence in the science, art and practice of engineering.

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