EPSRC
Engineering and Physical Sciences Research Council

Systems Engineering Workshop
15th February 2011
Expertise of Workshop Attendees

NOTE THAT THE WORKSHOP WAS HEAVILY OVER-SUBSCRIBED, AND SO ATTENDEES WERE CHOSEN TO REPRESENT AS MANY DIFFERENT ORGANISATIONS AS POSSIBLE. THERE ARE MANY UK SYSTEMS EXPERTS WHO ARE NOT INCLUDED HERE.

Name: Rob Alexander	**Institution: University of York**
e-mail: rda@cs.york.ac.uk	**Dept: Computer Science**

Please give a brief summary of your background and interests:

I graduated in Computer Science from Keele in 2001. After a year as a software engineer in the finance industry I joined York as a Research Associate. I obtained my PhD in 2007 and in April 2010 was appointed as a Lecturer.

My main research area is system safety, with a particular specialism in complex system of systems. My research has brought techniques from computer science to safety and systems engineering; my PhD work used multi-agent simulation and machine learning to find safety risks in systems of systems. More recently, I've used argumentation techniques from safety engineering to justify the validity of a plant ecology model. I currently supervise research on safety certification for autonomous vehicles and on real-time risk monitoring in complex military networks. I am currently collaborating on a bid on dependability of distributed sensornets, which is a new area for me, and will shortly co-supervise an EngD on using machine learning to combine security information from distributed data sources.

Name: Shaikh Faruque Ali	**Institution: Swansea University**
e-mail: sk.faruque.ali@gmaiil.com	**Dept: College of Engineering**

Please give a brief summary of your background and interests:

Dr. Ali is a Newton International Fellow in the University of Swansea, Swansea, UK. He served a Post-doctoral research fellow in Automatic Control Laboratory, IUT-Longwy, CRAN-CNRS, Nancy University, France in 2009. Dr. Ali obtained his doctorate in the Dept of Civil Engg, Indian Institute of Science, Bangalore in 2008.

Dr. Ali's current research area is energy harvesting and structural control. He is particularly interested in nonlinear semiactive vibration control using magnetorheological devices. His works include both development of suitable control algorithms for civil structures and their experimental verifications.
Dr. Ali is also interested in control of infinite dimensional systems and biomedical applications of control engineering.

Dr. Ali has published a book, a book chapter and has 9 journal and 14 international conference papers to his credit.

Name: Dr Marko Bacic	**Institution: Rolls-Royce**
e-mail: marko.bacic@rolls-royce.com	**Dept: Electrical Power and Control Systems**

Please give a brief summary of your background and interests:

b.1978, MEng DPhil. 2008 - present - Systems Architect, Rolls-Royce Plc. Design and specialist technical leadership of Advanced Tip Clearance Control Systems, Modulated Air Systems and a number of other systems and control engineering activities. I was also the control system architect in the preliminary system concept studies of Severn Barrage Tidal Generation Concept .
2003-2008 - University Lecturer in Control(fixed term) , Oxford University. Led a research group on the hardware-in-the-loop simulation of complex dynamic system interactions. EPSRC First Grant on Hardware-in-the-loop simulation of Unmanned Air Vehicles. US Air Force Office of Research Grant jointly with Graham Taylor(Biology) on applications of bird flight; Rolls-Royce/EPSRC CNA grant on Hardware-in-the-loop simulation of non-return-valves - air system interactions in aeroengines. 2006-2007 RAEng Industrial secondment to Renault F1 Team. Interests: Study and application of fundamental control principles and analysis techniques for design and control of complex engineering systems. Study of system interactions and coupling between electrical,mechanical and thermo-fluid systems

Name: Richard Beasley	**Institution: Rolls-Royce**
e-mail: richard.beasley@rolls-royce.com	**Dept: Development**

Please give a brief summary of your background and interests:

I am the Global Chief of Systems Engineering in Rolls-Royce. In this role I am the skill owner for Systems Engineering, and the capability owner for RR for the application of Systems Methods. I am the senior Systems Engineering specialist in rolls-Royce

My main interest is the effective application of Systems engineering- including effective process to allow it, tools and methods to support it, and the right level of systems skills (especailly Systems Thinking) to enable it make a different in the development, modification and support of complex equipment - such as the power systems RR design and produce

Name: Dr Joe Butterfield	**Institution: Queen's University Belfast**
e-mail: j.butterfield@qub.ac.uk	**Dept: Mechanical & Aerospace Engineering**

Please give a brief summary of your background and interests:

I am a lecturer in the School of Mechanical and Aerospace Engineering at Queen's University in Belfast where I am currently teaching Aircraft Systems Engineering and Design for Manufacture and Assembly. With a background in computer aided methods in engineering, I have been carrying out research in Product Lifecycle Management (PLM) systems and methods since 2003. My research interests and recent published material, have focused on the quantification of the benefits of the technology in terms of organisational learning, automatic time and cost generation and the extension of key functionality beyond manufacturing processes into the broader product lifecycle. Current and future work includes the addition of advanced engineering capability within PLM tools, to facilitate the use of more realistic part forms for assembly process and lifecycle planning. I am also looking at the applicability of digital tools and methods to support the design of complex aerospace structures using a systems engineering approach and have delivered my findings to date, to undergraduate Aerospace Engineers as part of their Systems Engineering Module.

Name: Kim Christensen	**Institution: Imperial College London**
e-mail: k.christensen@imperial.ac.uk	**Dept: Physics**

Please give a brief summary of your background and interests:

Prof. of Theoretical Physics. I work in the fields of statistical mechanics and complexity science with an emphasis on non-equilibrium systems to address the spontaneous emergence of patterns and organisation in systems composed of many interacting parts. My research has been a unique integration of theoretical, computational and experimental studies of complex systems, involving a rigorous mathematical approach to pioneer new ways of analysing such systems. I am the principal author of a ground-breaking textbook "Complexity and Criticality" (ICP 2005), which sets out the mathematical foundations of complexity science in a rigorous but pedagogical manner. A second edition of the book is under preparation.

My main interest is to apply complexity science to a wide variety of real world challenges in engineering and medicine. The synergy required to create breakthroughs in the theory and applications of complexity science can only be achieved in a closely knit collaboration. The benefit is mutual as it will allow both complexity science and the application area to advance substantially.

Name: Dr Simon Colby	Institution: BAE Systems Maritime Missions Systems
e-mail: Simon.a.colby@baesystems.com	Dept: Future Systems

Please give a brief summary of your background and interests:

BAE Systems Maritime is the leading provider of warships and submarines to the Royal Navy. The Mission Systems team within Maritime is charged with developing, integrating and supporting the complex electronic and IT systems that enable those vessels to execute their missions.
The Future Systems team within Maritime Mission Systems is charged with setting the future evolution path for our key products which are the complex mission systems fitted to warships. We are interested in technologies, techniques and approaches that will provide capability to the warfighter, that will help to automate and reduce the complexity of the overall warship management task and that will reduce the cost of supply and support of these systems. Current themes include open systems architectures, information management, situational awareness and the use and integration of remote systems and uninhabited autonomous vehicles in to the wider warship mission system.

Name: Prof Lee Cronin	Institution: Glasgow University
e-mail: lee.cronin@glasgow.ac.uk	Dept: Chemistry

Please give a brief summary of your background and interests:

The research of the Cronin Group (www.croninlab.com) is characterised by its uncompromising commitment to phenomenon-based research that cuts across traditional boundaries. Cronin is making the transition to be a 'systems chemist' cultivating a fascination for complex chemical systems and the desire to construct complex functional molecular architectures and molecular materials. In particular we aim to develop new synthetic ideas and concepts for the design and self assembly of novel and functional systems.

Cronin is the PI of an EPSRC Programme Grant on systems approaches to nanoelectronics, a grant looking at the development of artificial living systems as well as a sandpit grant that combines chemistry and chemical engineering to the manufacture of chemical entities using an evolvable reactor system. Cronin is also the director, with Richard Cogdell of Glasgow-Solar-Fuels - a project in chemical and biological systems that seeks to convert sunlight into fuel (with CO_2 and water).

Name: Damien Culley	**Institution: National Grid**
e-mail: damien.culley@uk.ngrid.com	**Dept: Research and Development**

Please give a brief summary of your background and interests:

I work for the Electricity Transmission Research and Development Team. As part of my role it is my responsibility to ensure that National Grid is focusing its R&D activities where most appropriate and cost effective. As part of this is our view that National Grid needs to look outside of our traditional research areas in order to ensure that we meet the research challenges of the future. Engagement with the systems engineering community will be key as the electricity networks become increasingly complicated in design, construction and operation.

Name: Paul Davies	**Institution: Thales UK Ltd**
e-mail: paul.davies@uk.thalesgroup.com	**Dept: Defence Mission Systems**

Please give a brief summary of your background and interests:

Head of Innovations, Thales UK (Defence Mission Systems domain, Aerospace).
Responsible for £400k per annum R&T budget in future systems, including SE.
Past President, INCOSE UK.
Organiser of joint Industry / Academia / Government day, international Conference on Systems Education & Research (CSER), Loughborough April 2009.
Presenter on SE Research Agenda topics at 3 INCOSE international conferences, and participant in Working Group on same topic.
Member, Thales UK Steering Board on Systems Engineering.
Royal Academy of Engineering Visiting Professor in Integrated Systems Design at Loughborough University, 2007-9. Member of SE Education Steering Group there.
Research interests in SE: Value of SE to projects; SE in Innovation; Knowledge Management; Visual Analytics as a tool for insight into complex system design; Concurrent Engineering.
NDIC SE & OA NTC, Thales representative delegate for working party on SE.

Name: Paola Di Maio	Institution: ISTCS.org
e-mail: paola.dimaio@gmail.com	Dept: Research Strategy

Please give a brief summary of your background and interests:

I have been a systems analyst and engineer working in industry for a decade, specialising in distributed information systems (the web).

I came back to the UK after working overseas for five years, and started the Institute for Socio Technical Complex Systems, Edinburgh UK, of which I am a co-founder and director.

I am a member of INCOSE (The international council for Systems Engineering) where I am a contributor to the 'systems science' and 'body of knowledge' working group.

I specialise in knowledge models and knowledge reuse, and currently working on a study to assess the adoption fo knowledge reuse artefacts in systems engineering in the UK. I am the author of several publications and give talks, lectures, seminars, organise workshops.

Name: Dr Zhengtao Ding	Institution: University of Manchester
e-mail: zhengtao.ding@manchester.ac.uk	Dept: Electrical and Electronic Engineering

Please give a brief summary of your background and interests:

Dr Ding is a senior lecturer in control engineering. He obtained his BEng in Mechanical Engineering and Energy from Tsinghua University, MSc in Systems and Control and PhD in Control Systems from University of Manchester. His research interests mainly cover nonlinear and adaptive control of dynamic systems and control applications. In the recent years, he has been working on output regulation and asymptotic rejection of periodic disturbances of nonlinear dynamic systems, which was supported by EPSRC. He is keen in applying nonlinear control methods to general systems and engineering problems. Some of his current projects in systems and control applications include data based control of wireless communication systems, estimation of amplitude and phase for rejection of sub-harmonics in power systems, observer design and control investigation of circadian gene networks. Dr Ding is looking forward to broadening his contacts in industry and academic circle, and to promoting applications of some of the latest theoretic developments in nonlinear and adaptive control systems.

Name: Prof. John Dinwoodie	Institution: U. of Plymouth Business School
e-mail: jdinwoodie@plymouth.ac.uk	Dept: School of Management

Please give a brief summary of your background and interests:

Chair Maritime Logistics; Leader, International Shipping and Logistics Group, School of Management, University of Plymouth Business School.
Current interests:
- PI (Plymouth) Low Carbon Shipping: A systems approach in a consortium led by UCL. Interests in macro-economics and shipping cycles.
- Lead academic, Knowledge Transfer Partnership with Falmouth Harbour Commissioners (ESRC/NERC funded). This work developed a systems approach to a sustainable management system for small/ medium sized ports. This issue is important because as host to over 600 harbour authorities, Europe's largest port industry, current methodologies (eg Ecoports initiatives) bypass smaller authorities. A systems approach is required to develop and implement this initiative further.
- Also Director of Studies / PhD supervisor to several researchers in the field of International Maritime security, Port Management and related areas which frequently draw on systems methodologies.

Name: David Dodd (Meng,CEng MIMechE)	Institution: Rolls-Royce
e-mail: David.Dodd@Rolls-Royce.com	Dept: Low Carbon Strategic Research Centre

Please give a brief summary of your background and interests:

Over 7 yrs experience working within Rolls-Royce plc, predominantly within the Nuclear sector, covering both Submarine Propulsion Systems and Civil Nuclear and I have recently joined the Low Carbon team, working on developing technologies.

The bulk of my experience and interest in Systems Engineering to date is related to my time spent on a future nuclear plant design programme, where I implemented a systems engineering approach to whole plant, system and component concept design, focused on eliciting requirements, Quality Function Deployment, functional analysis, function means analysis and concept assessment / decision making. The logical approach and sheer power of this way of thinking resonated with my approach to problem solving and emphasised the importance of systems thinking in all design scenarios, particularly where complex interfaces are to be managed, as in this case. I have since used systems thinking and associated methods to aid the development of organisational structures, and develop understanding of capability requirements within a new business.

Name: Alex Duffy	**Institution: University of Strathclyde**
e-mail: alex.duffy@strath.ac.uk	**Dept: Design Manufacture & Engineering Management**

Please give a brief summary of your background and interests:

Alex Duffy is currently the Vice-Dean of Research in the Faculty of Engineering, University of Strathclyde, editor of the Journal of Engineering Design and has served as the President and Vice President of the Design Society. His main research interests include decision support, knowledge modelling, design performance, process optimisation, and integrated design management. He is a partner in EPSRC's Systems Engineering Doctorate Centre being led by Loughborough University, has co-ordinated an FP5 EU technology platform project in distributed life-cycle management (12M€, with 36 partners), was one of five topic leaders on VIRTUE, an 18M€ EU project with 23 partners working on integrated Computational Fluid Dynamics, one of four topic leaders on NECTISE (Network Enabled Capability Through Innovative Systems Engineering) an £4M joint EPSRC and BAE Systems project involving 10 UK university partners, and was a partner in SAFEDOR an 18M€ EU project on Risk-Based systems design with 52 European partners.

Name: Peter Earp	**Institution: Jaguar Land Rover**
e-mail: pearp@jaguarlandrover.com	**Dept: Electrical & Electronic Engineering**

Please give a brief summary of your background and interests:

As a Senior Manager within the Electrical & Electronic Engineering department of Jaguar Land Rover I have many years experience in managing the design, development and implementation of Automotive Electronic Systems. Having managed a Systems Integration team for some years I am fully aware of the challenges of Design and Integration of complex Vehicle Electronic Systems, and I have often observed the lack of 'Design for Integration'.

My current role is leading a cross business team in the development of improved Process, Methods, Tools and information management, for the delivery of Electronic Systems & Software.

A foundational element of our strategy is to adopt best practices around Systems Engineering.

Name: Tim Embley	**Institution: Costain**
e-mail: tim.embley@costain.com	**Dept: Technical Engineering**

Please give a brief summary of your background and interests:

Tim Embley is responsible for research and innovation across the £1bn turnover construction and engineering business. The business delivers solutions to national needs and focuses on customers in water, waste, health, education, airports, highways, marine, rail, nuclear process, power, and hydrocarbons. The innovation role covers technical solutions and business solutions.

Name: Dr Neil D. Evans	**Institution: University of Warwick**
e-mail: neil.evans@warwick.ac.uk	**Dept: School of Engineering**

Please give a brief summary of your background and interests:

I obtained my PhD (1999) in nonlinear control of infinite dimensional systems and was appointed to the academic staff of the School of Engineering (Warwick) in 2003. I have teaching responsibilities in the general area of engineering mathematics and in the specialist areas of systems modelling and simulation, and control.

I belong to the Systems, Measurement and Modelling Research Group, and have been working in the area of biomedical systems modelling for the last twelve years; including modelling of bacterial peptidoglycan biosynthesis, impact of maternal antibodies on childhood infections and interventions, antibody kinetics (particularly in multiple myeloma patients), fibril aggregation and disposition in amyloidosis, drug activity and targeting, drug effect (on cell cycle) and resistance, optimal dosing regimes.

My research is focused on the modelling, control and optimisation of biomedical and biological systems, and developing more computationally amenable methods for performing structural identifiability and indistinguishability analyses, which are concerned with what can be identified uniquely from the model output.

Name: Hans Fangohr	**Institution: University of Southampton**
e-mail: fangohr@soton.ac.uk	**Dept: Engineering Sciences**

Please give a brief summary of your background and interests:

My undergraduate degree is in Physics, my PhD in High Performance Computing, and I am currently Professor of Computational Modelling in the School of Engineering Sciences at Southampton.

I lead work on the simulation of materials and devices at the nanosctructure, but have a number of interdisciplinary collaborations where I provide the modelling methodology to support a quite different application area (such as signal networks in muscle tissue, or simulations of large networks of cars, or design optimisation of a new turbine-thruster device).

Beyond my own research, I am interested in the effective education and communication of insights to different target groups (including academic collueagues from other disciplines, PG and UG students, and the public).

Name: Suzanne Farid	**Institution: UCL**
e-mail: s.farid@ucl.ac.uk	**Dept: Biochemical Engineering**

Please give a brief summary of your background and interests:

I am a Reader in Bioprocess Systems Engineering and lead research into novel computer-based decision-support tools that provide systematic foundations to help companies make better decisions where there is inevitable uncertainty in process performance, market projections and clinical success rates. The research focuses on establishing and integrating models on bioprocess economics, manufacturing logistics, dynamic simulation, uncertainty analysis, multi-objective decision-making and combinatorial optimisation. The integrated decision-support tools are applied to industrially-relevant case studies for the design of cost-effective bioprocesses, capacity planning and R&D portfolio management. These new methodologies act as a test bed for the evaluation of alternatives and hence significantly shorten the time required to prioritise cost-effective manufacturing strategies to cope with future trends. These case studies focus on the development of new biopharmaceuticals and stem cell therapies.

Name: Seamus D Garvey	**Institution: University of Nottingham**
e-mail: seamus.garvey@nottingham.ac.uk	**Dept: Mech., Manuf. & Materials Eng.**

Please give a brief summary of your background and interests:

Since graduation, my career has always been connected to electromechanical systems. I worked for 6 years as a mechanical engineer in GEC ALSTHOM Large Electrical Machines, Rubgy. I then joined Aston University and remained there for 10 years during which time my main research was concentrated on the EPSRC/DTI LINK "Design of High Speed Machinery" programme. Since 2000, I have been Professor of Dynamics at the University of Nottingham involved in (almost) equal parts with electrical and mechanical dynamics.

I have strong "systems" credentials. For 10 years, I have taught "Integrated Systems Analysis" at Nottingham and I am the PI for the Royal Academy of Engineering visiting professor grant on "Integrated Systems Design".

I have abundant direct experience of systems thinking being important. One element of this arises from my current role as Director of the Rolls-Royce UTC in Gas Turbine Transmission Systems at Nottingham. We do substantial research in the coupled electromechanical dynamics of the electrical power system of aircraft and the mechanical transmission system driving the generators.

Name: Patrick Godfrey	**Institution: University of Bristol**
e-mail: Patrick.Godfrey@bristol.ac.uk	**Dept: Faculty of engineering**

Please give a brief summary of your background and interests:

Research interests: Systems thinking applied to complex engineering topics such as: infrastructure design, operations and management; uncertainty, risk, value and safety management and more recently systems for the built environment and sustainability.
Biography: Patrick Godfrey is Professor of Systems Engineering at the University of Bristol, and Director of the Systems Centre and the EPSRC Industrial Doctorate Centre in Systems at University of Bristol and University of Bath. Also EPSRC National Advocate for IDCs and Chair of Steering Group for the Association of EngD (AEngD) also Fellow of the the Royal Academy of Engineering. Patrick has for most of his career been a Director of a large consulting engineering company - Halcrow, where he specialised in the design of offshore oil and gas structures and more recently developed an innovation leadership position pioneered new ways of thinking about and managing the complete life cycle of large construction projects by developing the interface between business and engineering.

Name: Dr Phil Greenway	**Institution: BAE Systems**
e-mail: Phil.Greenway@baesystems.com	**Dept: SEIC**

Please give a brief summary of your background and interests:

I am the Head of the Systems Engineering Innovation Centre, a collaboration between BAE Systems and Loughborough University in the field of systems science and engineering. As such I have broad interests in new and emerging systems know-how, covering (among other things) emergence, complexity, architectures, modelling and analysis, tools and processes, and applied systems engineering. I am particularly interested in managing the exponential rise in complexity in (network enabled) systems, understanding and managing emergence, especially in cooperative autonomous systems, and applying model based systems engineering to shorten and improve technology development cycles, including "bridging the valley of death".

Name: Prof Kevin Gurney	**Institution: University of Sheffield**
e-mail: k.gurney@shef.ac.uk	**Dept: Psychology**

Please give a brief summary of your background and interests:

I have formal training in maths, theoretical physics, and engineering (digital systems), and have conducted research in engineering (neural networks), experimental psychology (vision) and computational neuroscience (my main focus for 15 years).
My work addresses fundamental problems in sensorimotor integration and cognition in animals, and the application of that understanding in robotic artefacts. In particular I have been working largely on the problem of action selection - 'how do we decide what to do next' - and its substrate in the brain (basal ganglia and related circuits). The specific system I have been looking at is that of gaze control and visual attention ('how do we decide where to look next'). I am particularly interested in working at multiple levels of description: from detailed models of individual neurons, through neural microcircuits up to complete brain systems and their embodiment in behaving agents (animals and robots)

Name: Harald Haas	Institution: The University of Edinburgh
e-mail: h.haas@ed.ac.uk	Dept: Institute for Digital Communications

Please give a brief summary of your background and interests:

Harald Haas received the Ph.D. degree from the University of Edinburgh in 2001. From 2001 to 2002, he was project manager at Siemens AG (Information and Communication Mobile Networks) for a research project with Chinese and German universities on new radio access technologies for 4th generation wireless systems. He joined the International University Bremen (Germany), now Jacobs University Bremen, in September 2002 as Associate Professor of electrical engineering. In June 2007, he joined the University of Edinburgh where he is Professor of Mobile Communications in the Institute for Digital Communications (IDCOM). Since June 2010 he is member of the EPSRC ICT Early Career Focus group. His main research interests are in the areas of wireless system design and digital signal processing, with a particular focus on interference management in wireless systems, multiple antenna systems and optical wireless systems. He is currently working towards a spin-out company formation on visible light communications aiming at commercialising his recent innovations in this area.

Name: Jim Hall	Institution: Univesity of Oxford
e-mail: jim.hall@ncl.ac.uk	Dept: Environmental Change Institute

Please give a brief summary of your background and interests:

Professor Jim Hall FREng is Professor of Climate and Environmental Risks and Director of the Environmental Change Institute in the University of Oxford. He is a civil engineer with a background in systems modelling of flood and coastal risks and has in recent years work extensively on problems of adapting to climate change. During his career he has been responsible for some major integrated systems modelling initiatives, most recently, development of the Tyndall Centre's Urban Integrated Assessment model, which simulate process of change for the whole of London over the timescale of the 21st Century. He now directs the EPSRC's Infrastructure Transitions Research Consortium, which is developing new systems models for the analysis of national infrastructure systems (energy, transport, water, waste and ICT). Prof Hall's work has had a major impact on UK engineering policy and practice. He is the engineer on the UK's independent Committee on Climate Change Adaptation which was brought into being by the 2008 Climate Change Act.

Name: Alan Harding	**Institution: BAE Systems**
e-mail: alan.d.harding@baesystems.com	**Dept: Systems Engineering**

Please give a brief summary of your background and interests:

I lead the BAE Systems UK systems engineering (SE) functional council, and hence am a stakeholder in identifying needs for SE research and collaborating with academic organisations to meet our needs.

My specific areas of SE development (including actual/potential research needs) are Capability Engineering, Systems of Systems, Safety, and within the wider business Model-Based Systems Engineering.

In November 2010 I was appointed a BAE Systems P&S/I Fellow in Systems Engineering.

I am active in INCOSE UK, being the current President-Elect, so am familiar with the wider UK SE context.

Name: Jeremy Hilton	**Institution: Cardiff University**
e-mail: jeremy.hilton@cs.cardiff.ac.uk	**Dept: School of Computer Science and Informatics**

Please give a brief summary of your background and interests:

I am a chartered engineer, joining Cardiff from the commercial world in 2005. a leading member of the Strategic Information Systems Sub-group within KIS in the School, concentrating on information security and privacy, resilience, organisational learning and change. I have just been appointed Principal Research Fellow at Cranfield University (The Defence Academy at Shrivenham), starting in Jan 2011, to establish a research agenda in Systems Engineering and Human Systems. I am PI an EPSRC-funded research project entitled Curative Resilience Scoping Study, which takes a systems engineering approach to capturing what the human body does in order to be resilience, and make this available to organisations and communities such they can adapt to become more resilient. I have also just completing a TSB-funded project with Cambrensis Ltd which has developed a method and tool to enable a systemic view of risk through dependency modelling. I teach systems thinking and systems theory, and apply systems methods to a wide range of organisational and systems problems.

Name: Prof George W Irwin	**Institution: Queen's University Belfast**
e-mail: g.irwin@qub.ac.uk	**Dept: Electronics, Electrical Engineering and CS**

Please give a brief summary of your background and interests:

Prof George Irwin is Research Director of Intelligent Systems and Control at Queens University Belfast, where he holds a personal Chair in Control Engineering. He was Research Director of the QUB Virtual Engineering Centre for 5 y He has been elected Fellow of the Royal Academy of Engineering and Member of the Royal Irish Academy. A Chartered Engineer, he has just been elected a Fellow by IFAC, the International Federation of Automatic Control, one of only nine worldwide. He is also an IEEE Fellow, a Fellow of the IEE, a Fellow of the UK Institute of Measurement and Control

Prof Irwin's research covers identification, monitoring, and control, including neural networks, fuzzy neural systems and multivariate statistics, much of which involves industrial collaboration. He was Technical Director of Anex6 Ltd, a University spin out company specialising in process monitoring. He has published over 350 research papers and 12 edited books. His recent work has been on wireless networked control systems, fault diagnosis of internal combustion engines and novel techniques for fast temperature measurement.

Name: Dr Ben Jeppesen	**Institution: Instron - Division of ITW Ltd**
e-mail: Ben_Jeppesen@instron.com	**Dept: Engineering R&D**

Please give a brief summary of your background and interests:

I studied a general engineering degree with mechanical and control specialisms, and a PhD in control/'system engineering', the system being an articulated truck with active suspension. I have worked for several companies that manufacture fairly complex systems:

GEC-Marconi (now part of BAE systems), Laser Systems Dept.
Rover Group.
Robert Bosch GmbH (vehicle stability control systems)
Instron (materials testing instruments).

I have a general interest in complex systems, especially simulation, design and control system design

Name: Prof Peter Johnson	**Institution: University of Bath**
e-mail: p.johnson@bath.ac.uk	**Dept: Computer Science**

Please give a brief summary of your background and interests:

My background is in Social and Computer Sciences in which my past research has addressed interactive systems design and evaluation questions. Most notably being my work on model-based design and participatory design.

My current research interest are in the following broad areas:
Large-scale collaboration & collaborative systems
Technologies to support co-design and inter-agency working
Collective intelligence & social inclusion.

This includes current research (£2.1m - BAE Systems) to investigate collaboration in autonomous systems and novel interaction for service use and service design (£640k EPSRC MVCE). In other current research we have investigated collaborative technologies to support creativity and internet-technologies to support social interaction in the aged. I sit on the MoD Defence Scientific Advisory Council.

Name: Dr. R. Peter Jones	**Institution: University of Warwick**
e-mail: Peter.Jones@warwick.ac.uk	**Dept: School of Engineering**

Please give a brief summary of your background and interests:

My interests are in applying systems engineering approaches, in particular model based techniques, in the design, development and validation of systems within automotive vehicles. This work started with powertrain systems, in the early 1980's and progressed to advanced chassis systems, in the early 1990's. More recent work is addressing the interactions between powertrain and chassis systems. All of the work has been carried out in collaboration with industrial companies and most has involved funding from the EPSRC, including the Warwick Innovative Manufacturing Centre (WIMRC).
Since 2003, my research activities have extended to embrace the challenges surrounding the integration of complex, networked control systems in automotive vehicles. Such systems have particular properties, e.g. emergent behaviour which is the effect of unforeseen interactions within the network, a characteristic of a "system of systems".
From 2006 to 2010 the work has been carried out via a £11.4m collaborative project with Jaguar Land Rover, add2 and QinetiQ, involving funding of £4.5m from the TSB Validation of Complex Systems initiative. Related work is also supported by the WIMRC.

Name: Prof. Visakan Kadirkamanathan	Institution: The University of Sheffield
e-mail: visakan@sheffield.ac.uk	Dept: Automatic Control & Systems Engineering

Please give a brief summary of your background and interests:

I am currently the Head of Department and Professor of Signal and Information Processing. After completing my BA and PhD in Cambrige University, I began my academic career in Sheffield in 1993.

My research interests are represnted by the activities of the Centre for Signal Processing and Complex Systems which I co-founded with Professor Billings in our Department. Our research is based on developing nonlinear and spatiotemporal dynamic models, determined from data, and yet has interpretive capability to the application of interest. Our portfolio of research spans life science (stem cells, neutrophils, synthetic biology), neuroscience (optical tomography, neural processing in drosophila), healthcare (EEG based epilepsy detection), environment (glacial melt modelling, solar weather), energy (wind turbine monitoring), transport (aerospace engine monitoring) and robotics (swarms). The portfolio of research activities are supported by RCUK, including a Platform Grant that was successfully renewed in 2009.

Name: Professor Roy S. Kalawsky	Institution: Loughborough University
e-mail: r.s.kalawsky@lboro.ac.uk	Dept: Research School of Systems Engineering

Please give a brief summary of your background and interests:

Current role: Director of Research School of Systems Engineering and Technical Head of Systems Engineering Innovtion Centre, Loughborough University. Also I am adjunct professor (systems engineering) at the University of Southern Australia (Adelaide) and the International Board member of the Defense and Systems Institute in Adelaide. Previously, I spent 18 years working for BAE Systems as a systems engineer responsible for advanced crew station research and development focusing on modeling, simulation, human factors and systems engineering.
My current research involves the close integration of systems, human factors and advanced modeling/simulation with particular interest in synthetic environments and advanced visualization in support of visual analytics. I lead a number of important research projects involving the coupling of systems models to create an executable trade-space where solutions can be synthesized and optimized against multi-criteria.

Name: Professor Izzet Kale	Institution: University of Westminster
e-mail: kalei@wmin.ac.uk	Dept: Electronic Systems

Please give a brief summary of your background and interests:

I work in the area of low/high-level system modeling, design, simulation, implementation and test, in the field of communications, GNSS positioning and biomedical imaging systems.
I have many years of experience working on applied research projects for industry's next generation product oriented problems on the above mentioned areas.

Name: Professor Richard Kitney	Institution: Imperial College
e-mail: r.kitney@imperial.ac.uk	Dept: Dept of BioEngineering

Please give a brief summary of your background and interests:

My background and interests are that I am Professor of BioMedical Systems Engineering at Imperial College and have a long standing interest in biomedical information systems. This work over a number of years includes, not only work at the clinical and physiological levels but also at the molecular levels. I am currently the PI on a major EPSRC grant relating to IT Applied to Clinical Pathways (EP/H019804/1).

Name: Dr Martin Lakie	Institution: University of Birmingham
e-mail: m.d.lakie@bham.ac.uk	Dept: School of Sport and Exercise Sciences

Please give a brief summary of your background and interests:

My background lies in studying human neurophysiology. I am the PI for the EPSRC funded project EP/F06974X/1.) This project is part of a three centre EPSRC funded project "Intermittent Predictive Control of Man and Machine" . This whole project is developing the theoretical basis of intermittent, predictive control and using intermittent control as a new paradigm for machine control and for understanding human physiological control of movement. For the past half century, physiological control systems at almost all system levels have been interpreted using continuous control models such as the servo mechanism and the continuous optimal control mechanism. These continuous controllers are high bandwidth mechanisms with low control delays suitable for using low noise sensors and actuators to control machines. Biological control systems are typically noisy and low bandwidth with long (sometimes very long) time delays. Intermittent control is designed for low bandwidth systems and thus provides a new paradigm for understanding biological control systems.

Name: Chris Lamb	Institution: Sula Systems Ltd
e-mail: clamb@sula.co.uk	Dept:

Please give a brief summary of your background and interests:

I am the Systems Engineering Head of Profession within a leading SE Consultancy, especially active in the Defence & Aerospace sectors. I initiate and guide internal SE Research, fee earning SE Research for clients organisations, and have wide exposure to current SE practices used across a wide range of government and industry. This gives me insight into areas of weakness in current practices that are highlighting areas for potential research from central funding.

I am also the Chair of the UK Advisory Board to INCOSE, a group with representatives from most major organisations involved in SE in the UK. These include universities, industrial primes and system developers, government organisations and consultancies. One of our active themes is to promote coordination of the SE Research agenda in the UK, to the advantage of all concerned.

Sula is also active in this area within the Systems Engineering & Open Architectures National Technical Committee of the Aerospace and Defence KTN.

Name: Ming K Lim	Institution: Aston University
e-mail: m.k.lim@aston.ac.uk	Dept: Engineering Systems & Management

Please give a brief summary of your background and interests:

I am currently a lecturer in logistics and founding Head of RFID Advanced Research (www.therfid.com) at Aston Uni. Prior to this, I was appointed as Business Improvement Manager at ePI International, managing a team of knowledge engineers in identifying operations improvement solutions, and a research fellow at Exeter University on an EPSRC grant in reconfigurable supply chain research. My expertises are radio-frequency identification (RFID) technology, sustainable supply chain management, green logistics, reconfigurable manufacturing/supply network, and cost & system optimisation. Earlier this year, I was awarded an EPSRC First Grant on using RFID to promote sustainable logistics operations, aimed at bringing impact to the transport industry. I have strong collaboration with large organizations (such as NHS, DHL), SMEs from various industry sectors, and research institutions (e.g. Aalborg Uni. Denmark, Logistics Institute Singapore & Xiamen Uni. China). I have on-going cross-disciplinary projects, e.g. with Health Sciences colleagues using telemetry to enhance student learning, with a venture capitalist to develop a cyclist safety tool for use in big cities and with a SME on cloud computing taxonomy.

Name: Honghai Liu	Institution: University of Portsmouth
e-mail: honghai.liu@port.ac.uk	Dept: School of Creative Technologies

Please give a brief summary of your background and interests:

My research interests are focused on computational intelligence and its application with an emphasis on enhancing real-time performance of algorithms via application contextual information. I have pioneered a theoretical framework of fuzzy qualitative reasoning to bridge the gap between different types of representations, and it has been implemented into four applications, namely, multifingered robot manipulation, vision based human motion analysis, fault diagnosis for large-scale marine engines and intelligent vehicle control within a real-time context. This groundbreaking research has provided a novel way to handle computational cost and information accuracy through introducing contextual information. It has been recognised by peers with three Best Paper Awards and one Best Competition Prize in international leading conferences, and numerous journal articles. It is evident that my research has led to substantial academic, social and economic impact; my future research is focused on Research Councils UK priorities around assisted living.

Name: Ian Loram	Institution: Manchester Metropolitan University
e-mail: i.loram@mmu.ac.uk	Dept: Institute for Biomedical Research into Human Movement and Health

Please give a brief summary of your background and interests:

My background lies in studying human motor control. I am the PI for the EPSRC funded project EP/F068514/1 which integrates engineering control theory with human physiological control of movement. This project is part of a three centre EPSRC funded project (EP/F068514/1; EP/F069022/1; EP/F06974X/1) "Intermittent Predictive Control of Man and Machine" for which I am the lead PI. This whole project is developing the theoretical basis of intermittent, predictive control and using intermittent control as a new paradigm for machine control and for understanding human physiological control of movement. For the past half century, physiological control systems at almost all system level have been interpreted using continuous control models such as the servo mechanism and the continuous optimal control mechanism. These continuous controllers are high bandwidth mechanisms with low control delays suitable for using low noise sensors and actuators to control machines. Biological control systems are typically noisy and low bandwidth with long time delays. Intermittent control is designed for low bandwidth systems and thus provides a new paradigm for understanding biological control systems.

Name: WAYNE LUK	Institution: IMPERIAL COLLEGE
e-mail: w.luk@imperial.ac.uk	Dept: COMPUTING

Please give a brief summary of your background and interests:

I am Professor of Computer Engineering at Imperial College London. I founded and lead the Computer Systems Section and the Custom Computing Group in Department of Computing, and was Visiting Professor at Stanford University and Queen's University Belfast.

I received a Research Excellence Award from Imperial College London, and eleven awards for publications from various international conferences. I am a Fellow of the IEEE and the BCS. I am PI for many projects supported by EPSRC (including two platform grants), by European FP6 and FP7 schemes, and by many companies including Altera, Celoxica, Maxeler, J.P. Morgan, Nokia, Sharp, and Xilinx.

My research interests include all aspects of computer engineering, particularly those involving reconfigurable computing, field-programmable devices and systems, and design automation.

Name: Prof. Bart MacCarthy	Institution: University of Nottingham
e-mail: bart.maccarthy@nottingham.ac.uk	Dept: Business School

Please give a brief summary of your background and interests:

Bart is Professor of Operations Management at Nottingham University Business School.

His research spans the analysis, modelling and management of operational systems in a wide range of sectors. He is European Editor for the International Journal of Production Economics and a member of the Editorial Board for the International Journal of Operations and Production Management, and the Journal of Manufacturing Technology Management. He is a member of the Board for European Decision Sciences Institute and is a Fellow of the Institute of Mathematics, the Institute of Operations Management and the Institution of Engineering and Technology. He has researched and consulted with a wide range of industries including textiles and clothing, automotive, aerospace, engineering, consumer products and food. He was part of the ESPRC's Systems Integration in the early 2000s. He believes strongly that new thinking is required in systems science, systems design and engineering, the planning and management of systems and in assessing the economic value of systems

Name: Prof. Jan Maciejowski	Institution: University of Cambridge
e-mail: jmm@eng.cam.ac.uk	Dept: Engineering

Please give a brief summary of your background and interests:

I am a Control Engineer with 30+ years of experience as an academic, preceded by 3 years in the space industry (where my job title was 'Systems Engineer'). I am a Professor of Control Engineering, and Head of the Information Engineering Division at Cambridge, which includes Signal Processing and Communications, Speech and Vision systems, and Machine Intelligence/Machine Learning, as well as Control.

My own research is on 'Predictive Control', which involves the use of online optimisation for real-time decision-making in uncertain environments. This often gives rise to apparently 'intelligent' behaviour of systems. The interesting questions are: how far can this be pushed, and when is it the most appropriate approach to take? In addition to advancing the theory, we are currently working on applications to Space rendezvous, Air-traffic management, Autonomous vehicles, and Paper manufacturing – in some of these cases with an emphasis on energy saving.

Name: Dr Harris Makatsoris	Institution: Brunel University
e-mail: harris.makatsoris@brunel.ac.uk	Dept: School of Engineering

Please give a brief summary of your background and interests:

I am a Senior Lecturer in Manufacturing and Engineering Systems and the Head of Research for the Advanced Manufacturing and Enterprise Engineering division in the School of Engineering and Design. I am also the founder and director of the interdisciplinary research centre the London Institute for Enterprise Performance, Sustainability and Systems (LIFEPASS), concerned with developing systems for sustainable enterprises. I have published 44 papers and delivered key note speeches at international conferences to date primarily in the area of Systems Engineering. My research interests are wide ranging in the modelling, optimisation and control of complex engineering and natural systems areas. I currently lead an interdisciplinary research group engaged in integrated research in the area of multi-scale systems. I am a Chartered Engineer and a Member of the Institution of Mechanical Engineers. I have a first degree in Mechanical Engineering and a PhD in Systems Engineering both from Imperial College London and 14 years work experience in academia and in the software industry.

Name: Ian Marshall	Institution: Lancaster University
e-mail: i.w.marshall@lancaster.ac.uk	Dept: Environment/Computing

Please give a brief summary of your background and interests:

I spent 20 yrs working for BT (high speed fibre optic systems, network planning, corporate strategy, network and service management software, ad-hoc wireless networks). I then undertook a Royal Society industry fellowship with UCL EE, developing intelligent sensor network systems. This led to establishing an academic career, first with the University of Kent (Computing) and currently at Lancaster University (Environment Centre and computing). My current interests focus on human decision making as practised in science and management, and on the development of tools/methods that support effective synthesis and interpretation of available facts, together with planning future actions based on the available facts. These tools and techniques are being applied in hazard management, system management in utilities, biodiversity/conservation, and carbon reduction (minimise energy use and plan renewable generation capacity).

Name: Prof Gary Montague	Institution: Newcastle University
e-mail: gary.montague@ncl.ac.uk	Dept: Chemical Engineering

Please give a brief summary of your background and interests:

As a chemical engineer by first degree training, I subsequently went on to undertake postgraduate study in control systems. Since then I have been an active researcher in the field of process systems analysis and control. I currently lead the University Research Centre in Biopharmaceutical and Bioprocessing Technology. The Centre coordinates multidisciplinary research in systems analysis with application in the biopharmaceutical sector. I am also Head of School of Chemical Engineering and Advanced Materials at Newcastle University. The School has a long tradition of process systems science and its application in a broad range of sectors. This I am actively continuing to support. My major research commitment currently is based around my involvement with the EPSRC supported Engineering Doctorate in Biopharmaceutical Process Development where systems engineering concepts are being exploited for industrial benefit and providing system engineers with industrial research training.

Name: Eva María Navarro López	Institution: The University of Manchester
e-mail: eva.navarro@cs.man.ac.uk	Dept: School of Computer Science

Please give a brief summary of your background and interests:

I am endlessly curious and enthusiastic. My education culminated in 3 degrees - in engineering (control systems, computer science) and applied mathematics - and 2 PhD degrees: in Automatic Control (completed) and Celestial Mechanics and Space Dynamics (unfinished). My work has been highly multi-disciplinary, mixing theory and practice, cutting across boundaries of different disciplines, and with strong links in the energy industry sector. My main field is dynamical systems and control engi- neering. My major contributions have been in the analysis and control of nonlinear discrete-time and discontinuous/switched systems. I worked in the oil industry for four years, leading projects/consultancies related to exploration and production (mainly drilling) and optimization of distribution and transportation networks. My current research is focused on hybrid dynamical systems. I am bringing together computer science models, control methodologies and dynamical-systems tools to control complex engineering systems and networks. I am devising the mathematical- -computational-control DYVERSE framework (EPSRC ref. EP/I001689/1). My work is visually summarised at http://www.cs.man.ac.uk/~navarroe/research/map

Name: David Oxenham	Institution: DSTL
e-mail: daoxenham@dstl.gov.uk	Dept: Chief Systems Engineer

Please give a brief summary of your background and interests:

David Oxenham is Chief Systems Engineer and a Senior Fellow of the MOD's Defence Science and Technology Laboratory (1) based at Porton Down in Wiltshire. His interests and activities are wide ranging with a common thread related to developing and applying a systems approach to complex problems in defence bringing together analysis, technology, military concepts and industrial capabilities; and developing the skills and capabilities to match within Dstl and other Government labs and Agencies.

David joined the Ministry of Defence (MOD) as a scientist in 1980 after completing a PhD in Low Temperature Physics at Birmingham University. His career has spanned research, trials, project support, operational analysis and programme management.

The first half of his career was spent at the Royal Aerospace Establishment and its successors leading teams carrying out research into aircraft and weapons navigation systems. In 1993, after a period managing a major weapons research programme, he moved to become Technical Manager (Air Studies) in the MOD's "Centre for Defence Analysis" (CDA - a part of the Defence Evaluation and Research Agency). There, he was responsible for leading a large part of MOD's air operational analysis study programme and played a significant role in advising the decisions for many of the UK's largest aircraft and weapon equipment acquisitions.

He left CDA at the end of 2000 to attend the Royal College of Defence Studies 2001 Course (2), returning to MOD's newly formed Defence Science and Technology Laboratory to take up a senior management role responsible for providing strategic leadership to Dstl's work programme for Maritime and Strategic Systems. This included formulation and design of new programmes and assessing the strategic implications for Dstl's capabilities. He held this role until early 2008.

David chairs an international Defence Research Collaboration Panel on "systems engineering for defence modernisation", is a member of two National Defence Industrial Council (NDIC) Working Groups; sits on Systems Engineering Advisory Boards for Imperial College and Bristol, Loughborough and Cranfield Universities. He is a member of the Peer Review College for the UK's Engineering and Physical Sciences Research Council.

He holds two visiting professor appointments:

- Bristol University: Royal Academy of Engineering VP for Sustainable Systems
- Imperial College, London: Royal Academy of Engineering VP for Integrated Systems Design

Additional Information:

1) Dstl is part of the Ministry of Defence. It is MOD's in-house centre of scientific excellence and delivers advice to support major decisions on defence policy,
defence equipment and military operations, solutions to complex systems problems and scientific research "most appropriately done in government". It is a 3* led organisation with about 3,500 civilian and military staff of which more than 2,500 are graduate scientists and engineers. All Dstl employees are Crown Servants.

Name: Dr Antonis Papachristodoulou	Institution: University of Oxford
e-mail: antonis@eng.ox.ac.uk	Dept: Engineering Science

Please give a brief summary of your background and interests:

I hold an undergraduate degree in Electrical and Information Sciences and a PhD degree in Control and Dynamical Systems with a minor in Aeronautics. My research focuses on the development of analysis and design tools for complex systems combining ideas from optimization, mathematics and dynamical systems. I have been applying these tools to several areas, from Aerospace to Biology and from ecological to power networks. I have been particularly interested in networked control systems - these systems are everywhere and our everyday life depends on them but methods for understanding how these work and how they fail are underdeveloped. I have been looking at several technological networks (such as Internet congestion control, Multi-agent systems and spacecraft rendezvous with Industry) but also how nature has used feedback control to ensure safe operation of the very complex processes that sustain life. More recently I have been looking at how systems engineering tools can be applied to biological systems and propose new designs/redesigns to improve or modify their behaviour (Synthetic Biology); and how to design and verify safety-critical technological systems.

Name: Prof Gerard Parr	Institution: University of Ulster
e-mail: gp.parr@ulster.ac.uk	Dept: School of Computing and Information Engineering

Please give a brief summary of your background and interests:

Gerard Parr holds the Full Chair in Telecommunications Engineering. He holds a PhD in Self Stabilizing Protocols which was done in part at DARPA USC-ISI in Los Angeles. Areas of research within the group include self-stabilizing protocols, interplanetary network protocols, real-time network management systems, Energy Aware Infrastructure, Resource Management Protocols, Applications Performance Management in Virtualised Environments. He was previously appointed as Member of the Northern Ireland Advisory Committee for OFCOM UK (the telecommunications/media regulator) which reports to the main board of OFCOM. In recent years he has been successful in attracting major EPSRC research funding for a project in Sensing Unmanned Aerial Vehicles that will involve colleagues from UCL, Oxford, UK Home Office, Thales, BAE Systems and Boeing USA. He has been instrumental in the development of a consortium of leading UK-India academia and industry (led by BT Innovate) to create the first EPSRC-DST India-UK Advanced Technology Centre(IU-ATC- http://www.iu-atc.com) of Excellence in Next Generation Networks Systems and Services. He is a Member of the EPSRC ICT SAT.

Name: Dr. Rushen Patel	Institution: Smith Institute for Industrial Mathematics and System Engineering
e-mail: rushen.patel@smithinst.co.uk	Dept:

Please give a brief summary of your background and interests:

My background is in control theory with particular reference to aerospace applications, where issues of system modeling, development of control policies and robustness to uncertainty are commonly encountered issues. My research interests include dynamic modelling & simulation, optimal control, model predictive control, path planning and mathematical programming.

The Smith Institute is an independent company that helps clients solve challenging industrial problems through the application of mathematics. We take a system engineering view of problems but operate to a high level of technical detail within a system. At the Smith Institute I work across many different industries, applying control and other techniques to various system engineering problems. Therefore I have a professional interest in seeing how industry and academia are tackling system engineering challenges.

Name: Ian Phillips	Institution: ARM Ltd
e-mail: ian.phillips@arm.com	Dept: R&D Department

Please give a brief summary of your background and interests:

Left school in 1965, Apprentice EE till 1970, Graduated (1st) in EE in 1974: I have worked in and around microelectronic design for 46yrs (HMG, Pye TMC, Philips, Plessey, GEC and ARM), during which time I have experienced most aspects of design and manufacture associated with components and systems. I have too much experience of the things that go wrong because Components are considered in isolation and not the building blocks of Systems. It has taught me to consider the system aspects of everything, not just the hardware/software technology of my formal training, but also of business and economies.

In the last 10-15yrs I have become more of a public figure in these domains and through which have acquired a public image in predominantly UK Universities, Industry and Government, and to a lesser extent in Europe. This is supported by my current role in ARM Ltd, where as Principle Staff Engineer I am encouraged to interface/support to this community. I am Visiting prof. at the Universities of Liverpool and Plymouth, sit on various committees for the UK Gov. and European Commission (Including TSB and EPSRC), and participate in advisory role in several University Research Programmes and European Projects.

In this context I was invited by EPSRC to participate in the Systems Engineering Focus Group.

Name: John Preston	Institution: University of Southampton
e-mail: jpreston@soton.ac.uk	Dept: Civil Engineering and the Environment

Please give a brief summary of your background and interests:

I am the Head of the School of Civil Engineering and the Environment and the Director of the Transportation Research Group (TRG). TRG views transport as a complex socio-technical system, with a particular research emphasis on intelligent transport systems. My own research focuses on the economic modelling of transport systems, for example of the capacity and resilience of the national transport system (in the EPSRC Infrastructure Transitions Research Consortium), the evaluation of sustainable transport initiatives (in the EC POINTER project) and the evaluation of engineering interventions to promote active travel (in the EPRSC iConnect project). I have particular expertise in rail research, having been involved in the EPSRC Rail Research UK initiative and the follow-up Cross Disciplinary Feasibility Account award.
I am leading the EPSRC/RSSB OCCASION project, that is examining rail nodal capacity, and am involved in the Track21 Programme Grant that is examining rail track systems. I am involved in Southampton Rail Systems Research (SR2) that brings together an interdisciplinary team to research issues related to infrastructure, operations, noise and vibration and human factors.

Name: Professor Alan Purvis	Institution: University of Durham
e-mail: alan.purvis@dur.ac.uk	Dept: School of Engineering & CS.

Please give a brief summary of your background and interests:

I am interested in Signal Processing and the way in which it enables complex engineering systems to be designed and managed.
We have worked in Durham on Radio Systems, Optical & Imaging Systems and Information Systems through EPSRC grants and studentships, European programmes and Direct contracts from Industry.

Recent topics of research include RFID systems, holographic imaging systems for true 3D TV, Memory System Test and Repair, Self Healing Systems, GPS search and rescue systems, System on Wafer tools.

We are interested in new projects on complex and coupled whole system design, test, validation and certification.

Name: Dr Ges Rosenberg	**Institution: University of Bristol**
e-mail: ges.rosenberg@bris.ac.uk	**Dept: Systems Centre**

Please give a brief summary of your background and interests:

My background:
*Author of "Systems Engineering Research: Stakeholder Needs: Stage 1 Workshop Report" written on behalf of Systems Engineering and Open architecture KTN.
*PhD in systems based approaches to managing uncertainty and environmental risk.
*Ten years' experience as an aerospace engineer in modelling and simulation of dynamic systems.
*Ten years' experience as Operations Director for medium sized enterprise, including leading change, developing organisational structures and business processes.
*Currently I am Visiting Fellow in the University of Bristol's Systems Centre and responsible for building partnerships across industry, with a focus on developing 'Systems Thinking' through research; working with industry to enhance performance; using systems-based approaches in design to create competitive advantage; and developing future engineering leaders.

Name: Susan Rosser	**Institution: University of Glasgow**
e-mail: s.rosser@bio.gla.ac.uk	**Dept: Inst Mol. Cell and Systems Biology**

Please give a brief summary of your background and interests:

I am a lecturer in biotechnology and my research is primarily in the emerging field of synthetic biology. We are interested in developing synthetic biology tools for engineering metabolic pathways (e.g. for biological fine chemical synthesis, drug production, bioremediation and biofuel production, directed evolution of novel enzymes (e.g. cold active enzymes for washing powders) and optimisation of microbial fuel cells.
We currently collaborate with bioinformaticians, mathematical modellers and control engineers to gain further insight into our biological systems and would like to further develope this aspect of the work in the future. In order for synthetic biology to reach its full potential there needs to be a greater understanding of the context of synthetic genetic circuits within the cell system, within communities and also within the physical confines of a reactor or fuel cell. These are all areas where a systems approach would be enormously valuable.

Name: Prof R Mark Rylatt	**Institution: De Montfort University**
e-mail: rylatt@dmu.ac.uk	**Dept: IESD**

Please give a brief summary of your background and interests:

Currently Professor of Intelligent Energy Systems at the Institute of Energy and Sustainable Development (IESD), I am a computer scientist with a background in computer science and artificial intelligence, and a substantial track record in the sustainable energy field with interests in urban scale energy modelling, geographical information systems, intelligent control, complex systems, and climate change impact and adaptation. I am currently "PI" for the IESD on two major consortium projects, the EPSRC funded Measurement, Modelling, Mapping and Management (4M), the EPSRC/E.ON funded Carbon, Control and Comfort, and consortium PI for the EPSRC funded CASCADE, which brings together social, economic, computer and complexity scientists and electrical engineers to investigate the implications of smart grid from a complex adaptive systems perspective. I am particularly interested in the potential of the emerging paradigm of complex adaptive systems engineering for building self adaptive systems with the ability to adjust their behaviour in response to changing operational and environmental contexts, inparticular to achieve greater energy efficiency and resilience.

Name: Prof Jim Scanlan	**Institution: Southampton University**
e-mail: j.p.scanlan@soton.ac.uk	**Dept: Engineering**

Please give a brief summary of your background and interests:

I currently hold a large EPSRC grant called DECODE (DEcision Environment for COmplex Systems Engineering) which is investigating tools and techniques for the design of alrge complex systems.
I have an interest in Systems Engineering having created a university spin out business (PLEXUS) that sells complexity management tools to companies including Rolls-Royce, Boeing, GE, Bombardier, Thales and other blue chip organisations.
I am just developing a new MSc course in unmanned vehicle systems design which includes a significant systems engineering component. This course is being supported by BAE systems, Thales, QinetiQ, Cobham.
I co-direct a Rolls-Royce UTC in design and have a number of PhD students working in the area of agenet based modelling to develop a deep understanding of systems behaviour and reliability.
I worked in the aerospace industry for nearly 15 years.

Name: Alwyn Seeds	Institution: UCL
e-mail: a.seeds@ee.ucl.ac.uk	Dept: Electronic and Electrical Eng

Please give a brief summary of your background and interests:

Alwyn Seeds served as a Staff Member at Lincoln Laboratory, Massachusetts Institute of Technology, where he worked on GaAs monolithic millimetre-wave integrated circuits for use in phased-array radar. He moved to University College London in 1986, where he is now Professor of Opto-electronics and Head of the Department of Electronic and Electrical Engineering. He has published over 400 papers on microwave and opto-electronic devices and their systems applications. His current research interests include III-V semiconductor devices, optical frequency synthesis, broadband wireless over fiber access systems, coherent optical networks, THz photonics and non-linear optical devices.
Professor Seeds has been elected a Fellow of the Royal Academy of Engineering (UK) and an IEEE Fellow (USA). He is a former Member of the Board of Governors and currently Vice-President for Technical Affairs of the IEEE Photonics Society (USA). He has served on the programme committees for many international conferences. He is a co-founder of Zinwave, a manufacturer of wireless over fibre systems and founder of PhronTera, a manufacturer of ultra-fast photonic devices and systems.

Name: Nilay Shah	Institution: Imperial College
e-mail: n.shah@imperial.ac.uk	Dept: Chem/Eng - Process Systems

Please give a brief summary of your background and interests:

Process systems engineering - I am the Director of the Centre for Process Systems Engineering, previously an EPSRC-funded IRC. We undertake research in a wide variety of systems engineering related areas including: modelling, optimisation and control, energy systems engineering, biomedical systems, molecular systems and integrated product and process design.

Name: Dr Carys Siemieniuch	Institution: Loughborough University
e-mail: c.e.siemieniuch@lboro.ac.uk	Dept: Dept EEE/Systems Division

Please give a brief summary of your background and interests:

I am a Senior Lecturer in Systems Engineering in the Dept of Electronic and Electrical Engineering within the Systems Division. A member of INCOSE I have worked as a systems ergonomist for 24 years in the manufacturing, automotive and aerospace domains. In addition as a member of the Institute of Ergonomics and Human Factors (on the Professional Register) and with European CREE registration, I also have expertise across the full range of systems-related human factors topics. As a PI/CoI on a range of EPSRC (8), EU (6) & MoD/Industry (7) funded projects, I have developed new understandings about: the management, capture and utilisation of tacit knowledge; allocation of function and systems design; impact of cultural factors on system autonomy levels; enterprise systems modelling; organisational systems architectures; human and organisational performance measurement; and emergent system behaviours in both the military and civilian domains. I have extensive and varied consultancy expertise, turning my applied research into practical advice for a number of organisations including the European Parliament, the Ministry of Defence and a range of engineering organisations in the UK and Europe.

Name: (Mr) Hillary G Sillitto	Institution: Thales UK
e-mail: hillary.g.sillitto@uk.thalesgroup.com	Dept: Systems Engineering

Please give a brief summary of your background and interests:

Current role: Thales UK systems engineering director, and Thales UK member of the Thales Group Systems Technical Board. Also Visiting professor at University of Bristol Systems Department, lecturing on Sustainable Systems and systems architecting. Chartered Engineer and Fellow of the Institute of Physics. President of INCOSE UK Chapter 2004-6. Elected INCOSE Fellow 2009, (there are about 60 living worldwide) certified as Expert Systems Engineering Professional Feb 2010 (the first in the UK, there are about 30 worldwide). Lead author of the INCOSE UK SEASON report, cited in the calling notice for the meeting. One of three international INCOSE authors on the BKCASE international project to develop a new Systems Engineering Body of Knowledge. Experienced in systems engineering from system of systems level to high-tech products. Member of EPSRC funded LSCITS Research Programme National Stakeholder Board. Passionate about applying fundamental principles of systems to improving the way we do systems engineering across multiple engineering domains and adding value to wider society through a systems approach.

Name: Janet Smart	**Institution: University of Oxford**
e-mail: janet.smart@sbs.ox.ac.uk	**Dept: Saïd Business School**

Please give a brief summary of your background and interests:

I teach a module on Systems Engineering as part of the MSc in Major Programme Management at Saïd Business School. My background is in engineering, and before joining SBS, I had led a group in Manufacturing Systems in the Department of Engineering Science at Oxford University, where we developed methods to measure the structural and dynamic complexity of manufacturing systems. I helped set up the Cabdyn research cluster in 2002, on the measurement and modelling of complex networks, especially supply networks.

My current interests are in the design, delivery and management of large, complex systems. My current research project is analysing the project management methods in large science projects, such as ATLAS and CERN. This is leading to work on identifying emergent systems, and investigating culture and leadership in large, technical, multi-national projects.

Name: Stefan Thor Smith	**Institution: De Montfort University**
e-mail: stsmith@dmu.ac.uk	**Dept: Institute of Energy and Sustainable Development**

Please give a brief summary of your background and interests:

I have a background in Physics, computer modelling and a PhD that utilised stochastic modelling techniques for assessing energy loads in the non-domestic building stock. The past two years I have been a Research Fellow on one of the Adaptation and Resilience to a Changing Climate (ARCC) projects that has been looking at the use of probabilistic climate data for energy modelling of buildings. My research interests have developed in the discipline of applied climatology in the context of impact, mitigation and adaptation. More broadly, this regards human system-earth system interactions; the nature of potentially non-linear interactions that are generally not considered in mitigation and adaptation planning and research.

Name: Tristan Smith	**Institution: UCL**
e-mail: tristan.smith@ucl.ac.uk	**Dept: Energy Institute**

Please give a brief summary of your background and interests:

I have a first degree in general engineering (MEng MA CANTAB), and an MSc and PhD in Naval Architecture. I am a Research Associate in the UCL Energy Institute, prior to which I worked in a design/research role in the UK MoD DE&S, involved in UK warship and submarine design and upkeep. I am currently leading an RCUK energy project Low Carbon Shipping - A Systems Approach, which is a multidisciplinary project applying engineering, economics, logistics, policy to understand the scope for decarbonisation of the global shipping industry. As well as leading the academic/industry/govt/ngo consortium, my research role on this project focuses on modelling the technical and economic interactions in the design and operation of commercial shipping and integrating research outputs produced by the project's members. I am also involved in marine renewables research, recently submitting an EPSRC proposal on modelling the temporal and spatial patterns of energy supply and demand.

Name: Dr. Danielle Soban	**Institution: Queen's University Belfast**
e-mail: d.soban@qub.ac.uk	**Dept: Mechanical and Aerospace Eng.**

Please give a brief summary of your background and interests:

Until recently, I was a Research Engineer with the Aerospace Systems Design Laboratory (ASDL) at the Georgia Institute of Technology in the United States. At the beginning of this year (2010) I accepted a Lecturer position at Queen's University Belfast in the School of Aerospace and Mechanical Engineering. My research areas of expertise and interest are

* Visual Analytics methodology development as applied to complex systems design and analysis.
* Energy Based Design methods for complex systems, particularly aerospace and transportation systems.
* Value Driven Design methods for total lifecycle and beyond analysis and evaluation.
* System of Systems frameworks and analysis methodologies, with specific emphasis on technology infusion, optimisation, and robust design.

Combining my system level expertise with the disciplinary/manufacturing expertise of my QUB colleagues enables innovative new system design and analysis methods.

Name: Prof. Nigel G Stocks	**Institution: University of Warwick**
e-mail: n.g.stocks@warwick.ac.uk	**Dept: Engineering**

Please give a brief summary of your background and interests:

My background is in stochastic nonlinear systems modelling applied to a wide variety situations. Most notable (for this expression of interest) is; novel sensor systems, signal coding and processing and, in particular, robust and reliable methods of coding and processing information with unreliable and components. I am particularly interested in biomimetic approaches (e.g. neural systems and gene networks) to robust and reliable system design in the context of emergent nano-technologies.

More specifically, the emergence of novel nanoelectronic technologies promises to advance the speed of computing, reduce further the size of systems and also reduce power. However, if such systems are to be ever realised in practice a step change in systems engineering is required because emergent nano-electonic devices are predicted to be orders of magnitude less reliable than their CMOS counterparts. Consequently, novel fault tolerant systems will be necessary. I am interested in investigating system architectures that could provide suitable solutions. I believe the study of biological systems (e.g. neural and gene) provide a way forward.

Name: Adrian Terry	**Institution: Advanced Problem-Solving Partnership Ltd**
e-mail: adrian@achievementadvance.com	**Dept:**

Please give a brief summary of your background and interests:

I have been in industry at the forefront of performance improvement and change in the engineering sector for nearly 20 years, recently establishing a small social enterprise practice servicing organisations in solving complex problems.

A systemic thinker by nature and professionally qualified as an L&D/OD specialist and mediator I straddle the people / task and academic / industrial divides. A visiting fellow at Bristol Systems Centre, University of Bristol and a member of INCOSE, I lead on creativity, innovation and change in problem-solving. More recently I have been asked to expand this into a fuller programme of transferable skills supporting systems EngDs in their industrial roles.

I am interested in the frameworks, processes and tools to navigate the problem space, handle complexity and the skills to enhance collaboration releasing synergy with non-systems colleagues. These are essential to releasing value from systems engineering but remain under explored obstacles.

Name: Prof. Philip Thomas	Institution: City University, London
e-mail: pjt3.michaelmas@gmail.com	Dept: School of Engineering and Mathematical Sciences

Please give a brief summary of your background and interests:

Strong interest in systems engineering across the patch, from chemical, oil, rail transport to nuclear industry.

Specialisms: 1. dynamic simulation of industrial processes (standard textbook written); 2. risk analysis and management, particularly the new J-value technique applied to risk analysis. The J-value framework tells management when it is reasonable to STOP spending when faced with risks to humans and the environment.

Current research contracts with EPSRC/ESRC - SPRIng multi-university project to assess the sustainability of nuclear power in the UK (Manchester, City and Southampton); with EDF on new nuclear build; with First Group on assessing risks in rail and road transport.

Name: Professor Antonios TSOURDOS	Institution: Cranfield University
e-mail: a.tsourdos@cranfield.ac.uk	Dept: Informatics and Systems Engineering

Please give a brief summary of your background and interests:

Professor Antonios Tsourdos research interests include guidance, control and navigation of unmanned autonomous vehicles, multiple vehicle reasoning, open system architecture for vehicle health management, cooperative control systems and system verification.

Antonios was member of the Team Stellar, the winning team for the UK MoD Grand Challenge (2008) and the IET Innovation Award (Category team, 2009). He is co-author of the article “Unmanned aerial vehicle navigation and mapping”, published in Vol. 222, issue G4 and won the 2008 PE Publishing Best Paper Award. He is also co-author of the book “Cooperative Path Planning of Unmanned Aerial Vehicles”. Antonios is an editorial board member of the Proceedings of the IMechE Part G - Journal of Aerospace Engineering, the International Journal of Systems Science, the IEEE Transactions of Instrumentation and Measurement, the International Journal On Advances in Intelligent Systems and the International Journal Mathematics in Engineering, Science and Aerospace. He is member of the A|D|S Autonomous Systems Strategy Group and the A&D KTN National Technical Committee on Autonomous Systems. Professor Tsourdos is member of the IFAC Technical Committee on Aerospace Control, the IFAC Technical Committee on Networked Systems, the AIAA Technical Committee on Guidance, Control & Navigation, the IEEE Control System Society Technical Committee on Aerospace Control, the IEEE Control System Society Technical Committee on Intelligent Systems and Control and the IEEE Technical Committee on Aerial Robotics and Unmanned Aerial Vehicles

Name: Ravi Vaidyanathan	**Institution: University of Bristol**
e-mail: r.vaidyanathan@bristol.ac.uk	**Dept: Mechanical Engineering**

Please give a brief summary of your background and interests:

My research centers on hierarchical systems, with emphasis on mechanisms of sensory-motor control, specifically with respect to systems-level coupling between mechanics and neurophysiology. The core hypothesis is the idea that complex behavior emerges from the interaction of a system with its environment; interactions among a breadth of subsystems must be tuned and adapted to achieve this objective. Analysis of said systems demands the development of new mathematical and control paradigms, new implementations of performance based architecting, heuristic optimization, and analysis techniques. Architecting on such a scale demands properly synergizing a range of subsystems consisting of chemical, electrical, mechanical, communications, software, psychological, humanistic, and a myriad of other elements. Mechanisms governing the pervasive adaptation between these subsystems can lend critical insights to fulfillment of evolving sets of requirements to meet stakeholder needs. My current work involves using a combination of genetic algorithms, fuzzy logic, advanced pattern recognition algorithms, and emergent programming techniques in this realm.

Name: Graham Wallis	**Institution: MBDA Ltd**
e-mail: Graham.wallis@mbda.co.uk	**Dept: Future Systems**

Please give a brief summary of your background and interests:

Dr Graham Wallis is Chief Technologist in MBDA Missile Systems Ltd, the European defence company. In the 90's he was the Chief System Engineer for the UK's first cruise missile, Storm Shadow. He now manages the Systems side of the first Anglo-French government funded R&D partnership, which is based heavily on the UK Defence Technology Centre model. His activities also include Open Innovation and technology networks, and in general championing new technologies within the company.
Over the last three years He has built up links with university research teams in Manchester, Lancaster, Leicester, Cranfield, Liverpool, Bristol, De Montfort, Cambridge (IfM)
For the last three years he has been External Examiner to the MSc Course on Guided Weapons Systems Engineering at Cranfield (Shrivenham).

Name: Meihong Wang	**Institution: Cranfield University**
e-mail: meihong.wang@cranfield.ac.uk	**Dept: School of Engineering**

Please give a brief summary of your background and interests:

My research interest includes:

- Modelling, Simulation, Optimisation and Control of chemical Processes such as CO_2 Capture process and power plants
- Modelling, Simulation, Opimisation and Control of Energy Systems
- Process System Identificatio and Monitoring

In other words, this is Porcess Systems Engineering

Name: Robert Ian Whitfield	**Institution: University of Strathclyde**
e-mail: ian.whitfield@strath.ac.uk	**Dept: Design Manufacture and Engineering Management**

Please give a brief summary of your background and interests:

Robert Ian Whitfield is a lecturer in the department of Design Manufacture and Engineering Management at the University of Strathclyde. He has been involved in the management and conducting of research within a number of large FP5 and FP6 integrated projects within the shipbuilding industry and has garnered significant knowledge in how to achieve and support collaboration between a large number of partners for successful project completion. These projects have each focussed on the development of integrated systems for the support for collaborative and distributed design across Europe. He was recently involved with leading the research in a joint BAE Systems - EPSRC that developed techniques for supporting collaborative decision making within a network-enabled organisation. His research background covers issues relating to: collaboration, design co-ordination, integration, modular design, process modelling and optimisation, product data management, resource management, and systems engineering.

Name: Dr Jennifer Wilby	**Institution: University of Hull**
e-mail: j.wilby@hull.ac.uk	**Dept: Business School**

Please give a brief summary of your background and interests:

I have a PhD in Management Systems (Hull), an MSc in Cybernetic Systems (San Jose State University, CA) and an MPH in Public Health (Nuffield, Leeds). I am a lecturer in Management Systems at the University of Hull (for the past seven years), and immediate past Director of the Centre for Systems Studies at the University of Hull. Prior to joining Hull, I worked for five years as a systematic reviewer at the University of York, Centre for Reviews and Dissemination, producing rapid reviews for the National Institute for Clinical Excellence (NICE). I am currently President of the International Society for the Systems Sciences, a premier professional society for the study of research and practice in all areas of systems: including control systems, complexity theory, systems engineering, cybernetics, and many various systems methodologies. In this role, I am working closely with INCOSE on furthering links between ISSS and INCOSE, within the working groups of systems science and complexity theory, exploring the use of qualitative inputs to systems engineering design and practice. My other interests lie in international health policy making for the monitoring and control of (re)-emerging infectious disease.

Name: Phil Williams	**Institution: ESP KTN**
e-mail: phil.williams@espktn.org	**Dept:**

Please give a brief summary of your background and interests:

I have studied in the fields of Physics, Satelite Engineering and Intelligent Systems. I have worked as a software engineer and systems engineer in the fields of Space Science, Telecomunications and Automotive Engineering.

I currently work for the Electronics, Sensors, Photonics Knowledge Transfer Network and one of the areas that we are particularly interested in is Systems Engineering.

I am also Project Manager for HELIO, an FP7 funded project tasked with building a Virtual Solar Observatory to support the science community in the relatively new field of Heliophysics.

My key areas of interest are in the fields of intelligent systems, autonomous systems and knowledge transfer

Name: Sir Alan Wilson FBA FRS	**Institution: University College London**
e-mail: a.g.wilson@ucl.ac.uk	**Dept: Centre for Advanced Spatial Analysis**

Please give a brief summary of your background and interests:

I am Professor of Urban and Regional Systems and my main academic interests involve mathematical and computer modelling of systems ranging in scale from cities to the global. I am particularly interested in the mathematics of the evolution of cities and in the global case, modelling trade and migration flows in the context of economic development, development aid and security.

I have EPSRC grants on modelling at both scales, most recently a 5 year £2.5M award on global dynamics as part of the 'New tools for complexity science applied to real world problems' call.

Name: Alex Yakovlev	**Institution: Newcastle University**
e-mail: alex.yakovlev@ncl.ac.uk	**Dept: EECE**

Please give a brief summary of your background and interests:

Professor of Computing Systems Design. Head of Research Group "Microelectronic Systems Design" at Newcastle. M.Sc. and Ph.D. from the St. Petersburg Elec. Eng. Univ. (1982), and D.Sc. from Newcastle University (2006) on theory and practice of using concurrency models for hardware design. Main interests and publications are in the area of digital systems design, low power, power-management, in particular focusing on self-timed VLSI circuits, asynchronous communications, concurrent systems and their formal semantics, Petri nets and interfacing, and multi-processor standards (www.staff.ncl.ac.uk/alex.yakovlev). Published four monographs and more than 250 papers in academic journals and conferences, has managed over 25 research contracts. Most recent interests lie in the area of resource-driven and energy-aware computing, use of game-theory in systems engineering, ways of designing electronic systems to work from energy-harvester sources, power-management in computing systems, designing systems robust to process and environmental variations, on-chip communications and networks on chip, electronic system design for healthcare applications.

Name: Kate Young	**Institution: Halcrow**
e-mail: youngk@halcrow.com	**Dept: Technology Management**

Please give a brief summary of your background and interests:

I am currently Technology Manager at Halcrow with prime responsibilities over the central research projects and coordination of our strategic links with Universities, such as our Engineering Doctorate and Industrial CASE PhD studentships.

I have a background in system supportability for the defence sector and am working with HM Treasury's Infrastructure UK (IUK) under the Engineering and Interdependency Expert Group (EIEG).

A key objective for IUK and the EIEG particularly is to ensure that infrastructure is considered as a 'network of networks' and that interdependencies are properly understood and managed. To meet their objectives, the EIEG is currently undertaking an assessment of the critical systemic risks and innovative opportunities in UK infrastructure, to enable the proposal of a forward programme of work to mitigate the risks and deliver the opportunities.

Name: Professor Qing-Chang Zhong	**Institution: Loughborough University**
e-mail: Q.Zhong@lboro.ac.uk	**Dept: Aeronautical and Automotive Eng.**

Please give a brief summary of your background and interests:

Leading a research group of 8 academics, Professor Zhong is a Chair in the Dept of Aeronautical and Automotive Eng. at Loughborough Univ., which is one of the 12 EPSRC Framework Universities and currently holds £100M funding from EPSRC. He is leading the EPSRC-funded New-ACE Network with 160+ members. Professor Zhong was educated as a systems engineer and specialises in control theory and its applications in chemical, electrical and electronic, aeronautical and automotive systems. His profound understanding in systems theory has enabled him to make significant contributions towards systems and control theory, power electronics and renewable energy, which are enabling technologies to address many energy-related issues. He authored three research monographs in these areas. He strongly believes that a holistic approach should be taken to address any problems we face today. His research has been focusing on identifying fundamental problems behind the scene and proposing elegant solutions. He has established links between many fundamental concepts in systems and control. He values the impact of research and works closely with several companies to transfer the technologies he developed.