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UNSW
A U S T R A L I A

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Emerging Disruptive Technologies Assessment Symposium

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Speaker Biographies

	Page
<u>Prof Les Field, Vice-President & Deputy Vice-Chancellor (Research) (UNSW Australia)</u>	2
<u>Dr Alex Zelinsky, Chief Defence Scientist (DSTO)</u>	2
<u>Dr Paul Rogers (US Army TARDEC, USA)</u>	3
<u>Prof Maurice Pagnucco (UNSW Australia)</u>	4
<u>Dr Steve Brodie (UNSW Australia)</u>	4
<u>Mr Mike Conroy (NASA, USA)</u>	4
<u>Dr Todd Mansell (DSTO)</u>	5
<u>Mr Corey Cook (Lockheed Martin)</u>	5
<u>Prof Hussein Abbass (UNSW Australia)</u>	6
<u>Dr Foster Langbein (Risk Frontiers)</u>	7
<u>Dr Brian Mekdeci (University of SA)</u>	7
<u>Mr Andrew Balmaks (Noetic Group)</u>	7

09:10 UNSW Australia Welcoming**Prof Les Field, Vice-President & Deputy Vice-Chancellor (Research) (UNSW Australia)**

Professor Les Field is Vice-President and Deputy Vice-Chancellor (Research) at UNSW Australia in Sydney, Australia.

Professor Field is responsible for the strategic research direction and overall research performance of the University, and in particular, maintaining and advancing the University's profile in research and research training, as well as in technology transfer.

Professor Field is a graduate of the University of Sydney (PhD in Chemistry in 1979) and, following Postdoctoral Fellowships at the University of Southern California in Los Angeles and at Oxford, he took up an academic post at the University of Sydney in 1982. He was awarded a DSc by the University of Sydney in 1991. At the University of Sydney, Professor Field was Professor of Organic Chemistry (1990-2005); he was Head of the School of Chemistry (1997-2001); Associate Dean for Research in the Faculty of Science (1998-2001); and Acting Deputy Vice-Chancellor (Research) (2001-2003). He took up his current post at UNSW in 2005.

His main areas of research are organometallic chemistry, catalysis and NMR spectroscopy. He is the author of more than 200 scientific papers and 7 text books. He was the recipient of the Organic Chemistry Medal of the Royal Australian Chemical Institute in 1994 and was elected as a Fellow of the Australian Academy of Science in 1996. He has served as a member of the Council of the Australian Academy of Science (2004-2006) and he is currently a member of the Academy Executive as the Secretary for Science Policy. He is a Fellow of the Royal Society of NSW and he has served on the Council of the Royal Australian Chemical Institute (2004-2008). He was appointed as Member of the Order of Australia in 2011 for his services to Chemistry and to Higher Education.

Academic Awards include: The Rennie Medal (1983); The Edgeworth David Medal (1986); The Organic Chemistry Medal (1992); the Centenary of Federation Medal in 2003; and the Leighton Medal of the Royal Australian Chemical Institute in 2010.

Professor Field is a director of the Victor Chang Cardiac Research Institute Pty Ltd; Australian Technology Park Innovations Pty Ltd; Uniseed Management Pty Ltd and Uniseed UITT Pty Ltd. He is also Chairman of UNSW Innovations Pty Ltd which is the technology transfer company for UNSW, responsible for industry engagement, managing the University's patent portfolio and for dissemination of research done at UNSW into industry and the wider community.

09:20 Welcome and Symposium Official Opening**Dr Alex Zelinsky, Chief Defence Scientist (DSTO)**

Dr Alex Zelinsky was appointed Chief Defence Scientist and head of the Defence Science and Technology Organisation (DSTO) in March 2012. Before joining DSTO he was Group Executive for Information Sciences at the commonwealth Scientific and Industrial Research Organisation (CSIRO) and Director of CSIRO's Information and Communication Technologies Centre.

Dr Zelinsky was Chief Executive Officer and co-founder of Seeing Machines, a high-technology company developing computer vision systems. The company is listed on the London Stock Exchange and was a start-up from the Australian National University in Canberra, Australia, where Dr Zelinsky was Professor of Systems Engineering.

Dr Zelinsky researched in robotics and computer vision at the AIST Electrotechnical Laboratory in Japan and has taught and conducted research in computer science at the University of Wollongong, New South Wales, Australia. He started his career as a Systems Engineer with BHP Steel International.

Dr Zelinsky has extensively advised Federal and State governments in Australia, including as a member of the Australian Government's Defence Industry Innovation Board. He has served on the advisory panels to the Australian Research Centre (ARC) Centre for Vision Science and the ARC Centre of Excellence for Autonomous Systems.

Dr Zelinsky completed his Bachelor of Mathematical Sciences (Honours) and Doctor of Philosophy at the University of Wollongong, NSW.

In 2009, Engineers Australia named Dr Zelinsky Professional Engineer of the Year (Sydney Division) and he has been listed in Engineers Australia's top 100 most influential engineers since that year. In 2013 he was awarded the prestigious Pearcey Medal, the ICT industry's premier prize for lifetime achievement. In August 2015 he will be presented with the MA Sargent Medal, a long established and prestigious award in the Engineering sector, for his significant contributions to engineering science, including technical innovation and leadership.

09:40 Plenary - Future Ground Vehicle Robotics

Dr Paul Rogers (US Army TARDEC, USA)

Dr. Paul D. Rogers is Director of the U.S. Army Tank Automotive Research Development and Engineering Center at Detroit Arsenal, Michigan. He is responsible for providing executive management to deliver advanced technology solutions for all Department of Defense ground systems and combat support equipment. Dr. Rogers was selected to the Army Senior Executive Service in 2007.

As the TARDEC Director, Dr. Rogers manages a workforce of more than 1,700 engineers, scientists, researchers, and support staff and sets strategic direction for a full range of investments that affect more than 270 Army systems. With an annual budget of more than \$475 million, Dr. Rogers ensures TARDEC provides vigilance and resourcefulness to deliver solutions within cost and on schedule.

Dr. Rogers previously served as the Deputy Program Executive Officer for Ground Combat Systems, which has an annual budget of \$2.9. Prior to this role, Dr. Rogers served as the TARDEC Executive Director for Research and Technical Integration. In this capacity, Dr. Rogers led the organisation in providing Army research and development in Ground Vehicle Power and Mobility, Survivability, Intelligent Systems, Vehicle Electronics and Architecture Systems, and Platform Concept, Analysis, and System Simulation.

As a member of the Michigan National Guard, Dr. Rogers Dr. Rogers military awards and decorations include the Bronze Star, Army Meritorious Service Medal, Army Achievement Medal, Iraqi Campaign Medal, Airborne Badge and the Bronze Order of the de Fleury Medal

Dr. Rogers holds a Ph.D. in Mechanical Engineering--Engineering Mechanics from Michigan Technological University (MTU), a Master of Strategic Studies from the U.S. Army War College, a Master of Science in Engineering--Mechanical Engineering from the University of Michigan -- Dearborn, and a Bachelor of Science in Mechanical Engineering from MTU. He is a graduate of the Army Engineer Officer Basic Course, Engineer Officer Advance Course, Combined Arms Services Staff School, Army Command and General Staff College and the U.S. Army War College. Dr. Rogers has previously served on the External Advisory Boards for the Mechanical Engineering Departments at Michigan Technological University, Lawrence Technological University and the University of Michigan. He has also previously served as an Adjunct Professor of Mechanical Engineering at LTU.

10:10 UNSW Robotics & Automation

Prof Maurice Pagnucco (UNSW Australia)

Maurice Pagnucco is a Professor and Head of the School of Computer Science and Engineering at the University of New South Wales in Sydney, Australia. His main research interests are in artificial intelligence. In particular, the fields of cognitive robotics, reasoning about action, belief change, abductive inference and nonmonotonic logics. Maurice graduated with a BSc and PhD from the University of Sydney. He has held academic positions at the University of Sydney, Macquarie University, the University of Toronto and the University of New South Wales.

11:10 Innovation Keynote - Break Through Innovation

Dr Steve Brodie (UNSW Australia)

Dr Steve Brodie, is the Open Innovation Manager at UNSW Innovations. Steve is a Materials Scientist and Engineer with research and development experience in large and small companies across Europe and Australia. He is passionate about creativity and innovation and for the past 15 years has used these skills within a university context. He is particularly keen to help young entrepreneurs and intrapreneurs develop the creative thinking and innovation skills they need to accelerate their careers. Steve is currently the Open Innovation Manager at UNSW Innovations, helping drive collaborative innovation partnerships between UNSW and society.

11:30 Innovation Keynote - Playing Nice Across Time and Space

Mr Mike Conroy (NASA, USA)

Mr Mike Conroy is the Modeling, Simulation, IT Technology Manager at the Kennedy Space Center and is now leading Kennedy M&S and IT Research management while building simulators and game based tools for NASA Exploration efforts.

His experience ranges from Expendable Launch Vehicles, Space Shuttle, a multi-year sentence in financial management, computer networks and data systems, engineering environments, contracts, group management and Modeling and Simulation for the Constellation Program.

13:40 Opportunities for Trusted Autonomy for HADR**Dr Todd Mansell (DSTO)**

Dr Mansell leads the Joint and Operations Analysis Division (JOAD) in DSTO. JOAD undertakes scientific analysis and develops command and control support tools that supports defence decision makers across the entire capability life cycle. The division achieves this through the application of scientific methods including operations research, operations analysis, simulation assisted experimentation, cognitive science, experimental psychology, artificial intelligence and systems engineering.

Dr Mansell is also the Domain Program Leader for Vice Chief of the Defence Force Group, Joint Operations Command, and Strategy Executive; as well as being an Adjunct Professor with the University of South Australia (Defence and Systems Institute). Dr Mansell joined the Defence Science and Technology Organisation (DSTO) in Melbourne as a Cadet Research Scientist in 1988 after completing a BSc degree in Physics and Electronics with first class Honours from Deakin University.

Over his career, Dr Mansell has had numerous overseas postings including a 15-month posting with Canada's Defence Research Establishment Atlantic (1996/7), the Naval Undersea Warfare Centre, Rhode Island (1997), and the Counsellor on Defence Science (CONDS) based in the Australian High Commission, London (April 2004 to Jan 2007) – where he was responsible for DSTO's Science and Technology links with the UK and continental Europe. As CONDS London, Dr Mansell focused on counter terrorism research, defence R&D business models, quantifying impact of research investment, systems engineering and Unmanned Combat Autonomous Vehicles.

14:10 Autonomous Systems for Humanitarian Assistance and Disaster Response**Mr Corey Cook (Lockheed Martin)**

Corey Cook is the Senior Program Manager and Chief Technologist for Logistics and Sustainment, Corporate Engineering, Technology, and Operations, Lockheed Martin Corporation. Located at Lockheed's premier technology Center for Innovation in Suffolk, Virginia, he is responsible for logistics and sustainment strategic planning; technology innovation, integration, and development; and cross-corporate business initiatives. Mr. Cook's programs include DoD Joint Force Operations, Global Supply Chain, Autonomous Systems, Radio Frequency Identification and Automated Identification Technologies, Additive Manufacturing, Hybrid Air operations and associated corporate strategic partnerships. He also serves as the Disaster Response Integrative Logistics Director focused on technological advancement to support humanitarian and disaster response operations.

Prior to his tenure at Lockheed Martin, Corey served more than 20 years as an Electrical Engineer and Naval Supply Corps Officer serving on numerous overseas deployments followed by a two year special assignment with the Army Military Transportation Management Command where he served as the naval liaison and action officer for South American and Pacific Operations. Mr. Cook concluded his service as the Director of the Navy Expeditionary Medical Support Command responsible for humanitarian assistance and disaster and wartime medical readiness response. In that capacity, he oversaw the activation, deployment, administration, and logistics sustainment of

eight pre-positioned 500 bed hospitals worldwide, sixteen Expeditionary Medical Facilities, and numerous Forward Deployable Preventative Medical Units for disease and contagion detection.

Corey Cook received a Bachelor of Science degree in Business Administration from Christopher Newport University in Virginia, and an M.B. A. in Project Management and Masters Degree in Program Management from the Florida Institute of Technology. He is a native of Texas and currently resides in Newport News, VA., married to the former Gabriela Pena, with one daughter, Caily.

14:30 On Trust in Humans and Machines

Prof Hussein Abbass (UNSW Australia)

Hussein Abbass is a Full Professor at the School of Engineering and Information Technology, University of New South Wales, Canberra, Australia. In 2015, he was awarded a High-End Foreign Expert fellowship in the Talent1000 Program at Xidian University, Xi'an, China. In 2005, he spent a six-month sabbatical at the University of Illinois, Urbana-Champaign, USA and in 2014 he spent a one-year sabbatical at the National University of Singapore. He was a John-Yu Fellow at Imperial College London in 2003. Prof. Abbass is a member of the Australian Research Council College in the Engineering, Mathematics, and Information Cluster since 2013. In 2010, he was a Research Evaluation Committee member of the Australian Research Council, Mathematics, Information and Communication, Excellence of Research Australia. In 2008 he was an Expert Sub-committee Member of the National Collaborative Research infrastructure strategy (NCRIS) expert sub-committee on Safeguarding Australia. Prof. Abbass is a Fellow of the Australian Computer Society, a Fellow of the Operations Research Society (ORS, UK), and is a Senior Member of the IEEE. He is the founder of the IEEE-CIS Canberra Chapter and is currently the President of the Canberra Chapter of the Australian Operations Research Society. He is an Associate Editor of IEEE Transactions on Evolutionary Computation, the IEEE Computational Intelligence Magazine, and four other journals. He has 200+ refereed publications, an h-index of 32 and close to 5000 citations (Scholar.Google).

Prof. Abbass pioneered work on Pareto-based Neural Networks, Pareto-based Ensemble Learning, and Evolutionary Multi-objective Optimisation. He applied Computational Intelligence Techniques to a variety of applications including his extensive work on Air Traffic Management. His current research is focusing on designing game theoretic models of Trust, Human-Machine Intelligent and Cooperative Systems, Optimisation under Conflicting Objectives and Sever Uncertainty, and Evolutionary Machine Learning. His latest book was published by Springer, appeared in December 2014 and entitled "Computational Red Teaming: Risk Analytics of Big-Data-to-Decisions Intelligent Systems".

15:20 A solar superstorm - what if?**Dr Foster Langbein (Risk Frontiers)**

Dr Foster Langbein is Risk Frontiers' Chief Technology Officer and Software Architect. He has a PhD in High Energy Physics from the University of Durham, United Kingdom where he was modelling thermodynamic processes in the early universe and has 15 years experience as a software engineer in the games and animation industry.

Foster is primarily concerned with integrating Risk Frontier's loss models into software for use by the industry at large and is currently engaged in the ongoing development of Risk Frontier's Multi-Peril Workbench. Foster also looks after Risk Frontier's IT infrastructure and future technology directions.

15:40 Calibrated trust and what makes a trusted autonomous system**Dr Brian Mekdeci (University of SA)**

Dr. Brian Mekdeci is currently a Research Fellow at the Defence and Systems Institute, UNISA. He received a B.A.Sc. and M.A.Sc. in Systems Design Engineering from the University of Waterloo in Canada, and an Engineering Systems Ph.D. from M.I.T. in the United States. His research interests include critical systems, unmanned vehicles, trusted autonomy, simulation and modelling, serious gaming, and human factors.

16:00 Workshop Overview**Mr Andrew Balmaks (Noetic Group)**

Andrew is a co-founder and the Chairman of the Noetic Group. His primary responsibility is driving the growth of the Group and leading projects of strategic significance. Andrew typically works with, and advises senior executives in relation to their key organisational challenges. He has built a strong reputation for dealing with difficult and sensitive issues, demonstrating an ability to 'unpack' these issues and develop 'de-sensitised' and implementable options to address them. Consequently, Andrew has earned the trust of senior executives which allows him to 'tell it like it is'.

Andrew is a highly effective leader, manager and strategic thinker with over 30 years' experience in the public and private sectors, both in Australia and overseas. He has significant experience in strategic thinking and analysis based around a consideration of alternate futures and the need for innovation. His work has strongly influenced the direction and development for a range of organisations. He is an excellent facilitator and is regarded as a lateral thinker with a proven ability to deal with complex, difficult and often sensitive problems.

Andrew has very strong written and oral communications skills. He has authored a number of major pieces of work and speaks at conferences and workshops on a regular basis. He has twice been a Visiting Fellow with the University of New South Wales.