SIMULATION, IMMERSIVE ENVIRONMENTS AND HUMAN INTERACTIONS
Simulation Conference
LAND FORCES 2018

Simulation, VR/AR, immersive environments, human, robotic and AI interactions are rapidly converging in the defence domain. With the technology and its use progressing at an exponential rate, errors could be made by overriding the human considerations and not selecting the best modality to achieve the desired training or mission outcome.

DAY ONE - Tuesday 4 September 2018

0930 - 1020	**WORKSHOP - *Human Factors in Simulation and Training: Considerations for Managers***
	Room L1, Adelaide Convention Centre With the increasing adoption of immersive technologies and environments such as virtual reality (VR), augmented reality (AR) and mixed reality (MR), the risk and impact of these modalities on the human, such as cybersickness, is yet to be fully understood. Dr McGrath is a specialist in the field of human factors and will give an overview of considerations for managers and implementation for use of these technologies. ***Dr Braden McGrath*** Distinguished Visiting Professor, College of Arts and Sciences, Department of Department of Human Factors, Embry-Riddle Aeronautical University, and Research Engineer and Adjunct Professor, Faculty of Education, Science, Technology and Mathematics, University of Canberra
1020 - 1050	**PRESENTATION - *On the Frontier of Virtual Training: An Overview of Future Technologies and their Implications for Training, Assessment and Research***
	Room L1, Adelaide Convention Centre With growing accessibility to commercial virtual, augmented and mixed-reality platforms the role of immersive training and assessment has broadened to include a range of applications across many industries. This session will present a range of new technology platforms and their applications in VR-based training, from artificial intelligence to biometric feedback, as well as cover some of the questions being raised to professionals as the technology moves into new frontiers. ***Emre Can Deniz*** Director, Opaque Space
1050 - 1100	*Break*
1100 - 1130	**RESEARCH - Free-Roam VR Technology for Tactical Training: Physiological Arousal Effects**
	Room L1, Adelaide Convention Centre This session shares the first trial of a free-roam virtual reality (FRVR) technology for military training. Soldiers performed a VR-simulated room clearance task. Immersion in combat-based FRVR caused robust increases in heart and respiratory rates. Thus, FRVR technology is capable of provoking significant stress response comparable with existing combat training modalities. ***A/Prof Eugene Nalivaiko*** School of Biomedical Sciences and Pharmacy, University of Newcastle ***Major Dan Harrison*** Staff Officer Training Support Systems, Land Simulation Program: Land Capability Division, Army Headquarters
1130 - 1200	**RESEARCH - Case Study in the Use of Live and Virtual Simulation for Experimentation**
	Room L1, Adelaide Convention Centre Dr Fidock will offer an overview on the recent international joint forces CUE 17 exercise and discuss the role of live and virtual simulation in the contested urban environment challenge held in Adelaide in November 2017. ***Dr Justin Fidock*** Project Leader Contested Urban Environment Strategic Challenge, Defence Science and Technology Group (DSTG)
1200 - 1330	*Lunch Break*

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DAY ONE - Tuesday 4 September 2018

1330 - 1430

PLENARY - INTERNATIONAL KEYNOTE ADDRESS
Human-Machine Teaming and Implications for Defence Human Performance Improvement and Power Projection Across all Areas of Combat

Rooms L2/L3, Adelaide Convention Centre

LTCOL William D. Casebeer, Ph.D.

Innovation Lab Director, Beyond Conflict International

Dr Casebeer's presentation is in collaboration with the Centre for Creative and Cultural Research, University of Canberra. Dr Casebeer is a career intelligence analyst and Lieutenant Colonel in the US Air Force. He currently is the Senior Research Area Manager in Human Systems and Autonomy for Lockheed Martin Advanced Technology Laboratories. Formerly Dr Casebeer was at DARPA in the Defense Sciences Office and the Biological Technologies Office, where he started the Narrative Networks and Low-Cost EEG programs, and led Accelerated Learning, Education Dominance, Strategic Social Interaction Modules and other programs. His last military command position was as Deputy Director of the Technology Advancement and Warfighter Training Department for the 500-person Joint Warfare Analysis Center (a DoD modeling and simulation unit).

1430 - 1500 *Break*

1500 - 1630

PLENARY PANEL
Train as you Fight: Live Reality Based Training as a Key Enabler to Create the Combat Mindset in Force on Force Training

Rooms L2/L3, Adelaide Convention Centre

The Combat Mindset is a state of mind that prepares soldiers to kill the enemy and survive, then continue the fight. This state of mind offers the optimal paradigm for training Australian soldiers, and promotes the development of resilience and intuitive behaviours to perform in battle. Army training institutions are beginning to harness this Special Forces training philosophy to develop soldiers. This panel discusses reality based training as an enabler to instil the combat/warrior mindset. From the initial planning stage to the exercise using advanced opposing force combat effects, culminating in the reality of battle in hostile environments, the panel will discuss the role and place of reality based training in simulating the ultimate stress of war and the critically, physically interactive exchange between soldier and enemy.

Ken Murray

Master Trainer and Founder, Reality Based Training Association

WO2 Darren Mortimer

ADF Trainer, Department of Defence

LTCOL Grant Chambers

Commanding Officer, Training Task Unit 6, Army

Tad Pride

Director, CombatFX

DAY TWO - Wednesday 5 September 2018

0930 - 1030

PLENARY - INTERNATIONAL KEYNOTE ADDRESS
The Warrior Combat Mindset

Rooms L2/L3, Adelaide Convention Centre

Ken Murray

Master Trainer and Founder, Reality Based Training Association

Ken Murray is among the top trainers in the world when it comes to simulation training. Reality Based Training has gained popularity over the years as agencies strive to improve responses during critical incidents. Reality Based Training is much more complex than many other kinds of training. Murray teaches instructor schools on how to set up and conduct safe and effective simulation training and is considered the leading expert on reality based training. His new book, Training at the Speed of Life-The Definitive Textbook for Police and Military Reality Based Training, is being praised as the "bible for reality based training." Murray frequently writes for PoliceOne.com and is the director of training for the Armiger Police Training Institute.

1030 - 1100 *Break*

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DAY TWO - Wednesday 5 September 2018

1100 - 1200 — **PANEL PRESENTATION - *Beyond Training: Next Generation Technologies and Human Interactions***

Rooms L2/L3, Adelaide Convention Centre

Technological advancements are enabling new relationships with mediums such synthetic agents, avatars, robots – to name a few. Are these mediums contributing to new forms of training and learning? Or are they merely reproducing what already exists in the ‘’theatre of the mind”? This panel of experts will draw on their experience in the field to interrogate the implications of next generation simulation training technologies and human interactions.

LTCOL William D. Casebeer, Ph.D.
Innovation Lab Director, Beyond Conflict International

LTCOL Jason Mildon
Deputy Director Land Simulation, Army Headquarters, Directorate of Land Simulation

Ken Murray
Master Trainer and Founder, Reality Based Training Association

1200 - 1300 — *Lunch Break*

1300 - 1400 — **WORKSHOP - *Scenario Writing***

Room L1, Adelaide Convention Centre

LTCOL Chambers will draw on his extensive experience of training officers to offer insights into the development of immersive and engaging scenarios for training purposes. He will be joined in conversation with Dr Crea a specialist in scenario design for immersive environments.

LTCOL Grant Chambers
Commanding Officer, Training Task Unit 6, Army

Dr Teresa Crea
Development Lead - Simulation, Visualisation & Immersive Technology, University of NSW

1400 - 1430 — **PRESENTATION - *Castor: A COTS Console for Learning***

Room L1, Adelaide Convention Centre

Project Castor is a prototype for a future secure Defence learning platform. It utilises Commercial off the Shelf (COTS) capability via a games console to host an interactive learning environment and creating a platform for training that is more engaging and relevant to today’s personnel at all levels and areas within Defence.

Adrian Webb
Manager of Virtual Worlds, Australian Defence Simulation and Training Centre

1430 - 1450 — *Break*

1450 - 1620 — **PANEL PRESENTATION - *Using Simulation to Train Leadership, Team Communication and Compliance***

Room L1, Adelaide Convention Centre

This session will bring presenters from health, defence and manufacturing to share how different industries use simulation applications and methodologies to train teams or individuals across leadership, team communication and compliance.

Dr David Foley
Adelaide Nursing School, Faculty of Health Sciences, Adelaide Health & Medical Sciences, The University of Adelaide

LTCOL Jason Mildon
Deputy Director Land Simulation, Army Headquarters, Directorate of Land Simulation

Michael Pitt
National Development Manager, Weld Australia

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DAY THREE - Thursday 6 September 2018

0930 - 1600	**DEMONSTRATIONS**
	Exhibition Halls, Adelaide Convention Centre Modelling and simulation demonstrations are scheduled throughout the day to showcase within the LAND FORCES 2018 exhibition halls.
0930-0950	**Nobles - *Simulation Training isn't a New Idea, but VR Technology in the Crane Industry is a Game Changer***
	Nobles Booth - 4N4 Presenter: Malcolm Doyle Simulators have been at the backbone of highly specialised, complex professional training programs for decades. Industries such as Aviation, Law Enforcement, Aerospace, and the Military rely on simulations to expose their team members to dangerous and sometimes life-threatening situations without actually putting them in harms way. With specialized niche industries proving that simulation training is valuable, why hasn't it spread to a larger scale? A number of the shortcoming of legacy simulation training (i.e. Screen-Based) are addressed by the advent of Virtual Reality (VR) Technology and allow for a scalable training simulation solution for industries across the board.
1000-1020	**Opaque Media - AIVA: Training and Learning Management/Records Platform**
	Opaque Media Booth – 5A42 Presenter: James Bonner Opaque has created simulations, visualisation tools and input technologies for a range of industries, including healthcare, military, construction, moviemaking, and spaceflight. On view at our booth will be a range of our training simulations and key demonstrations of how they tie into our flagship training and learning management/records platform, AIVA.
1030-1050	**iSimulate - REALITi**
	APSA Booth – 5A39 Presenter: Brent Carlisle REALITi allows you to deliver extremely effective medical simulation anywhere. In the field, on a ship, in a helicopter, the emergency room. Makes it easier, simpler and more cost-effective to train health professionals.
1100-1120	***Weld Australia - Increasing the Welding Quality Standards***
	APSA Booth – 5A39 Presenter: Michael Pitt State-of-the-art welding simulators are being installed around Australia, including the Regency Campus of TAFE SA to prepare South Australians for job opportunities in naval shipbuilding. Welding techniques required for shipbuilding are of a higher quality standard than regular welding techniques used in construction and manufacturing – welding simulators will allow students to practice their technique until they consistently meet the quality standard.
1130-1150	***Forum8 AU - 3D Virtual Reality / Environmental Modelling Software***
	APSA Booth – 5A39 Presenter: Anita Byrnes Forum8 develops 3D virtual reality/environmental modelling software, used in simulated driver training, and in engineering and human behaviour research. A suite of tools for terrain, road and virtual environment creation, and for driver logging and assessment, will be demonstrated. Forum8 links with various driving and walking simulators, and with VR headsets such as Oculus and Vive.

1200-1220	**Rockwell Collins - The Future of Joint Fires: Extreme Battlefield Offensive Support System (XBOSS)**
	Rockwell Collins Booth – 2M22 Presenter: David Johnson In the future the Joint Fires Specialist will be removed from the immediate battlefield and housed in a self-sustainable ballistic transportable box. The Extreme Battlespace Offensive Support System will provide the Joint Fires Specialist a synthetic environment of “fused reality” to conduct joint fires.
1300-1320	**Cubic Defence Australia - EXCON Solutions**
	Cubic Defence Australia Booth – 1C3 Presenter: Mark Horn Cubic will be demonstrating EXCON solutions for high level collective training events and for lower level training, such as homestation training with a synthetic wrap able to deliver joints effects to the individual soldiers and platforms in the live training event.
1330-1350	**Cedar - *Operator Workload and Performance Assessment***
	APSA Booth – 5A39 Presenter: Ryan Beruldsen Cedar is a tablet app with utility across a range of domains which have human factor-related considerations. Cedar is based on NASA’s MATB-II desktop application which is widely used in human factors and operator workload research. It provides a benchmark set of tasks to evaluate operator performance and workload which can be used across experimental and trial contexts. Refer to https://elmtek.com.au/cedar-owat/ for further information.