

Defence Human Sciences Symposium 2021 Program

Monday, 29 November

(note: all times are in Australian Eastern Daylight Time)

Time	Title	Authors
09:15	Opening and initial messages, including Welcome to Country and senior representatives from Victoria University and the Department of Defence Chair: Dr Nick Beagley, Department of Defence	
	<i>Session 1: Operating in Cyber; Information Warfare; and Chemical, Biological, Radiological, and Nuclear environments</i> Chair: Dr David Crone, Department of Defence	
10:00	Organisational Fake News: Does it Matter Who Corrects it and What They Say?	Benjamin Kropf, Kathryn Parsons and Martin Wood
10:20	Countering Grey Zone Warfare Using Open-Source Intelligence to Interrupt Online Radicalisation Narratives	Carmen Jacques, Lelia Green, Kosta Lucas, Nuria Lorenzon-Dus, Lella Nouri and Daniel Baldino
10:40	The Strategy of Proxy Warfare: A Framework for Operation OKRA Analysis	Andrew Maher
11:00	<i>BREAK</i>	
11:20	Overcoming Human Performance Challenges of Operating in CBRN Environments	Harriet Slack and Philip Temby
11:40	Validating unobtrusive measures of psychological states to predict negative responses to distressing imagery for resilient human performance	Carolyn Semmler, Sau Yee Yiu, Desmond Yau, Gary Hanley, Kym Meaney, Rebecca Heyer, Sam Darvishi, Siobhan Banks, Reg Nixon and Melanie Takarangi
12:00	Cognitive Biosecurity: Assessing and training perceptual expertise for Defence biosecurity threats	Matthew Thompson, Varun Gandhi, Guillermo Campitelli, Chad Hewitt, Kelly Tartano, Rebecca Ware, Shayne Loft, Richard Piola, Marnie Campbell and Zach Hambrick
12:10	Towards enhancing human cognition in the cyber domain: insights from a scoping review	Benjamin Hoggan
12:20	Cybersecurity behaviours under cognitive load: are you more vulnerable when you are tired?	Andrew Reeves, Dragana Pittas and Paul Delfabbro
12:30	<i>LUNCH</i>	
13:30	<i>Posters on Demand Author Q&A</i>	
14:00	Defence Keynote: Commodore Andrew Quinn, Director General Surface Combatants and Aviation	

Session 2: Sleep + Fatigue		
Chair: TBA		
14:40	P3R - Persistence of sleep restriction during Army basic training	Penelope Larsen, Jace Drain, Neil Gibson, John Sampson, Scott Michael, Gregory Peoples and Herbert Groeller
15:00	A Smart LED Lighting System Increases Polysomnography-Derived Sleep Duration Relative to Current Lighting Conditions in Encapsulated Environments.	Nicole Stuart, Jack Manners, Alisha Guyett, Hannah Scott and Peter Catcheside
15:20	Understanding the dynamic relationship between fatigue and workload in submarine operations: Evidence from sea trials	Belinda Cham, Alexandra Boeing, Michael David Wilson and Karina Jorritsma
15:40	BREAK	
16:00	P3R - Exploratory Evaluation of Daily Workload and Sleep during the Infantry Initial Employment Training Course	Penny Larsen, Jace Drain, Michael Kitcher and Herbert Groeller
16:10	A personalised digital sleep and circadian management tool for human performance	Tracey Sletten, Prerna Varma, Jade Murray, Michelle Magee, Lauren Booker, Sanji Kanagalingam, Svetlana Postnova, Andrew Phillips, Mark Howard and Shantha Rajaratnam
16:20	The Impact of Workload, Sleep Deprivation and Time of Day on Sustained Attention	Isabella Marando, Raymond Matthews, Linda Grosser, Crystal Yates and Siobhan Banks
16:30	Differential effects of sleep deprivation and sleep restriction on real-time decision error awareness	Johanna M Boardman, Zachariah R Cross, Michelle M Bravo, Thomas Andrillon, Eugene Aidman, Clare Anderson and Sean Drummond
16:40	Using non-invasive brain stimulation to offset the effects of sleep deprivation	Martin Sale
16:50	Combining countermeasures: napping and caffeine gum to improve performance during nightshift	Crystal Yates, Jacqueline Stepien, Jillian Dorrian, Alison Coates, Kurt Lushington, Allan Evans, Stephanie Reuter and Siobhan Banks
17:00	END OF DAY	

Tuesday, 30 November

Time	Title	Authors
	<i>Session 3: Novel interventions to improve performance</i> Chair: TBA	
09:00	Building a transdisciplinary expert consensus on the neurocognitive drivers of performance under pressure: An international Delphi study	Lucy Albertella, Rebecca Kirkham, Amy B. Adler, John Crampton, Sean Drummond, Gerry J. Fogarty, James J. Gross, Leonard Zaichkowsky, Eugene Aidman and Murat Yucel
09:20	Improving musculoskeletal injury surveillance methods in Special Operation Forces: A Delphi consensus study	Joanne Stannard, Caroline Finch and Lauren Fortington
09:40	Improving Soldier Targeting Performance Through Head and Weapon Mounted Displays	Chris Brady, Angela Bender, Sasha Quayum and Ryan Dummin
10:00	Predicting team performance from neural activity: Evidence from real-world military training	Zachariah Cross, Alex Chatburn, Lee Melberzs, Philip Temby, Diane Pomeroy, Matthias Schlesewsky and Ina Bornkessel-Schlesewsky
10:20	The Impact of Digital Image Configuration on Periscope Operator Workload, Situation Awareness and Performance	Steph Chen, Zach Howard, Stephen Pond, Troy Visser, Jason Bell, Gavin Pinniger, Jessica Irons, Megan Schmitt, Madison Fitzgerald, Matthew Stoker, Owen Carter, Sam Huf and Shayne Loft
10:40	Dietary supplement use in the ADF: time for change?	Bianka Probert, Rosa Peterson and Bradley Baker
11:00	<i>BREAK</i>	
11:20	Effects of a Sports-Hydration Drink Containing High Amylose Starch on the Hydration Status and Cognitive Performance of Infantry Soldiers	Bianka Probert, Rosa Peterson and Bradley Baker
11:30	Effects of combined cognitive and physical training on cognition in healthy young adults: A systematic review	Sasha Nahleen, Philip Temby, Ben Rattray, Amit Lampit and Jonathan Connor
11:40	The Effect of Full Motion Video from Uninhabited Aerial Systems on Maritime Picture Compilation Task Performance	Tom Fahy and Kingsley Fletcher
11:50	Integrated multi-modal evaluation of Augmented Reality information systems for active tasks	Anna Ma-Wyatt, Larissa Cahill, Dominic Thewlis, Jessica O’Rielly, Steven Wiederman, Ryan Dummin, Steven Cook, Marlon Blencowe and Edward Palmer

12:00	Next generation colour displays and Laser Eye Protection: optimising both performance and safety	Amanda Douglass, Larry Abel and Maria Gavrilescu
12:10	Using Weapon-Mounted Sensors for Combat Shooting Training	Jemma Coleman and Mark Biviano
12:20	Investigating the benefits and costs of target detection aids.	Salvatore Russo, David Nicoll, Megan Bartlett, Mike Nicholls and Oren Griffiths
12:30	<i>LUNCH</i>	
13:30	<i>Posters on Demand Author Q&A</i>	
	<i>Special session: Shaping the Defence Human Sciences Community</i> Chair: Dr Susannah Whitney, Department of Defence	
14:00	Augmenting Ability Collaborative Research Centre (CRC) update	Siobhan Banks
14:15	Defence Research Ethics Review: From Compliance to a User-friendly Quality Assurance Mechanism	Lisa Headley, Warren Roberts, Kathryn Parsons, Alison Fogarty, Megan Schmitt, Angela Arvanitis, Brandon Pincombe, Christopher Best, James Brooks, Dragana Pittas, Martin Wood, Sarah Leslie, Joanne Allard, Yasmine Shaheem, Eugene Aidman
14:35	Panel: Human Sciences in the time of COVID	Peta Mantel, Darrin Tyson, Susannah Whitney, Troy Visser and Vanessa Bowden
15:30	<i>BREAK</i>	
	<i>Session 4: R3 - resilience, readiness, recovery</i> Chair: TBA	
15:45	A biofeedback-enabled, virtual reality, stress management training application for military trainees: From concept development to implementation.	Murielle Kluge, Eugene Nalivaiko, Rohan Walker and Eugene Aidman
16:05	Fostering Team Resilience via the 'STOP then Resource' Reflection Protocol: A Pilot, Non-Randomised Investigation of Feasibility Within Military Settings	Michael Chapman, Philip Temby, Lee Melberzs, Monique Crane and Daniel Gucciardi
16:25	Trauma history is associated with a 1/f Electroencephalography signature in the MEAOPS combat sample	Kai Tit Tan, Andrew Lawrence, Ellie Lawrence-Wood, Suzanne Edwards, Nigel Rogasch, K Oliver Schubert, Mitchell Goldsworthy, Scott R Clark and Alexander McFarlane
16:35	The Longitudinal Australian Defence Force (ADF) Study Evaluating Resilience: A summary of key findings and themes from a ten year research	Lisa Dell, Carolina Casetta

	program evaluating resilience in early career	
16:45	The Lived Experience of Psychological Contract Formation and Breach in the Australian Defence Force: An Interpretative Phenomenological Approach	Anjum Naweed, Luke Hodgkinson and Raymond Matthews
16:55	Understanding Navy deployment at sea: Qualitative study of demands, resources, recovery, and resilience during maritime operations	Gavin Hazel, Monique Crane, Daniel Gucciardi and Ben Searle
17:05	The Acute Readiness Monitoring Scale (ARMS): Assessing predictive and concurrent validation	Simon Summers, Richard Keegan, Andrew Flood, Kristy Martin, Andrew McKune and Ben Rattray
17:15	Decision aids can improve operator resilience by enhancing learning	Oren Griffiths, Aidan Court, Sal Russo, Irina Baetu, Megan Bartlett, Gemma Robertson and Mike Nicholls
17:25	<i>END OF DAY</i>	

Wednesday, 01 December

Time	Title	Authors
	<i>Session 5: Characterising the environment and effects on performance</i> Chair: Dr Mark Patterson, Department of Defence	
09:00	Can communication dynamics be used to predict team cognition in command-and-control contexts?	Simon Hosking, Melissa Stolar, Patrick Watkinson, Chris Best and Dawei Jia
09:20	Understanding how submariner work design relates to performance and workforce sustainability: Preliminary outcomes from a whole-of-workforce survey	Alexandra Boeing, Belinda Cham, Katrina Hosszu and Karina Jorritsma
09:40	A Comparison of Overground and Treadmill Walking During Exoskeleton Assisted Load Carriage	Logan Hard, Kurt Mudie, Daniel Billing and Rezaul Begg
10:00	P3R - A comprehensive analysis of injuries during Army basic military training: Do reporting methods matter?	Neil Gibson, Jace Drain, Penelope Larsen, Scott Michael, Herb Groeller and John Sampson
10:20	A longitudinal exploration into the effects of 1RTB military training on aspects of cognition, well-being and diet in Australian Army recruits: Preliminary findings from the HPRnet Microbiome study	Matthew Cooke, Katie Tooley, Sarah Catchlove, Con Stough, Shakuntla Gondalia, Bradley Baker and Regina Belski
10:40	Blood based biomarkers of cognitive and physical performance	Daniel Barratt, Joshua Holmes, Sanam Mustafa, Juliana Bajic, Daniel Kolarich, Nicki Packer, Ewa Goldys, Ian McKeown, Anna Ma-Wyatt, Carolyn Semmler and Mark Hutchinson
11:00	<i>BREAK</i>	
11:20	Recruitment into Elite Soldier Units: A Physical Readiness Study	Lisa Wolski, Alison Fogarty, Benjamin Kamphuis, Tavis Nicholson and Mark Halaki
11:30	P3R — Physical and Physiological Demands of Basic Military Training	Scott Michael, Jace Drain, Penelope Larsen, Neil Gibson, Aleck MacNally and Herbert Groeller
11:40	Human Intrinsic Capacity Index as a Measure of Performance in Military Science	Azmeraw Amare, Liliana Ciobanu, Beben Benyamin, Scott Clark and Renuka Visvanathan
11:50	The Effect of Biological Sex on Lower-Limb Coordination Variability During Load Carriage	Brooke Hoolihan, Jon Wheat, Ben Dascombe, Danielle Vickery-Howe and Kane Middleton

12:00	The Effect of Weapon Handling on Stride Time Variability	Patrick Slattery, Luis Eduardo Cofre Lizama, Jon Wheat, Paul Gastin and Kane Middleton
12:10	Decision strategies: causal investigations of the trade-off between decision speed and accuracy in the frontal cortex	Hannah Filmer and Paul Dux
12:20	Predicting performance on a simulated submarine control room task from discrete cognitive abilities and resting-state EEG	Chloe Dziego, Ina Bornkessel-Schlesewsky, Sophie Jano, Alex Chatburn, Matthias Schlesewsky, Maarten Immink, Ruchi Sinha, Sam Huf, Jessica Irons, Megan Schmitt, Steph Chen and Zachariah Cross
12:30	Random Forest for Event Classification of Eye Movements: Towards Effective Cognitive Workload Estimation	Hadia Tazeem, Atul Sajjanhar, Tsz-Kwan Lee and Dawei Jia
12:40	<i>LUNCH</i>	
13:40	<i>Posters on Demand Author Q&A</i>	
	<i>Session 6: Human and human-machine teams</i> Chair: TBA	
14:10	Case Study: Ethical AI in Defence and Allied IMPACT	Dianna Gaetjens, Kate Devitt and Chris Shanahan
14:30	Getting Team Members on the Same Page by Enhancing Shared Mental Models: A Systematic Review and Meta-Analysis of Controlled Trials	Daniel Gucciardi, Robin Lines, Benjamin Hoggan, Sasha Nahleen, Philip Temby and Monique Crane
14:50	The Impact of Leadership Behaviors on Team Trust, Team Voice and Decision Making in the Extreme Action Teams	Ruchi Sinha, Gillian Yeo, Cecilia Tournour, Dilkash Parabia, Andrew Yu, Bart De Jong and Chia-Yen Chiu
15:10	<i>BREAK</i>	
15:20	Team Dynamics for Enhancing Decision-Making	Sebastian Tsui, William Tang, Yoona Choi and Wesley McTernan
15:30	Modelling and monitoring human operator performance	Jessica O’Rielly, Kelli Francis-Staite, Langford White, Justin Fidock and Anna Ma-Wyatt
15:40	Training and Educational Requirements of Australian Future Autonomous Ship’s Operator	Gholam Reza Emad, Rachel Horne and Mehrangiz Shahbakhsh
15:50	Digital Twins as a Human-Autonomy Teaming Decision Aid	Rachel Mate
16:00	Designing for Agility in an Envisioned Command and Control World: Application of Cognitive Work Analysis to Human-AI Teams	Rebecca Ong and Neelam Naikar
16:10	<i>BREAK</i>	

16:30	Closing ceremony: - Presentation of awards - Closing remarks and thanks
17:00	<i>CONFERENCE ENDS</i>

Posters on Demand

Title	Authors
Theme: Sleep and Fatigue	
Trait-level Cognitive and Psychological Factors Associated with Resilience to Sleep Disturbance during COVID-19	Sean Drummond, Joshua Wiley, Johanna Boardman, Tony Cunningham and Elizabeth Kensinger
The Timing of Daytime Sleep can be used Strategically to Manipulate the Response of the Internal Body Clock to Night Work.	Greg Roach, Drew Dawson and Charli Sargent
The influence of variability in bed and wake times on quality of sleep in elite athletes	Shona Halson, Rich Johnston, Charli Sargent and Greg Roach
Theme: Novel interventions to improve performance	
The Role of Established and Newly Proposed Cognitive Fitness Constructs in Compliance with COVID-19 Protective Measures and Psychological Recovery: A Validation Study	Sabina Kleitman, Dayna J. Fullerton, Lisa Zhang and Eugene Aidman
P3R - Impact of a pre-conditioning program on training outcomes in female Army recruits	Jace Drain, Penny Larsen and Herbert Groeller
Exploring changes in the host gut microbiota during a controlled human infection model for <i>Campylobacter jejuni</i>	Blake Stamps, Janelle Kuroiwa, Sandra Isidean, Megan Schilling, Clayton Harro, Kawsar Talaat, David Sack, David Tribble, Alexander Maue, Joanna Rimmer, Renee Laird, Chad Porter, Michael Goodson and Frédéric Poly.
Improving automation supervision: Can a voluntary checking tool mitigate the costs of high-degree automated support?	Vanessa Bowden and Shayne Loft
Influence of a Sparta Pre-habilitation program on Injury Risk in Army personnel (InSPIRA)	Chelsea Smith, Kenji Doma, Brian Heilbronn, Jace Drain and Anthony Leicht
Interaction in virtual environments	Ken McAnally and Guy Wallia
The Effects of Decision Aid Presentation on Decision-Making in a Multi-Cue Signal Identification Task	Jessica Szulc, Kingsley Fletcher and Cassandra Heffernan
Medical Training for Remote and Extreme Environments	Sarah Bascomb, Edi Albert, Brenton Systermans, Lari Trease, Gordon Cable and Glenn Singleman
The effects on cognitive performance of apparel fibre type and task complexity	Carolyn Semmler, Amy Nielson, Charlie Scott and Sam Ropert
Artificial Intelligence based Smart Technology for Engineering Education Training	Monica Racha, Siva Chandrasekaran and Alex Stojcevski
Improving the measurement of attentional conflict resolution	Talira Kucina, Lindsay Wells, Amelia Kohl, Ian Lewis, James Sauer, Matt Palmer, Kristy de Salas and Andrew Heathcote
Future Force: Enhancing Shipbuilding Operations with Exoskeletons	Robert Trott, Chambers Annabelle, Armando Vozzo, David Hobbs and Giselle Rampersad
Augmenting military pilot training through an unobtrusive eye-tracking system	Alexander Robinson, Kyle Wilson, Mike Lenné and Mark Corbett

Theme: R3: resilience, readiness, recovery	
Monitoring Recovery From Muscle Damage Caused By Training	Chris James and Peter Arthur
Using Past and Present Indicators of Human Workload to Explain Variance in Human Performance	Zach Howard, Ami Eidels, Reilly Innes and Shayne Loft
Performance-Focused Cognitive Fitness Intervention for Athletes Affected by COVID-19	John Crampton, Jeffrey Bond, Gerry Fogarty, Tony Morris and Len Zaichkowsky
A Meta-analysis of Deployment-related Demands and Resources for Emotional Resilience, Cognitive Functioning and Job-performance in Military Personnel	Monique Crane, Daniel Gucciardi, Gavin Hazel, Arian Kunzelmann, Thomas Rigotti, Ben Searle and Eyal Karin
The Role of Emotional Awareness: A Qualitative Investigation into the Resilience of Emergency Services Personnel	Emily Jacobs and Richard Keegan
Risk, Resilience and Recovery: Maximising Human Health and Performance in Extreme Environments through Interdisciplinary Translational Research Paradigms	Kimberley Norris, Roger Stanley, Nathan Pitchford, Steven Curnin, Graeme Zosky, Benjamin Brooks, Andy Flies, Angela Martin, Meredith Nash, Megan Woods and Sarah Bascomb
Theme: Characterising the environment and effects on performance	
The physiological effects of weapon handling during load carriage	Danielle Vickery-Howe, Jace Drain, Ben Dascombe, Anthea Clarke and Kane Middleton
Soldier neuromuscular fatigue in response to varying simulated occupational field tasks: utility of the counter movement jump and isometric mid-thigh pull.	Michael Macartney, Tavis Nicholson, Benjamin Kamphuis, Lisa Wolski, Alison Fogarty, Robert Dunlop, Herbert Groeller and Gregory Peoples
Gut microbiota and its neuroactive potential correlated to cognitive functions in the healthy elderly adults	Mrudhula Komanduri, Con Stough and Shakuntla Gondalia
Mechanisms of vigilance loss: Sensitivity decrements less robust than bias shifts and attentional lapses	Shannon Gyles, Jason McCarley and Yusuke Yamani
The effect of weapon handling and walking speed on local dynamic stability of gait	Luis Eduardo Cofre Lizama, Kane Middleton, Patrick Slattery and Jon Wheat
Physical and Physiological Load Monitoring in Military Settings — Opportunities and Pitfalls	Scott Michael
The most discriminant components of force platform data for gait based person re-identification	Kayne Duncanson, Simon Thwaites, David Booth, Gary Hanly, Ehsan Abbasnejad, William Robertson and Dominic Thewlis
Predicting real-time listener engagement from electrical brain activity: a proof-of-concept study	Ashley Platt, Louise Kyriaki, Matthias Schlesewsky and Ina Bornkessel-Schlesewsky
Early detection of high risk trials during manual handling tasks using machine learning models	Abdelrahman Zaroug, Alessandro Garofolini, Jasmine Proud, Daniel Lai and Rezaul Begg

Effect of exercise training programs on musculoskeletal physical fitness domains in military personnel: A systematic review and meta-analysis.	Chelsea Smith, Kenji Doma, Brian Heilbronn and Anthony Leicht
Towards “appreciation superiority”: a set of proxy measures	Luke Thiele and Philip Temby
The Influence of Grip Strength on Marksmanship	Emma Hall and Jemma Coleman
A method to define athlete manoeuvrability in field-based team sports	Grant Duthie, Sam Robertson and Heidi Thornton
Strategy use with an optimal observer aid in noisy multiple-cue judgments	David Nicoll, Kingsley Fletcher, Megan Bartlett, Oren Griffiths, Mike Nicholls and Jason McCarley
Assessing lower limb running biomechanics using inertial measurement units	David Opar, Kara Price, Ryan Timmins, Jack Hickey, Scott Hulm and Nirav Maniar
Semi-Active Low-profile Assistive Arm-Exoskeleton System with an Adaptive Configuration	Asher Winter, Darius Nahavandi and Navid Mohajer
Expertise and Skill Learning Knowledge Can Accelerate Performance of Soldiers	Sean Muller, Evan Dekker, Khaya Morris-Binelli, Benjamin Piggott, Gerard Hoyne, Zach Hambrick and Wayne Christensen
Effect of load carriage on gait variability: a case study	Alessandro Garofolini, Simon Taylor and Rezaul Begg
P3R - The Whole Blood Fatty Acid Profile and the Omega-3 Index of Australian Army Recruits over the Course of Basic Military Training.	Gregory Peoples, Penelope Larsen, Heather Bowes, Jarrin Coombes, Jace Drain, Herbert Groeller and Peter McLennan
Reliability of Sparta Science assessments in Army personnel	Anthony Leicht, Chelsea Smith, Kenji Doma, Brian Heilbronn and Jace Drain
Theme: Human and Human-Machine Teams	
Autonomous Systems Reducing the Burden of Last Mile Logistics Resupply	Matthew Lane, Rita Arrigo, Ben Southgate and Marceline Overduin
Conceptualising the Work Domain of Human-Machine/AI Teams in the Future Force	Sheena Care and Neelam Naikar
A Closed-Loop AR-based System for Real-World BCI Application	Yu-Kai Wang and Campbell Gorman