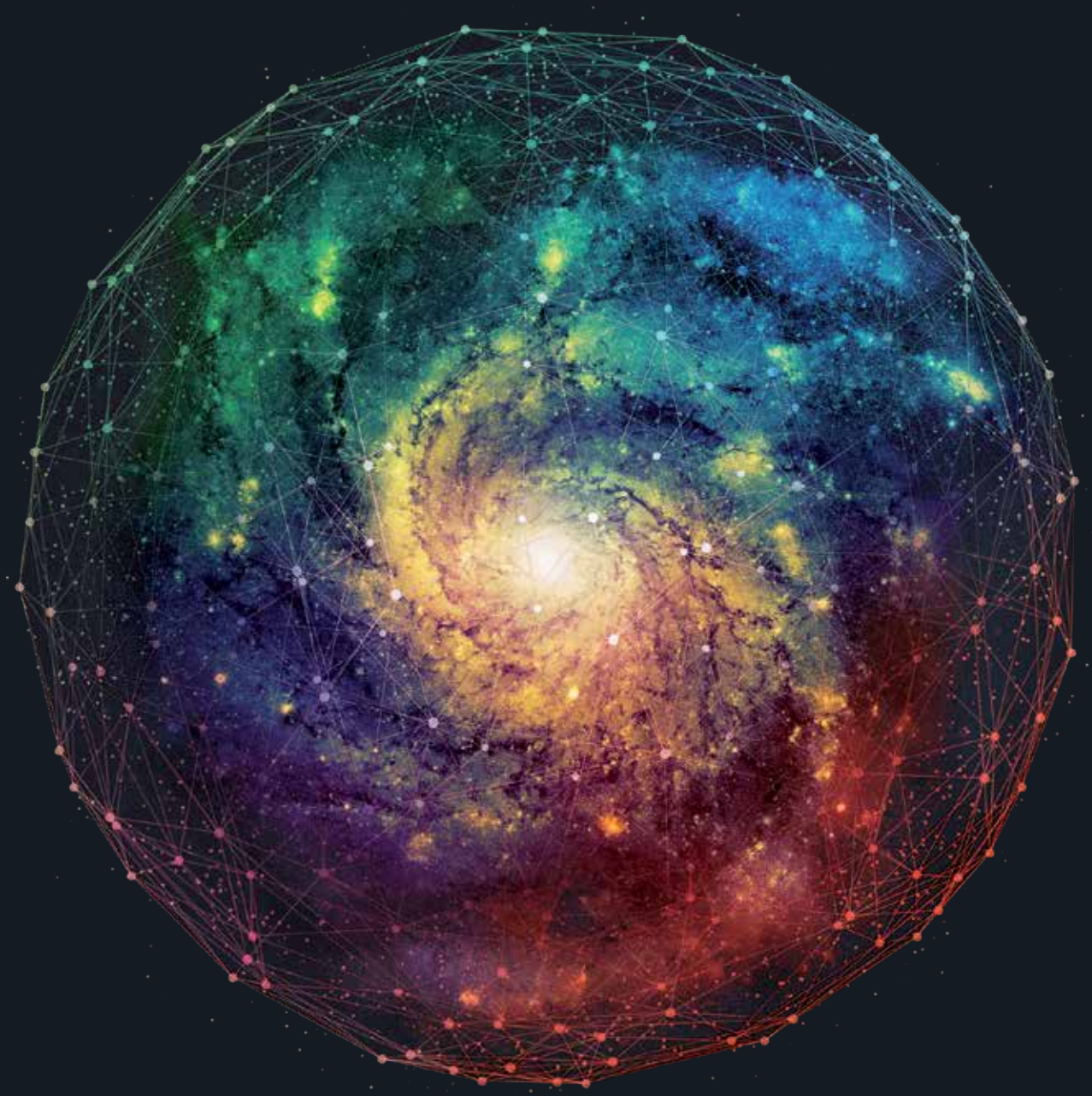
2020 RESEARCH AREAS AND SUPERVISORS

SCIENCE

AUSTRALIA ECU EDITH COWAN UNIVERSITY



WORLD READY

2020

THERE IS WHERE YOU ARE RIGHT NOW, AND THERE IS WHERE YOU WANT TO GET TO. IN BETWEEN YOU NEED A BRIDGE. ECU IS THAT BRIDGE BETWEEN YOUR WORLD, AND THE WHOLE WORLD.

BECOME WORLD READY AT ECU.

CONTENTS

ECU is committed to reconciliation and recognises and respects the significance of Aboriginal and Torres Strait Islander peoples' communities, cultures and histories. ECU acknowledges and respects the Aboriginal and Torres Strait Islander peoples, as the traditional custodians of the land. ECU acknowledges and respects its continuing association with Nyoongar people, the traditional custodians of the land upon which its campuses stand.

MESSAGE FROM THE ASSOCIATE DEAN OF RESEARCH

The School of Science has world leading researchers with state-of-the-art facilities. Our researchers aim to improve the sustainability of our natural environment on both land and in the water. They use omics approaches to provide solutions that improve the health and well-being of the our communities. They also strive to make our technological environment better and safer through innovative approaches. Our research is strengthened through our links to industry, government agencies and the communities to ensure that outcomes are socially and environmentally meaningful.

We pride ourselves on high quality postgraduate training and mentorship, based on dedicated and experienced researchers who focus on quality research and training. We strongly believe that the learning experiences and the outcomes of postgraduate studies are enhanced through engagement, particularly with industry, government and other research organisations. Also, the diversity of research areas and skills in the School provides enviable opportunities to capitalize on this diversity and develop interdisciplinary research.

If you are inspired to take the next step and undertake postgraduate studies, I invite you to explore opportunities in the School of Science. This brochure provides a good starting point, so explore our research areas, researchers, and existing research projects. I then encourage you to contact the relevant people to discuss opportunities for postgraduate studies in my School.

ASSOCIATE PROFESSOR UTE MUELLER
ASSOCIATE DEAN RESEARCH
SCHOOL OF SCIENCE

ECU RESEARCH THEMES & PRIORITY AREAS

Research at ECU is focused on 4 main research themes:

- Health: Prevention, detection and management of disease and injury
- Society and Culture: Impacting and supporting social change through ensuring diversity, creativity, cultural identity, education, personal and organisational success and social justice
- Natural and Built Environments: Understanding, harnessing, building and protecting environments for sustaining people, place and planet
- Securing Digital Futures: Enabling a safe, secure, productive and enterprising digital environment

ECU's research is characterised by its fundamental commitment to the pathway from basic research to translation to innovative implementation (including practice, service delivery, and industry adoption).

ECU's commitment to this research pathway is reflected in its cross-cutting approach to research across each of its research themes and priority areas. These cross-cutting approaches are:

- A strong research–practice interface, including research-led practice and practice-led research, that involves and engages the professions, service-delivery agencies and other end- users (patients, clients, consumers, industry).
- Strengthening the evidence base by responding to the needs of high-end practitioners, policy-makers, guideline developers, activists, companies and governments, thereby ensuring they have access to expert advice and robust data for decision-making.
- Assessment, evaluation, advocacy, policy-making throughout all stages of planning, measurement and monitoring as well as the early stages of innovation.
- Indigeneity and diversity to reach a fuller understanding of aboriginal knowledge, practice, and belief and the diversity of the cultures among which we live and research.

RESEARCH AREAS

Our research is highly diverse. This not only provides a wide range of opportunities for postgraduate studies, but also the opportunity to adopt interdisciplinary and innovative approaches to solve real-world problems.

Research in the school is led by highly qualified, dedicated and internationally-recognised researchers, supported by state-of-the-art technology and strong links with industry and government to create research that makes a difference. Our researchers and facilities provide a supportive and rewarding experience for research students.

A taste of the diversity and types of research are highlighted by examples for each of our research areas.

Researchers in the School of Science are at the cutting edge of omics research. Our research is underpinned by world-class analytical facilities that can be applied to solve complex problems in the field of biological, environmental, forensic and medical sciences, just to name a few.

Our researchers, through the exciting emergence of metabolomics technology, are examining complex biochemical processes that form the building blocks for life, and determining how this knowledge can be applied to solve issues in both health and the environment.

Our research capability in transcriptomics, proteomics and computational systems biology can define the pathways involved in plant protein synthesis, the effects of the environment on agricultural systems, and understand how food processing impacts protein. Our expertise has enabled us to examine the link between protein expression and human health. For instance, understanding those proteins that cause allergy and intolerance and developing innovative methods for safeguarding the health of those afflicted by these conditions.

In a world of rapidly changing digital technologies, our computing researchers are innovative and committed to enhancing the lives of our communities through creating better and safer computing environments. Through artificial intelligence and computer visualization, they create intelligent solutions in various domains such as computer games and biometrics. Our researchers are also improving business decisions through the use of web-based intelligent decision support systems.

Never before has cyber and digital security been more important. Our researchers are leaders in digital security and forensics. They deliver immediate and high impact outcomes in the areas of computer and digital forensics, network and wireless security, information warfare, physical security, risk management and aviation security.

The school's research in biological and environmental sciences has been ranked as world class, focusing particularly on the interactions among different forms of flora and fauna, the environment and humans. Working in a range of environments from woodlands to wetlands and the ocean, our ecologists aim to protect vulnerable native species and improve the sustainable use of our natural environment in the face of urban development and climate change.

Our marine researchers are at the forefront of research into blue carbon, showing that seagrasses are the most effective ecosystem at sequestering carbon from the atmosphere. They are also using novel approaches to understand connections among different marine ecosystems that underpin marine park management.

Our state-of-the-art facilities provide the perfect environment to undertake research in microelectronics and photonics. Through close links with industry, government and environment sectors, our researchers develop novel, integrated intelligent structures for applications in a range of areas.

This has led, for example, to the development of a highly innovative photonics-based weed sensor that will allow for an accurate approach to weed control in agriculture, and a better outcome for the environment and our health.

ECU SECURITY RESEARCH INSTITUTE

With a reputation as one of the leading cyber security and digital forensic groups in the world, the ECU Security Research Institute (ECUSRI) has emerged as one of Edith Cowan University's most vital research groups, delivering immediate and high impact outcomes in the areas of digital forensics, cyber security, critical infrastructure security and human security.

The ECUSRI was formed in 2012 to fully integrate security research at ECU and provides a platform for delivering cutting edge, contemporary security research and technology development. Currently the Institute's members are working with government agencies and industry partners to develop tangible research outcomes in the broader security environment.

Our research themes at the ECUSRI include:

- Digital Forensics
- Cyber Security
- Critical Infrastructure Security
- Human Security

The ECUSRI delivers multi-disciplinary research outcomes, regularly drawing on expertise from within the School of Science, as well as the Schools of Arts and Humanities (Psychology), Engineering and Business and Law. The Institute has a significant support infrastructure and skilled technical support base providing the foundation for a productive research team that prides itself on quality and timely output.

We encourage enquiries from students and researchers wishing to pursue research activities with the ECUSRI and welcome enquiries from industry partners who are seeking solutions or collaborations in relevant research areas through Research and Development.

For more information, visit: www.ecu.edu.au/schools/science/research-activity/ecu-security-research-institute

CONTACT:

Email: sri@ecu.edu.au

ELECTRON SCIENCE RESEARCH INSTITUTE

The Electron Science Research Institute (ESRI) carries out fundamental and applied research in microelectronics and photonics and ventures into related areas of nano-technology to develop novel integrated intelligent structures for applications in the ICT, Health, Agri-bio, Security, Sensing, Defence and Environment sectors.

Electron science is based on the revolutionary marriage of microelectronics and photon based sciences with that of nano- and bio-technologies. It underpins developments in, information and communications technologies (ICT), health, environment and energy, which will allow the creation of an entirely new range of products and services.

The Electron Science Research Institute (ESRI) was established at ECU in 2003. Our aim is to excel in fundamental and applied research in microelectronics and photonics and to venture into related areas of nano-technology to develop novel integrated intelligent structures capable of adaptively processing ultra-wideband signals for key global market applications as well as creating a new platform for low-power system-on- chip integration.

Building on its excellence in micro/nano-photonic and electronic research, ESRI is currently extending its expertise and knowledge base into new areas such as advanced precision agriculture, bio-photonics, high-efficiency solar cells, security and defence laser intruder detection systems for security and national defence.

ESRI has built strong links through close interaction with the WA government and communities, as well as with national and international institutions and industries. ESRI has attracted industry research contracts for the development of micro-photonics-based prototypes, namely, laser-based weed identification and discrimination; magnetic-based telemetry for core level indication; laser arrays for airborne radar; board-to-board optical interconnects; opto-VLSI-based tuneable lasers; near infrared breast scanning; and magneto-photonics micro-displays.

For more information, visit: www.ecu.edu.au/schools/science/research-activity/electron-science-research-institute

CONTACT:

Professor Kamal Alameh
Email: k.alameh@ecu.edu.au

CENTRE FOR ECOSYSTEM MANAGEMENT

ECU's Centre for Ecosystem Management has made a longstanding contribution to ecological research within Australia. Established in 1995, the Centre continues to adopt a comprehensive approach to ecosystem research, with members of the Centre fostering an awareness and understanding of the environment, and demonstrating a commitment to the maintenance of biodiversity, sustainability, and the improvement in the quality of life through their research interests.

Our dedicated Centre members, research fellows, postgraduate students, and adjunct researchers work closely with national, state, and local government, conservation groups, and community, industry, consultants, and other research institutions with the aim of achieving effective ecosystem management, conservation and ecological research.

Our researchers seek an understanding of the ecological processes associated with human activities. We actively encourage our members to communicate our research progress with the wider community

The Centre provides opportunities in postgraduate studies, and welcomes visiting researchers, interns, and volunteers to be part of a professional and successful research centre.

The members of the Centre for Ecosystem Management are involved in both the collection of environmental data to facilitate ecosystem and biodiversity management, and the application of research findings within environmental and societal contexts.

Research within the Centre contributes to a diverse range of topics, including freshwater ecosystems, ecological water requirements, resolving problems of habitat degradation, mine site rehabilitation, pollution, the ecology of forests and woodlands, conservation, and cultural perceptions of (valuing) the environment.

Our approach develops a partnership between ecology and management. We believe the best solutions for environmental problems can only be achieved through an interdisciplinary approach. The Centre's research is largely conducted under four major themes:

- Ecology and Ecophysiology (including ecohydrology, landscape ecology)
- Conservation Biology and Biodiversity (including biogeography, systematics)
- Ecological Restoration (including mine site rehabilitation)
- Sustainability and Health (including sustainable NRM, agriculture, environmental exposures).

For more information, visit: www.ecu.edu.au/schools/science/research-activity/centre-for-ecosystem-management

CONTACT:

Professor Pierre Horwitz
Email: p.horwitz@ecu.edu.au

CENTRE FOR MARINE ECOSYSTEMS RESEARCH

At the Centre for Marine Ecosystems Research (CMER) we use applied and fundamental research to improve our understanding of the ecological processes of coastal marine systems, and how these respond to both natural and human induced pressures.

The Centre for Marine Ecosystems Research (CMER) has built a solid reputation with its collaborative approach in coastal marine research in Australia and worldwide.

The Centre conducts research across the themes of:

- Habitat Connectivity and Trophic Interactions
- Management of Human Impacts
- Conservation and Fisheries Biology
- Blue Carbon & Paleo Reconstruction
- Marine Radioactivity & Tracers
- Marine Microbial Ecology

These themes encompass a wide range of ecosystems in both tropical to temperate environments.

Comprising a highly talented leadership team, postdoctoral research fellows, postgraduate students and adjunct researchers from CSIRO, state government and several international universities and research organisations, our approach in investigative research will continue to influence the management of existing and potential concerns in the marine environment.

Past graduates and members of the Centre are currently employed in a wide range of academic, regulatory and industry positions around the globe. We welcome and provide opportunities for visiting researchers, exchange and postgraduate students, interns, and adjuncts to become part of a respected international marine research Centre.

For more information, visit: www.ecu.edu.au/schools/science/research-activity/centre-for-marine-ecosystems-research

CONTACT:

Director
Professor Paul Lavery
Email: p.lavery@ecu.edu.au

Deputy Director
Associate Professor Kathryn McMahon
Email: k.mcmahon@ecu.edu.au

CENTRE FOR INTEGRATIVE METABOLOMICS AND COMPUTATIONAL BIOLOGY

The Edith Cowan University Centre for Integrative Metabolomics & Computational Biology (CIMCB) is a newly established multi-million dollar facility founded on an innovative collaboration between ECU and the multinational biotechnology company Thermo Fischer Scientific, who are world leaders in the provision of mass-spectrometry based analytical instrumentation and integrated informatics solutions.

As a sponsored "proof of concept" facility, CIMCB has preferential access to Thermo equipment, training and expertise, whilst also partnering in the development of new innovations to the benefit of the scientific community.

CIMCB is based at the School of Science, Joondalup Campus. It aims to revolutionise phenomic research by providing a unique data-centric collaborative research facility. The centre will provide state-of-the-art mass spectrometry analytical facilities supported by a comprehensive computational biology capability for the provision of reproducible data, mathematical modelling, and biological interpretation. It will pool university expertise in small molecule analytical chemistry, experimental design, biostatistics, and machine learning.

The core of the facility is a trio of high-resolution mass spectrometers: (1) Thermo Q Exactive™ LC-MS/MS, (2) Thermo Q Exactive™ GC-MS/MS, (3) Thermo Quantiva™ QQQ LC-MS, which will enable the centre to provide comprehensive coverage of the metabolome at a resolution only available through the Thermo Orbitrap™ technology.

The centre's vision is to provide a centralised incubator for rigorous world-class systems-biology research, linking scientists and students from a broad range of scientific disciplines within ECU and across WA, combined with establishing long-term collaboration with centres of excellence across the globe. Our focus on robust workflows, quality control, and intuitive data integration, will allow vibrant and innovative research to flourish, encouraging stimulating interactions between biological, medical, and computational scientists.

For more information, visit: www.cimib.info

CONTACT:

Director
Professor David Broadhurst
Email: d.broadhurst@ecu.edu.au

Deputy Director
Associate Professor Mary Boyce
Email: m.boyce@ecu.edu.au

FOOD AND AGRICULTURAL PROTEOMICS

Food and Agricultural Proteomics is a newly established multi-million-dollar facility that complements and builds on the expertise in Analytical Chemistry and Metabolomics at ECU. The laboratory undertakes fundamental and translational research in agriculture and food with a focus on proteins, the functional molecules of life.

Based at the School of Science on the Joondalup Campus, the ECU Proteomics laboratory provides access to ECU researchers, collaborators and partners to cutting-edge mass spectrometers and associated equipment.

The laboratory provides state-of-the-art mass spectrometry analytical facilities supported by bioinformatics capability for the detection, characterisation and measurement of key proteins and the interpretation of their roles within systems biology. The facility houses a high-resolution SCIEX TripleTOF 6600™ mass spectrometer equipped with a nano/micro-flow HPLC for comprehensive protein identification and global quantitation. Additionally, it houses a SCIEX QTRAP 6500™ LC-MS system for targeted quantitative proteomic analyses.

Our primary research vision is to oversee the adoption of innovative, next generation proteomics tools and workflows that enable the delivery of excellent science and impact for ECU and its partners. In the post-genomics era, proteomics and mass spectrometry (MS) can validate the predictions made by genomics/transcriptomics, but moreover can identify key proteins involved in regulating biological systems.

The group have vast expertise in grain science, having investigated yield, quality and health aspects. The tools within the laboratory are well suited for food analysis including applications in allergen detection and food intolerance.

For more information, visit: www.ecu.edu.au/schools/science/research-activity/research-support/proteomics

CONTACT:

Professor Michelle Colgrave
Email: m.colgrave@ecu.edu.au

Dr Angela Juhasz
Email: a.juhasz@ecu.edu.au

ARTIFICIAL INTELLIGENCE AND OPTIMISATION RESEARCH GROUP

The Artificial Intelligence and Optimisation Research Group (AIORC) brings together researchers with specific interest in the development of applied and basic research involving interdisciplinary concepts from artificial intelligence, optimisation and simulation, games and mobile technology, image and signal processing. We create intelligent solutions in various domains such as computer games, health information technology, resource mining, software engineering, security and biometrics.

Since 2002, members of the groups have collaborated in the co-supervision of research students, grant applications, publication of journal and conference papers and in various research projects. Together with collaborators from Edith Cowan University, The University of Western Australia and Curtin University of Technology, they have attracted research funds totalling over $2.5 million and have achieved high publication outputs.

Our members have been involved in collaborative research projects with national and international academic collaborators as well as industry personnel.

For more information, visit: www.ecu.edu.au/schools/science/research-activity/artificial-intelligence-and-optimisation-research-group

CONTACT:

Leader
Associate Professor C Peng Lam
Email: c.lam@ecu.edu.au

OUR RESEARCHERS AND SUPERVISORS

PROFESSOR DAVID BROADHURST

PhD
Director, Centre for Integrative Metabolomics & Computational Biology
Email: d.broadhurst@ecu.edu.au

Professor David Broadhurst is an internationally recognised metabolomics researcher with particular expertise in translational biomarker discovery, experimental design, biostatistics, data visualisation and machine learning. He is currently the Director of the Centre for Integrative Metabolomics & Computational Biology at Edith Cowan University (www.cimcb.info).

Professor Broadhurst has spent a significant part of his career developing personalized medicine platforms for pregnancy related diseases. Whilst at University of Alberta (Canada) he was part of an international team that developed the technology to measure a pre-symptomatic metabolic signature of onset Preeclampsia, which has resulted in an international patent and spinout company (www.metabolomicdiagnostics.com). Professor Broadhurst's current research has focused on P4 systems medicine (predictive, preventive, personalized and participatory), which aims to harness the intersection of three emerging dominant research sectors: systems biology, artificial intelligence, and personalized technology. He works closely with the Telethon Kids Institute (Perth Children's Hospital), the WA Human Microbiome Collaborating Centre (Curtin University), the ORIGINS project, the WA Health Translational Network, Bioplatforms Australia, and two leading Australian and Canadian medical devices companies. Professor Broadhurst's publications have over 10,000 citations and he has been part of multiple large grants in three continents, which have brought in over $12m in funding.

SELECTED PUBLICATIONS

Journal Articles

- Reinke SN, Galindo-Prieto B, Skotare T, Broadhurst D, Singhania A, et al. (2018) OnPLS-based multi-block data integration: a multivariate approach to interrogating biological interactions in asthma Analytical chemistry 90 (22), 13400-13408.
- Broadhurst D, Goodacre R, Reinke SN, Kuligowski K, Wilson ID, Lewis MR, Dunn WB (2018) Guidelines and considerations for the use of system suitability and quality control samples in mass spectrometry assays applied in untargeted clinical metabolomic studies. Metabolomics 14(72).
- Kirwan JA, Brennan L, Broadhurst D, Fiehn O, Cascante M, Dunn WB, Schmidt MA, Velagapudi V (2018) Preanalytical Processing and Biobanking Procedures of Biological Samples for Metabolomics Research: A White Paper, Community Perspective. Clin Chem 64(8): 1158-1182.
- Beger RD, Dunn W, Schmidt MA, Gross SS, Kirwan JA, Cascante M, Brennan L, Wishart DS, Oresic M, Hankemeier T, Broadhurst D, et al. (2016) Metabolomics enables precision medicine: "A White Paper, Community Perspective". Metabolomics 12(10): 149.
- Ahearne, C.E., Denihan, N.M., Walsh, B.H., ... Broadhurst, D.I., Murray, D.M. (2016) Early cord metabolite index and outcome in perinatal asphyxia and hypoxic-ischaemic encephalopathy. Journal of Cerebral Blood. Neonatology 110 (4), 296-302.

GRANTS

- 2018 - 2022 Securing health in Fiji through strengthened health systems and integrated water management to tackle the Three Plagues: typhoid, dengue and leptospirosis. Australian Research Council, Linkage Infrastructure, Equipment and Facilities Grants, Total Budget: $2,010,000
- 2018 – 2022 Towards a diagnostic test for rheumatic fever. National Health and Medical Research Council, Total Budget: $2,131,000

Research Interests

- Artificial Neural Networks, Machine Learning and Evolutionary Algorithms.
- Data Science applied to Systems Biology
- Bioinformatics & Chemometrics for Mass Spectrometry based Metabolomics
- Multi-omic data integration

PROFESSOR MICHELLE COLGRAVE

PhD, BSc (Hons I)
Email: m.colgrave@ecu.edu.au

Professor Michelle Colgrave is known globally for her research in the food and agricultural domains. She is specifically recognised for her work in detecting gluten and other anti-nutritional proteins in food related to coeliac disease and non-coeliac gluten sensitivity. She is currently using mass spectrometry (MS) and proteomics to explore grain biology and help identify key proteins that will enhance agriculture and food industries and improve human health. Her research has already directly informed the development of food labelling policy in the United States.

Professor Colgrave has published over 100 scientific papers in prestigious journals including Nature Chemical Biology, PNAS and Plant Biotechnology Journal, and has given numerous plenary lectures at International Conferences. She is the editor of the book "Proteomics in Food Science: From Farm to Fork" aimed at introducing the application of MS and proteomics to the food science and agricultural research communities. She is a committee member of the Australasian Proteomics Society (APS) and on the organising committee for the Human Proteome (HUPO2019) conference. She is also currently the editor of a Special Issues in Frontiers in Plant Science.

Professor Colgrave has won many awards including 'Runner-up' in the Scopus "Women in Research Award" in 2017, the CSIRO Chairman's Medal in 2016, the Payne-Scott Award in 2014, the John Philip Award in 2012 and Julius Career Award in 2009.

SELECTED PUBLICATIONS

Books

- Colgrave, M.L. (2017) Proteomics in Food Science: From Farm to Fork. Elsevier Pty Ltd. San Diego, USA

Journal Articles

- Mylne, J.S., Colgrave, M.L., Daly, N.L., Chanson, A.H., Elliott, A.G., McCallum, E.J., Jones, A. & Craik, D.J. Albumins and their processing machinery are hijacked for cyclic peptides in sunflower. Nature Chemical Biology (2011) 7, 257-259
- Elliott, A.G., Delay, C. Liu, H., Phua, Z., Rosengren, K.J., Chanson, A.H., Colgrave, M.L., Panero, J.L., Schilling, E.E., Ortiz-Barrientos, D., Craik, D.J. & Mylne, J.S. Evolutionary origins of a bioactive protein buried within Preproalbumin. Plant Cell (2014) 26(3), 981-995
- Poth, A.G., Colgrave, M.L., Lyons, R.E., Daly, N.L. & Craik, D.J. Discovery of an unusual biosynthetic origin for circular proteins in legumes. PNAS (2011) 108(25), 10127-10132
- Colgrave*, M.L., Byrne, K., Blundell, M., Tanner, G.J. & Howitt, C.A. Comparing multiple reaction monitoring and sequential window acquisition of all theoretical mass spectra for the relative quantification of barley gluten in selectively-bred barley lines. Analytical Chemistry (2016) 88, 9127-9135
- Poth, A. G., Colgrave, M.L., Philip, R., Daly, N.L. & Craik, D.J. Discovery of cyclotides in the Fabaceae plant family provides new insights into the cyclisation, evolution and distribution of circular proteins. ACS Chemical Biology (2011) 6(4), 345-355

GRANTS

- 2017 Progressing the gluten detection technology. CSIRO Strategic Grant, $94,000
- 2009-2013 Discovery and applications of circular proteins. Australian Research Council, Discovery Grant, $1,280,000

Research Interests

- Proteomic studies of agriculturally important grains and crops
- The application of proteomics to detect allergens and anti-nutritional proteins
- Food safety assessment and the development of novel LC-MS methods

ASSOCIATE PROFESSOR MARY BOYCE

PhD, Grad Cert Ed, BSc (Hons)
Deputy Director, Centre for Integrative Metabolomics and Computational Biology
Email: m.boyce@ecu.edu.au

A/Prof Boyce is an analytical chemist with over 20 years of experience. Her research activity is in two distinct areas: research in the development of novel and improved methods of analysis; and applied research in collaboration with scientists from a broad range of disciplines.

She has considerable experience in the development and advancement of chromatographic techniques including capillary electrophoresis, and more recently liquid/gas chromatography coupled to mass spectrometry for metabolomics studies in both the clinical and environmental fields. Her analytical chemistry skills has seen her collaborate on a diverse range of projects including environmental exposure, wetland ecology and fish microbiome in the environmental area; exercise and dietary interventions, and gut health in the human health field; and bee health, sandalwood forestry management and truffle chemistry in the broadly agricultural field.

A/Prof Boyce is an experienced educator having received the Office of Learning and Teaching award for Sustained Excellence in Motivating, Inspiring and Influencing Science Students' learning (2015). She has supervised 8 PhD and 6 Masters by Research students to successful completion.

SELECTED PUBLICATIONS

Journal Articles

- Shafaei, A., Croft, K., Hodgson, J., Boyce, M.C. (2019) Simultaneous quantitative analysis of polyphenolic compounds in human plasma by UPLC-MS/MS. Journal of Separation Science.
- Abbiss, H., Maker, G.L., Gummer, J.P.A., Rawlinson, C., Musk, G.C., Fleming, P.A., Phillips, J.K., Boyce, M.C. & Trengove, R. (2019) Untargeted gas chromatography-mass spectrometry-based metabolomics analysis of kidney and liver tissue from the Lewis Polycystic Kidney rat. Journal of Chromatography B, Vol 1118-1119, 25-32.
- Boyce, M.C., Lawler, N.G. Yingqi, T. & Reinke, S. N. (2019) Introducing Undergraduate Students to Metabolomics Using Liquid Chromatography–High Resolution Mass Spectrometry Analysis of Horse Blood. Journal of Chemical Education, Vol 96, 745-750.
- Le, T.T., Shafaei, A., Genoni, A., Christophersen, C., Devine, D., Lo J., Lyons Wall, P., & Boyce, M.C. (2019). Development and validation of a simple LC-MS/MS method for the simultaneous quantitative determination of trimethylamine-N-oxide and branched chain amino acids in human serum. Analytical and Bioanalytical Chemistry, Vol 411, 1019-1028.
- Manaf, F.A., Lawler, N.G., Peiffer, J.J., Maker, G.L., Boyce, M.C., Fairchild, T.J., & Broadhurst, D. (2018). Characterizing the plasma metabolome during and following a maximal exercise cycling test. Journal of Applied Physiology, Vol 125, 1193-1203.
- Phelps, C., Boyce, M.C., and Huggett, M. (2017) Future climate change scenarios differentially affect three abundant algal species in southwestern Australia. Marine Environmental Research. Vol 126, 69-80.

GRANTS

- High resolution mass spectrometry for metabolomics and proteomics research, Australian Research Council, Grant - Linkage (Infrastructure), 2015 - 2016, $1,450,000.
- Chemistry/Proteomics, Chemistry Centre WA T/A ChemCentre, Research Fellowship Grant, 2017 - 2021, $470,000.
- ECU-Thermo Research Facility Manager, Thermo Fisher Scientific Australia Pty Ltd, Grant, 2017 - 2019, $267,603.

Research Interests

- Targeted LC-MS methodologies for nutrition, biological and environmental fields
- Extraction methodologies for complex biological tissues and plant samples
- SPME-GC-MS methodologies in the environmental fields
- Developing targeted and untargeted LC-MS workflows for lipid and metabolomic studies
- Sandalwood chemistry

DR ANGÉLA JUHÁSZ

PhD
Email: a.juhasz@ecu.edu.au

Dr Juhász is a computational biology analysis expert in cereal genomics and grain allergen research. She uses the tools of comparative genomics, transcriptomics and proteomics to describe the complex nature and expression profiles of grain proteins with immune response characteristics in agronomically important crop species. She is involved in various genome annotation works and has a significant role in the precise annotation of the grain allergens with a primary focus on the prolamin superfamily genes, the major contributors of gluten in wheat and related species.

Dr Juhasz is known for her research in wheat genomics and grain allergen research. She is the developer of the largest cereal prolamin database and epitope analysis tool. She is a member of the International Wheat Gneome Sequencing Consortium and the group leader of the Allergen subgroup of the Expert Working Group for Wheat Improvement for Processing and Health of the International Wheat Initiative.

Dr Juhasz has published her research in highly prestigious journals including Science Advances, Science, PNAS, Plant Journal and Scientific Reports. She regularly gives lectures as an invited speaker on International Conferences related to grain science. In 2019 she is the co-chair of the Grain Satellite Meeting of the Australian Society of Plant Scientists.

SELECTED PUBLICATIONS

Journal Articles

- Zhang, Y., Hu, X., Islam, S., She, M., Peng, Y., Yu, Z., Wylie, S., Juhasz, A., Dowla, M., Yang, R., Zhang, J., Wang, X., Dell, B., Chen, X., Nevo, E., Sun, D., Ma, W., (2018), New insights into the evolution of wheat avenin-like proteins in wild emmer wheat (Triticum dicoccoides). Proceedings of the National Academy of Sciences of USA, 115(52), 13312-13317, DOI: 10.1073/pnas.1812855115.
- Yang, R., Juhasz, A., Zhang, Y., Chen, X., Zhang, Y., She, M., Zhang, J., Maddern, R., Edwards, I., Diepeveen, D., Islam, S., Ma, W., (2018), Molecular characterisation of the NAM-1 genes in bread wheat in Australia. Crop and Pasture Science, 69(12), 1173-1181, DOI: 10.1071/CP18273.
- Eva, C., Szoke-Pazsi, K., Makai, S., Gell, G., Fabian, A., Poczkodi, E., Toth, G., Sagi, L., Tamas, L., Juhasz, A., (2018), In Vivo DNA Affinity Purification and Histone Deacetylase Inhibitor Treatment Proves the Role of Histone Acetylation in the Expression Regulation of High-Molecular-Weight Glutenin Genes. Plant Molecular Biology Reporter, 36(5-6), 750-763, DOI: 10.1007/s11105-018-1117-8.
- Alhabbar, Z., Yang, R., Juhasz, A., Xin, H., She, M., Anwar, M., Sultana, N., Diepeveen, D., Ma, W., Islam, S., (2018), NAM gene allelic composition and its relation to grain-filling duration and nitrogen utilisation efficiency of Australian wheat. PLoS One, 13(10), article no. e0205448, DOI: 10.1371/journal.pone.0205448.
- Keeble-Gagnère, G., ..., Juhasz, A., ..., Appels, R., (2018), Optical and physical mapping with local finishing enables megabase-scale resolution of agronomically important regions in the wheat genome. Genome Biology, 19(1), Article No. 112, DOI: 10.1186/s13059-018-1475-4.

GRANTS

- Non-responsive Coeliac Disease – Understanding the Grass Roots Cause for Gluten Free Diet Failure, Commonwealth Scientific and Industrial Research Organisation (CSIRO), CSIRO - Fellowship, 2020 - 2023, $381,361.
- Application of proteomics methods to monitor the ability of GluteGuard to detoxity ATIs, Edith Cowan University, ECU Industry Engagement Grant, 2019 - 2020, $112,397.

Research Interests

- Genomic characterization of immune-responsive proteins in cereal grains with a major focus on food allergies and coeliac disease
- Effect of environmental changes on allergen content and composition
- Genomic analysis and functional characterization of cereal prolamin-superfamily proteins
- Grain transcriptomics and proteomics
- Seed development programs and regulatory mechanisms of seed storage protein expression under various nutritional and stress conditions
- Bioinformatics
- Dough rheology, kernel hardness and cereal quality

DR STACEY REINKE

PhD, BSc
Email: stacey.n.reinke@ecu.edu.au

Stacey is a Senior Research Fellow with the Centre of Integrative Metabolomics & Computational Biology (CIMCB) in the School of Science. She received her PhD in Biochemistry from the University of Alberta (Canada, 2011) and held a Postdoctoral Fellowship, from the Canadian Institutes of Health Research, at the Karolinska Institute (Sweden) before being recruited to Perth in 2016. During her PhD and subsequent postdoctoral training, Stacey developed considerable expertise in the area of clinical and biomedical metabolomics, including biochemistry, analytical chemistry, large-scale cohort studies, statistics, and data science. She has applied these skills to several biological contexts, including mitochondrial and central energy dysfunction, neonatal asphyxia, neuroinflammation, and respiratory disease. Her current research focus is two-fold: applying metabolomics and systems biology approaches to inform disease mechanisms and biomarker discovery in early-life contexts, and enhancing the field of clinical and biomedical metabolomics through methodological advancement (high quality high-throughput workflows, quality assurance, data analysis).

Dr Reinke is an active member of the international Metabolomics Society, having served on the Board of Directors, the Early-career Members Network Committee, the Conference Committee, and International Organising Committee for the Annual Conference of the Metabolomics Society. In 2019, she was appointed to the Scientific Editorial Board of the journal Metabolomics.

SELECTED PUBLICATIONS

Journal Articles

- Boyce, M., Lawler, N., Tu, Y., Reinke, S., (2019), Introducing Undergraduate Students to Metabolomics Using Liquid Chromatography–High Resolution Mass Spectrometry Analysis of Horse Blood. Journal of Chemical Education, 96(4), 745-750, DOI: 10.1021/acs.jchemed.8b00625.
- Mendez, K., Pritchard, L., Reinke, S., Broadhurst, D., (2019), Toward collaborative open data science in metabolomics using Jupyter Notebooks and cloud computing. Metabolomics, 15(N/A), 125, DOI: 10.1007/s11306-019-1588-0.
- Reinke, S., Galindo-Prieto, B., Skotare, T., Broadhurst, D., Singhania, A., Horowitz, D., Djukanovic, R., Hinks, T., Geladi, P., Trygg, J., Wheelock, C., (2018), OnPLS-Based Multi-Block Data Integration: A Multivariate Approach to Interrogating Biological Interactions in Asthma. Analytical Chemistry, 90(22), 13400-13408, DOI: 10.1021/acs.analchem.8b03205.
- Broadhurst, D., Goodacre, R., Reinke, S., Kuligowski, J., Wilson, I., Lewis, M., Dunn, W., (2018), Guidelines and considerations for the use of system suitability and quality control samples in mass spectrometry assays applied in untargeted clinical metabolomic studies. Metabolomics, 14(6), article no.72, DOI: 10.1007/s11306-018-1367-3.
- Naz, S., Gallart-Ayala, H., Reinke, S., Mathon, C., Blankley, R., Chaleckis, R., Wheelock, C., (2017), Development of a Liquid Chromatography-High Resolution Mass Spectrometry Metabolomics Method with High Specificity for Metabolite Identification Using All Ion Fragmentation Acquisition. Analytical Chemistry, 89(15), 7933-7942, DOI: 10.1021/acs.analchem.7b00925.

GRANTS

- Active lung disease in survivors of preterm birth? Can we treat it?, National Health and Medical Research Council, Project Grants, 2018 - 2021, $79,000.

Research Interests

- Clinical and biomedical metabolomics
- Systems biology
- Personalised medicine

PROFESSOR GLENN HYNDES

PhD, BSc (Hons)
Email: g.hyndes@ecu.edu.au

Glenn's research focuses on marine ecology and fisheries science, specifically on the: (1) trophic connectivity within and between habitats in the marine environment; (2) interactions of fauna with coastal habitats, such as seagrass meadows and surf zones; and (3) fisheries interactions with the environment and management. His major focus on connectivity seeks to understand the importance of the movement of material from one habitat to another in coastal seascapes. This program is directed towards examining the movement of nutrients via detritus from reefs to seagrass meadows and detritus from reefs and seagrass meadows to surf zones and beaches. A large part of his research focuses on using stable isotopes as a tool for understanding ecological interactions, including enriched stable isotopes to test for flow of nutrients through food webs. More recently, he has focused on grazing pressure by herbivorous fishes in reef ecosystems, and the potential effects of tropical grazers moving into temperate seagrass meadows as a consequence of global ocean warming.

Glenn has published 70+ articles in ISI journals and been an investigator on research grants valued at >$7M. During that time, he has supervised 26 HDR students to completion, and is currently supervising 6 HDR students.

SELECTED PUBLICATIONS

Journal Articles

- Tarquinio, F., Hyndes, G.A., Laverock, B., Koenders, A., Säwström, C., (2019). The seagrass holobiont: understanding seagrass-bacteria interactions and their role in seagrass ecosystem functioning. FEMS Microbiology Letters 366, fnz057.
- Tarquinio, F., Bourgoure, J., Koenders, A., Laverock, B., Säwström, C., Hyndes, G.A. (2018). Microorganisms facilitate uptake of dissolved organic nitrogen by seagrass leaves. ISME Journal 12: 2796–2800.
- Olds, A., Vargas-Fonseca E., Connolly R.M., Gilby B.L., Huijbers C.M., Hyndes G.A., Layman, C., Whitfield, A., Schlacher T.A. (2018). The ecology of fish in the surf zones of ocean beaches: a global review. Fish and Fisheries 19: 78–89.P4
- Säwström C., Hyndes G.A., Eyre B.D., Huggett M.J., Fraser M.W., Lavery, P.S., Thomson P.G., Tarquinio F., Peter D. Steinberg P.D., (2016). Laverock B. Microbial-mediated connectivity in coastal seascapes: processes and future projections. Ecology and Evolution. 0: 1–10.
- Hyndes G.A., Heck K.L. Jr, Harvey E.S., Kendrick G.A., Lavery, P.S., McMahon K., Orth R., Pearce A., Vanderklift M.A., Verges A., Wernberg T., Whiting S., Wilson S. (2016). Accelerating tropicalization and the transformation of temperate seagrass meadows. BioScience 66: 938-948. P7
- Schlacher T.A., Lucrezi S., Connolly R.M., Peterson C.H., Gilby B.L., Maslo B., Olds A.D., Walker S.J., Leon J.X., Huijbers C.M., Weston M.A., Turra A., Hyndes G.A., Holt R.A., Schoeman D.S. (2016) Human threats to sandy beaches: A meta-analysis of ghost crabs illustrates global anthropogenic impacts. Estuarine, Coastal and Shelf Science 169: 56-73
- Hyndes, G.A., Nagelkerken I., McLeod, R.J., Connolly, R.M., Lavery, P.S. and Vanderklift, M.A. (2014). Mechanisms and ecological role of carbon transfer within coastal seascapes. Biological Reviews 89: 232-254.
- Hyndes, G., Lavery, P. and Doropoulos, C. (2012). Dual processes for cross-boundary subsidies: incorporation of nutrients from reef-derived kelp into a seagrass ecosystem. Marine Ecology Progress Series 445: 97-107.

GRANTS

- Integrated state-wide survey of recreational fishing Phase 2: boat- and shore based activity , Department of Primary Industries and Regional Development, Grant, 2015 - 2020, $3,761,142.

Research Interests

- Marine Ecology
- Fisheries biology
- Stable isotope ecology

PROFESSOR PAUL LAVERY

PhD
Director, Centre for Marine Ecosystem Research
Email: p.lavery@ecu.edu.au

Paul Lavery has over 30 years experience working in applied marine science. He has worked in the Government sector in Australia and the USA and on some of the major marine research projects in Australia and overseas, including the Peel-Harvey Management Programme, the Boston Harbor Cleanup Programme and the Perth Coastal Waters Study. He was a contracted expert assisting in the development of the State's first State Environmental Policy and has assisted in marine park planning through his involvement in several scientific reference groups. He was a member of the working group revising the ANZECC Water Quality Guidelines (biological monitoring). He is a past Head of School and Associate Dean of Research and Higher Degrees.

SELECTED PUBLICATIONS

Journal Articles

- Geraldi NR, Ortega A, Serrano O, Macreadie PI, Lovelock C, Krause-Jensen D, Kennedy HA, Lavery PS, Pace ML, Kaal J, Duarte CM (2019) Fingerprinting blue carbon: Rationale and tools to determine the source of organic carbon in marine depositional environments. Frontiers in Marine Science.
- Role of carbonate burial in "Blue Carbon" budgets. Saderne V, Geraldi NR, Macreadie PI, Maher DT, Middelburg JJ, Serrano O, Almahasheer H, Arias-Ortiz A, Cusack M, Eyre BD, Fourqurean J, Kennedy H, Krause-Jensen D, Kuwae T, Lavery P, Lovelock CE, Marba N, Masqué P, Mateo M-A, Mazarrasa I, McGlathery KJ, Oreska MPJ, Sanders CJ, Santos IR, Smoak JM, Tanaya T, Watanabe K and Duarte CM. (2019) Nature Communications
- Krause-Jensen D, Lavery P, Serrano O, Marbá N, Masqué P, Duarte CM (2018) Sequestration of macroalgal carbon: The elephant in the Blue Carbon room. Biology Letters 14: 20180236 doi.org/10.1098/rsbl.2018.0236
- Hernawan, U., Van Dijk, K., Kendrick, G., Feng, M., Biffin, E., Lavery, P., McMahon, K., (2017), Historical processes and contemporary ocean currents drive genetic structure in the seagrass Thalassia hemprichii in the Indo-Australian Archipelago. Molecular Ecology, 26(4), 1008-1021, UK, Wiley-Blackwell Publishing Ltd., DOI: 10.1111/mec.13966.
- Strydom, S., McMahon, K., Kendrick, G., Statton, J., Lavery, P., (2017), Seagrass Halophila ovalis is affected by light quality across different life history stages. Marine Ecology Progress Series, 572(2017), 103-116, Germany, Inter-Research, DOI: 10.3354/meps12105.
- Strydom, S., McMahon, K., Lavery, P., (2017), Response of the seagrass Halophila ovalis to altered light quality in a simulated dredge plume. Marine Pollution Bulletin, 121(1-2), 323-330, United Kingdom, Elsevier, DOI: 10.1016/j.marpolbul.2017.05.060.
- Lovelock, CE., Atwood, T., Baldock, J., Duarte, CM., Hickey, S., Lavery, P., Masque, P., Macreadie, PI., Ricart, AM., Serrano Gras, O., Steven, A., (2017), Assessing the risk of carbon dioxide emissions from blue carbon ecosystems. Frontiers in Ecology and the Environment, 15(5), 257-265, USA, John Wiley & Sons, DOI: 10.1002/fee.1491.

GRANTS

- Genetic diversity and resilience of estuarine seagrasses, Department of Water and Environmental Regulation (WA), Scholarships to Support Industry Engagement PhD Projects, 2018 - 2021, $55,500.
- RESEARCH TOPIC: Resilience of tropical seagrasses, University of Western Australia, McNamara World Heritage PhD Top-Up Scholarship, 2018 - 2020, $150,000.
- Pilot Malting Plant, Department of Primary Industries and Regional Development, Grant, 2010 - 2020, $415,000.

Research Interests

- Marine ecology and management (seagrass and estuarine ecosystems)
- The role and lifecycle of wrack in marine ecosystems
- Impacts of dredging on benthic marine ecosystems
- Carbon capture and storage in seagrass ecosystems
- The development of monitoring indicators and protocols for marine ecosystems

PROFESSOR PERE MASQUÉ

PhD
VC Professorial Chair
Email: p.masque@ecu.edu.au

Pere Masqué joined Edith Cowan University in 2015 from the Department of Physics and the Institute of Environmental Science and Technology at the Universitat Autònoma de Barcelona (Spain). His research focuses on the use of both natural and artificial radioactive isotopes as tracers of environmental processes, mostly in the oceans. Current working areas include the Mediterranean Sea, Atlantic, Antarctic and Arctic Oceans and coastal vegetated ecosystems worldwide. He serves as the president of the South Pacific Environmental Radoactivity Association (SPERA) and collaborates with the Technical Cooperation Department of the International Atomic Energy Agency.

SELECTED PUBLICATIONS

Journal Articles

- Paradis, S., Puig, P., Sanchez-Vidal, A., Masque, P., Garcia-Orellana, J., Calafat, A.M., Canals. M. (2018). Spatial distribution of sedimentation-rate increases in Blanes Canyon caused by technification of bottom trawling fleet. Progress in Oceanography, 169, 241-252.
- Marbà, N., Krause-Jensen, D., Masqué, P. and Duarte, C.M. (2018) Expanding Greenland seagrass meadows contribute new sediment carbon sinks. Scientific Reports, 8: 14024.
- Arias-Ortiz, A., Serrano, O., Masqué, P., Lavery, P.S., Mueller, U., Kendrick, G.A., Rozaimi, M., Esteban, A., Fourqurean, J.W., Marbà, N., Mateo, M.A., Murray, K., Rule, M. and Duarte, C.M. (2018). A marine heat wave drives massive losses from the world's largest seagrass carbon stocks. Nature Climate Change, 8, 338-344.
- Vives i Batlle, J., Aoyama, M., Bradshaw, C, Brown, J., Buesseler, Casacuberta, N., Christl, M., K.O., Duffa, C., Impens, N., Iosjpe, M., Masqué, P. and Nishikawa, J. (2018). Marine radioecology after the Fukushima Dai-ichi nuclear accident: are we better positioned to assess the impact of radionuclides in marine ecosystems? Science of the Total Environment, 618, 80-92.
- Buesseler, K.O., Dai, M., Aoyama, M., Benitez-Nelson, C., Charmasson, S., Higley, K., Maderich, V., Masque, P., Morris, P.J., Oughton, D. and Smith, J.N. (2017). Fukushima Daiichi-derived radionuclides in the Ocean: transport, fate, and impacts. Annual Review of Marine Science, 9, 173-203
- Roca-Martí, M., Puigcorbé, V., Rutgers van der Loeff, M., Katlein, C, Fernández-Méndez, M., Peeken, I. and Masqué, P. (2016). Carbon export fluxes and export efficiency in the central Arctic during the record sea-ice minimum in 2012. A joint 234Th/238U and 210Po/210Pb study. Journal of Geophysical Research, 121 (7), 5030-5049
- Rodellas, V., Garcia-Orellana, J., Masqué, P., Feldman, M. and Weinstein, Y. (2015). Submarine groundwater discharge: a major source of nutrients to the Mediterranean Sea. Proceedings of the National Academy of Sciences (PNAS), 112 (13), 3926-3930.
- Marbà, N., Arias-Ortiz, A., Masqué, P., Kendrick, G.A., Mazarrasa, I., Bastyan, G.R., Garcia-Orellana, J. and Duarte, C.M. (2015). Impact of seagrass loss and subsequent re-vegetation on carbon sinks and stocks. Journal of Ecology, 103(2), 296-302.

GRANTS

- 2017-2018 A multi-institutional environmental radioactivity research centre. ARC-Linkage Infrastructure, Equipment and Facilities. $885,000.
- 2018-2019. Reconstruction of historical bush fire time-series using black carbon in coastal marine sediments deposited from the King Edward River catchment. Western Australia Department of Biodiversity, Conservation and Attractions. $110,951.

Research Interests

- Ocean's role in global climate change as a source or sink of atmospheric CO2
- The impact of submarine groundwater discharge (SGD) on nutrient and trace metal biogeochemistry in the ocean
- Reconstruction of the historical patterns of climate, pollution and other natural and anthropogenically-driven processes

ASSOCIATE PROFESSOR KATHRYN MCMAHON

PhD. BSC (Hons)
Deputy Director, Centre for Marine Ecosystems Research
Email: k.mcmahon@ecu.edu.au

Kathryn is a Senior Lecturer in the School of Science and Deputy Director of the Centre for Marine Ecosystems Research. She teaches in the areas of environmental investigations and monitoring, coastal and marine management and origins and evolution of life. She is involved in research projects on understanding the impacts of human activities in seagrass ecosystems and the biology and ecology of these habitats. She is a member of the Australian Marine Sciences Association and the Coastal & Estuarine Research Federation.

SELECTED PUBLICATIONS

Book Chapters

- McMahon, K., Sinclair, EA., Sherman, CD., Van Dijk, K., Hernawan, UE., Verduin, J., Waycott, M., (2018), Genetic Connectivity in Tropical and Temperate Australian Seagrass Species. Seagrasses of Australia: Structure, Ecology and Conversation, 155-195, Switzerland, Springer, DOI: 10.1007/978-3-319-71354-0_6.
- Marsh, H., Creche, A., McMahon, K., (2018), Dugongs: Seagrass Community Specialists. Seagrasses of Australia: Structure, Ecology and Conversation, 629-661, Cham, Switzerland, Springer, DOI: 10.1007/978-3-319-71354-0_19.

Journal Articles

- Binks, RM., Byrne, M., McMahon, K., Pitt, G., Murray, K., Evans, RD., (2019), Habitat discontinuities form strong barriers to gene flow among mangrove populations, despite the capacity for long-distance dispersal. Diversity and Distributions, 25(2), 298-309, DOI: 10.1111/ddi.12851.
- Kendrick, GA., Nowicki, RJ., Olsen, YS., Strydom, S., Fraser, MW., Sinclair, EA., Statton, J., Hovey, RK., Thomson, JA., Burkholder, DA., McMahon, K., Kilminster, K., Hetzel, Y., Fourqurean, JW., Heithaus, MR., Orth, RJ., (2019), A Systematic Review of How Multiple Stressors From an Extreme Event Drove Ecosystem-Wide Loss of Resilience in an Iconic Seagrass Community. Frontiers in Marine Science, 6(na), 455, DOI: 0.3389/fmars.2019.00455.
- Pujol, D., Abdolahpour, M., Lavery, P., McMahon, K., Oldham, C., (2019), Flow velocity and nutrient uptake in marine canopies. Marine Ecology Progress Series, 622(na), 17-30, Germany, Inter-Research, DOI: https://doi.org/10.3354/meps12987.
- Wu, PP., Mergersen, K., Caley, MJ., McMahon, K., Rasheed, MA., Kendrick, GA., (2019), Analysing the dynamics and relative influence of variables affecting ecosystem responses using functional PCA and boosted regression trees: A seagrass case study. Methods in Ecology and Evolution, 10(na), 1723-1733, DOI: 10.1111/2041-210X.13269.
- Abdolahpour, M., Ghisalberti, M., McMahon, K., Lavery, P., (2018), The impact of flexibility on flow, turbulence, and vertical mixing in coastal canopies. Limnology and Oceanography, 63(6), 2777-2792, DOI: 10.1002/lno.11008..

GRANTS

- Conserving Critical Seagrass Habitat for Iconic Wildlife: An Integrated Assessment across the Pilbara, Department of Biodiversity, Conservation and Attractions WA, Scholarships to Support Industry Engagement PhD Projects, 2016 - 2021, $20,500.
- Genetic diversity and resilience of estuarine seagrasses, Department of Water and Environmental Regulation (WA), Scholarships to Support Industry Engagement PhD Projects, 2018 - 2021, $55,500.
- Keep Watch – Seagrass Health Monitoring 2017-2021, Geographe Catchment Council Inc, Grant - Geocatch, 2017 - 2021, $90,250.

Research Interests

- Human impacts and resilience in coastal ecosystems
- Connectivity and diversity in seagrass habitats
- Seagrass-grazing interactions

ASSOCIATE PROFESSOR UTE MUELLER

PhD, MSc, PGCert (HighEd)
Associate Dean Research
Email: u.mueller@ecu.edu.au

Ute Mueller is an applied mathematician with research interests in the application and development of geostatistical methods for applications in mining, and natural resources more generally. Most of her research is collaborative, with collaborators from ECU, research institutes and industry. Collaborators include staff from the Department of Fisheries, the Helmholtz Institute for Resources Technology Freiberg, the Canadian Geological Survey, and Geoscience Australia. Her current projects include the geostatistical modelling of data from geochemical surveys and the spatiotemporal characterisation of recreational fishing data.

SELECTED PUBLICATIONS

Journal Articles

- Talebi, H, Mueller, U, Tolosana-Delgado, R, van den Boogaart, KG (2019) Geostatistical Simulation of Geochemical Compositions in the Presence of Multiple Geological Units: Application to Mineral Resource Evaluation, Mathematical Geosciences, 51(2), 129-153, DOI:10.1007/s11004-018-9763-9
- Tolosana-Delgado, R., Mueller, U. and van den Boogaart, K.G. (2019) Geostatistics for Compositional Data: An Overview Mathematical Geosciences 51: 485. https://doi.org/10.1007/s11004-018-9769-3
- Talebi, H. Mueller, U. Tolosana-Delgado,R (2019) Joint simulation of compositional and categorical data via direct sampling technique – Application to improve mineral resource confidence, Computers & Geosciences,122: 87-102,DOI:10.1016/j.cageo.2018.10.013
- Lai, E., Mueller, U., Hyndes, G., Ryan, KL., (2019), Comparing estimates of catch and effort for boat-based recreational fishing from aperiodic access-point surveys. Fisheries Research, 219 105305, DOI: 10.1016/j.fishres.2019.06.003
- Talebi, H., Mueller, U., Tolosana-Delgado, R. et al. Surficial and Deep Earth Material Prediction from Geochemical Compositions (2019) Nat Resources Research 28: 869. https://doi.org/10.1007/s11053-018-9423-2
- Van Den Boogaart, KG., Mueller, U., Tolosana Delgado, R., (2017), An Affine Equivariant Multivariate Normal Score Transform for Compositional Data. Mathematical Geosciences, 49(2), 232-251, Springer, DOI: 10.1007/s11004-016-9645-y
- Grunsky,E.C. de Caritat,P. Mueller,U. (2017) Using surface regolith geochemistry to map the major crustal blocks of the Australian continent, Gondwana Research, 46: 227-239, DOI:10.1016/j.gr.2017.02.011
- Aidoo, E., Mueller, U., Hyndes, G., Ryan, K., (2016), The effects of measurement uncertainty on spatial characterisation of recreational fishing catch rates. Fisheries Research, 181(1), 1-13, Elsevier B.V., DOI: 10.1016/j.fishres.2016.03.022

GRANTS

- Integrated state-wide survey of recreational fishing Phase 2: boat- and shore based activity , Department of Primary Industries and Regional Development, Grant, 2015 - 2020, $3,761,142.
- CodaBlockCoEstimation, Edith Cowan University, Australia-Germany JRC Scheme (UA-DAAD), 2016 - 2018, $19,000.
- Boat -based recreational boat fishing activity in Western Australia: a long term profile, Department of Primary Industries and Regional Development, Grant, 2010 - 2015, $2,407,195.

Research Interests

- Geostatistics
- Spatiotemporal modelling
- Compositional data analysis

ASSOCIATE PROFESSOR CHANDRA P. SALGADO KENT

PhD, MSc, BSc
Email: c.salgadokent@ecu.edu.au

Assoc. Prof Chandra Salgado Kent has dedicated her work to marine wildlife research and conservation over the last twenty years. Her area of expertise includes data science in marine ecology, habitat modelling of marine mammals, population assessment, the impacts of human activities on the marine wildlife, and the application of scientific knowledge to conservation. She has been on a range of national and international scientific and government panels assessing the current status of whales and dolphins and the establishment of marine parks; such as the Scientific Committee of the International Whaling Commission (IWC) and the Camden Sound Marine Park Expert Panel. She has authored/co-authored over 50 peer reviewed scientific papers, 80 technical reports, and over 40 conference presentations. She has been a lead scientist in several large industry & community-based citizen science projects that use technologies to facilitate data collection for the conservation and management of marine wildlife.

SELECTED PUBLICATIONS

Journal Articles

- Gibbs, S., Salgado Kent, C., Slat, B., Morales, D., Foudra, L., Reisser, J. 2019. Cetaceans in the Great Pacific Garbage Patch. Marine and Freshwater Research.
- Marley, S., Salgado Kent, C.P., Erbe, C. and Parnum, I. 2017. Effects of vessel traffic and underwater noise on the movement, behaviour and vocalisations of bottlenose dolphins in an urbanised estuary. Scientific Reports. DOI:10.1038/s41598-017-13252-z.
- Parsons, M.J.G., Salgado Kent, C.P., Marley, S., McCauley, R.D. 2016. Characterizing diversity and variation in fish choruses in the Darwin Harbour, ICES Journal of Marine Science, 73 (8): 2058-2074
- Paiva, E. G., Salgado-Kent, C., Gagnon, M. M., McCauley, R, and Finn, H. 2015. Reduced Detection of Indo-Pacific Bottlenose Dolphins (Tursiops aduncus) in an Inner Harbour Channel During Pile Driving Activities. Aquatic Mammals 2015, 41(4), 455-468, DOI 10.1578/AM.41.4.2015.455.
- Osterrieder, S.K., Salgado Kent, C., Anderson, C.J.R., Parnum, I.M., and Robinson, R.W. 2015. Whisker spot patterns: a non-invasive method of individual identification of Australian sea lions (Neophoca cinerea). Journal of Mammalogy: 1-10.
- Bouchet, P., Meeuwig, J., Salgado Kent, C., Letessier, T., Jenner, C. 2015. Topographic determinants of mobile vertebrate predator hotspots: current knowledge and future directions. Biological Reviews. 90(3) DOI: 10.1111/brv.12130.
- Recalde-Salas, A., Salgado Kent, C.P., Parsons, M.J.G., Marley, S.A., and McCauley, RD. 2014. Non-song vocalizations of pygmy blue whales in Geographe Bay, Western Australia. Journal of the Acoustical Society of America. 135(5). Doi:10.1121/1.4871581.
- Salgado Kent, C.P., Jenner, C., Jenner, M. Bouchet, P., and Rexstad, E. 2012. Southern Hemisphere Breeding Stock 'D' Humpback Whale Population Estimates from North West cape, Western Australia. Journal of Cetacean Research and Management. 12(1): 29-38.

GRANTS

- BRAHSS 2010-2015 (>$6 Mil project) – Behavioural Response of Australian Humpback Whales to Seismic Surveys (co-investigator)
- APPEA 2014-2015 ($112 k)– Review and evaluate research over the past 10 years in Australia on Underwater Sound and Vibration from Offshore Petroleum Activities and its Potential Effects on Marine Fauna (PI)
- Dolphin Watch 2016-ongoing (~$90 k): a citizen science research program on bottlenose dolphins in the Swan River (Principle investigator)

Research Interests

- Data science in the area of marine ecology
- Marine mammal ecology and behaviour (including vocalisation)
- Impacts of human activities on marine fauna (including marine debris [plastics], underwater noise, industry activities & tourism, etc.).
- Marine wildlife habitat, ecological and behavioural modelling
- Conservation and marine protected areas

PROFESSOR RAY FROEND

PhD, BSc (Hons)
Email: r.froend@ecu.edu.au

Ray Froend is a Professor in Applied Ecology in the Centre for Ecosystem Management and Associate Dean of Science. Ray's research focuses on the ecology of plant-water interactions, ecophysiology of phreatophytic plants, water requirements of groundwater dependent ecosystems and ecohydrology. He leads a research group recognised for work on impacts of altered groundwater regimes on wetland and terrestrial vegetation. Ray advises natural resource agencies in Australia and internationally on groundwater dependent ecosystems and his research continues to inform the identification and protection of groundwater dependent ecosystems.

SELECTED PUBLICATIONS

Book Chapters

- Froend, R., Horwitz, P., Sommer, B., (2018), Groundwater Dependent Wetlands Ecosystems. The Wetland Book II: Distribution, Description, and Conservation, 2(24), 335-355, Dordrecht, Springer.
- Froend, R., Horwitz, P., (2018), Groundwater Dependent Wetlands. The Wetland Book I: Structure and Function, Management, and Methods, 1(159), 1149-1154, Dordrecht, Springer.
- Catford, JA., Roberts, J., Capon, SJ., Froend, R., Windecker, SM., Douglas, MM., (2017), Wetland Vegetation of Inland Australia. Australian Vegetation, 490-515, Cambridge, UK, Cambridge University Press.

Journal Articles

- Muler, A., Canham, C., Van Etten, E., Stock, W., Froend, R., (2018), Using a functional ecology approach to assist plant selection for restoration of Mediterranean woodlands. Forest Ecology and Management, 428(15 September 2018), 1-10, DOI: 10.1016/j.foreco.2018.04.032.
- Froend, R., Pettit, N., (2018), How important is groundwater availability and stream perenniality to riparian and floodplain tree growth?. Hydrological Processes, 32(10), 1502-1514, DOI: 10.1002/hyp.11510.
- Ruthrof, K., Breshears, D., Fontaine, J., Froend, R., Matusick, G., Kala, J., Miller, B., Mitchell, P., Wilson, S., Van Keulen, M., Enright, N., Law, D., Wernberg, T., Hardy, G., (2018), Subcontinental heat wave triggers terrestrial and marine, multi-taxa responses. Scientific Reports, 8(1), article no.13094, Springer Nature, DOI: 10.1038/s41598-018-31236-5.
- Muler, A., Van Etten, E., Stock, W., Howard, K., Froend, R., (2018), Can hydraulically redistributed water assist surrounding seedlings during summer drought?. Oecologia, 187(3), 625-641, DOI: 10.1007/s00442-018-4158-7.
- Rohde, M., Froend, R., Howard, J., (2017), A Global Synthesis of Managing Groundwater Dependent Ecosystems Under Sustainable Groundwater Policy. Ground Water, 55(3), 293-301, DOI: 10.1111/gwat.12511.

GRANTS

- TERN OzFlux - Ecosystem Processes - carbon, water and energy balances of Banksia woodland, Department of Education and Training, National Collaborative Research Infrastructure Strategy (NCRIS) Terrestrial Ecosystem Research Network (TERN) Project, 2019 - 2023, $373,928.
- Environmental monitoring and investigations for the Gnangara and Jandakot Mounds – Gnangara wetlands vegetation monitoring, Department of Water and Environmental Regulation (WA), Tender, 2019 - 2020, $37,043.
- Environmental monitoring and investigations for the Gnangara and Jandakot Mounds – Jandakot wetlands vegetation monitoring, Department of Water and Environmental Regulation (WA), Tender, 2019 - 2020, $21,833.

Research Interests

- Hydroecology
- Management of aquatic and groundwater dependent ecosystems
- Groundwater dependent vegetation
- Ecology and biology of wetland plants

PROFESSOR PIERRE HORWITZ

PhD, BSc(Hons)
Director, Centre for Ecosystem Management
Email: p.horwitz@ecu.edu.au

Professor Horwitz has research interests and expertise in the links between ecosystems, health and sustainability, and his work has made an impact at local, state, national and international levels. His work on southern Australian wetlands has led to understandings of, and policy responses to, natural resource management and climate change. The research highlights the impact of drought, drying and cracking anaerobic sediments, resulting in a myriad of effects that ultimately have human exposure consequences: the acidification of waterways and heavy metal mobilisation in groundwater, fire in wetland peats and the health effects of peat smoke. Professor Horwitz's work on ecosystem approaches and human health has been directed towards policy guidance for international conventions (the Ramsar Convention on Wetlands, Convention on Biological Diversity and World Health Organisation). He was a Theme Convenor (Wetlands and Human Health) for the Ramsar Convention (for the period 2009-2015). Some of his recent research has focused on the roles of narratives and metrics for sense of place, and for the useability of greenspaces in urban landscapes, drawing on cultural ecosystem services as a framing device; the work has application in areas of urban renewal, ecosystem restoration, and peri-urban landscape planning.

SELECTED PUBLICATIONS

Journal Articles

- Dandy, J., Horwitz, P., Campbell, R., Drake, D., and Leviston, Z. (2019). Leaving home: Place attachment and decisions to move in the face of environmental change. Regional Environmental Change 19(2), 615-620. https://doi.org/10.1007/s10113-019-01463-1
- Wooltorton, S., Collard, L. and Horwitz, P. (2018). Living water: Groundwater and wetlands in Gnangara, Noongar boodjar [online]. PAN: Philosophy Activism Nature, No. 14: 5-23.
- Huggett, M.J., Kavazos, C.R.J., Bernasconi R., Czarnick, R. and Horwitz, P. (2017). Origin, environment, and novel hydrology shape distinctive inland saline bacterioplankton communities in northwestern Australia. FEMS Microbiology Ecology 93(6).
- Jenkins, A., Horwitz, P., & Arabena, K. (2018). My island home: place-based integration of conservation and public health in Oceania. Environmental Conservation, 45(2), 125-136.
- Carter, M., Horwitz, P. (2014). Beyond proximity: The importance of green space useability to self-reported health. EcoHealth 11, 322–332.
- Horwitz, P. and Finlayson, C.M. (2011). Wetlands as settings: using ecosystem services and health impact assessment for wetland and water resource management. BioScience 61: 678-688.
- Parkes, M. and Horwitz, P. (2009).Water, Ecology and Health. Ecosystems as 'settings' for health and sustainability. Health Promotion International 24: 94-102.
- Horwitz, P., Bradshaw, D., Hopper, S.D., Davies, P.M., Froend, R. and Bradshaw, F. (2008). Hydrological change escalates risk of ecosystem stress in Australia's threatened biodiversity hotspot. Journal of the Royal Society of Western Australia 91: 1-11.

GRANTS

- WISH Fiji-Securing health in Fiji through strengthened health systems and integrated water management to tackle the Three Plagues: typhoid, dengue and leptospirosis. Department of Foreign Affairs and Trade. $375,179
- Predicting and Managing the Impacts of Wildfire and Prescription Burns on Water Quality and Water-Related Assets. Water Corporation (Western Australia). $1,587,150.

Research Interests

- Wetland ecology
- Sense of place
- Ecosystem approaches to human health
- Fire and water quality
- Sustainable natural resource management

PROFESSOR ANGUS MORRISON-SAUNDERS

PhD
Email: a.morrison-saunders@ecu.edu.au

Angus Morrison-Saunders specialises in environmental impact assessment and its contribution to sustainable development. His teaching and research revolve around the translation of policies, legislation and administrative practices into environmental and/or sustainability behaviours and outcomes with a particular focus upon the role of impact assessment. Sustainable mining and tourism are also research interests. He is a long term member of the International Association for Impact Assessment and has held roles as editor of leading impact assessment journals.

SELECTED PUBLICATIONS

Books

- Morrison-Saunders A (2018) Advanced Introduction to Environmental Impact Assessment, Cheltenham: Edward Elgar.

Journal Articles

- Morrison-Saunders A, M Hughes, J Pope, A Douglas and J-A Wessels (2019) Understanding visitor expectations for responsible tourism in an iconic national park: differences between local and international visitors, Journal of Ecotourism, 18(3): 284–294.
- Chanchitpricha C, A Morrison-Saunders and A Bond (2019) Investigating the Effectiveness of Strategic Environmental Assessment in Thailand Impact Assessment and Project Appraisal, 37(3-4): 356–368.
- Pinto, E, A Morrison-Saunders, A Bond, J Pope and F Retief (2019), Distilling and Applying Criteria for Best Practice EIA Follow-Up, Journal of Environmental Assessment Policy and Management, 32pp. [1950008-1 – 1950008-32] DOI: 10.1142/S146433321950008X [https://doi.org/10.1142/S146433321950008X]
- de Witt M, J Pope, F Retief, A Bond, A Morrison-Saunders and C Steenkamp (2019) Biodiversity offsets in EIA: Getting the timing right, Environmental Impact Assessment Review 75: 1–12.
- Rosa J, L Sanchez and A Morrison-Saunders (2018) Getting to "agreed" post-mining land use - An ecosystem approach Impact Assessment and Project Appraisal, 36:3, 220–229
- Pope, J., A. Bond, C. Cameron, F. Retief and A. Morrison-Saunders (2018), Are current effectiveness criteria fit for purpose? Using a controversial strategic assessment as a test case, Environmental Impact Assessment Review, 70: 34–44
- Wessels, J-A, R Mostert and A Morrison-Saunders (2018) Occupation to Profession: The Need, Drivers and Course of Action for Regulating the South African Environmental Control Officer Industry, Journal of Environmental Assessment Policy and Management, 20(4): (28 pages), http://dx.doi.org/10.1142/S1464333218500114

Research Interests

- Efficacy and effectiveness of environmental impact assessment (EIA) procedures and practice
- Applications of strategic environmental assessment (SEA) and sustainability assessment
- EIA follow-up and adaptive environmental management
- Environmental education to promote environmentally appropriate behavioural change
- Mine closure planning and sustainable post-mining land-use

ASSOCIATE PROFESSOR ANNETTE KOENDERS

PhD
Email: a.koenders@ecu.edu.au

Annette Koenders is an Associate Professor and Course Coordinator for Y39 BSc (Environmental Management) and Beijing University of Agriculture Program Coordinator at Edith Cowan University in the School of Science. Annette is a conservation biologist with research interests in biogeography and molecular evolution, conservation and authentic learning. Annette leads research on molecular evolution and taxonomy in the School. Her primary research focus is on invertebrate fauna, environmental DNA and metabolomics. Annette contributes to the teaching program of the School in molecular biology, biochemistry, genetics and evolution and animal physiology. Annette also contributes to the University as an active member of selected committees, including Academic Board.

SELECTED PUBLICATIONS

Journal Articles

- Lette MD, Lawler NG, Burnham QF, Boyce MC, Duffy R, Koenders A, Broadhurst DI. (in press) Metabolomic profiling of marron haemolymph uncovers phenotypic differences between Cherax tenuimanus and Cherax cainii. Freshwater Crayfish
- Koenders A.E., Schoen,I., Halse,S., Martens,K. (2016). Valve shape is not linked to genetic species in the Eucypris virens (Ostracoda, Crustacea) species complex. Zoological Journal of the Linnean Society. 11p. doi:10.1111/zoj.12488
- Shearn, R, Schoen I, Martens K, Halse, S, Krawiec J, Koenders, A (2017) Patterns of genetic divergence in the Ilyodromus amplicolis lineage (Crustacea, Ostracoda), with descriptions of three new species. Zootaxa 4318: 001-046. DOI: http://dx.doi.org/10.11646/zootaxa.4318.1.1
- Byrne, M., Koenders, A.E., Rogerson, K., Sampson, J., Van Etten, E.J. (2016). Genetic and morphological analysis of multi-stemmed plants of tuart (Eucalyptus gomphocephala). Australian Journal of Botany. 64 ((8): 704-714.
- Bernasconi R, Stat M, Koenders A, Paparini A, Bunce M, Huggett MJ. (2019) Establishment of coral-bacteria symbioses reveal changes in the core bacterial community with host ontogeny. Frontiers in Microbiology 10: 1529. DOI: https://www.10.3389/fmicb.2019.01529
- Perina G, Huey J., Horwitz P, Koenders A, Camacho AI. (2019) New Bathynellidae (Crustacea) taxa and their relationships in the Fortescue catchments aquifers of the Pilbara region, Western Australia. Systematics and Biodiversity 17, 148-164. DOI: https://doi-org.ezproxy.ecu.edu.au/10.1080/14772000.2018.1559892
- Tarquinio F, Bougoure J, Koenders A, Laverock B, Sawstrom C, Hyndes GA (2018) Microorganisms facilitate uptake of dissolved organic nitrogen by seagrass leaves. The ISME Journal DOI: http://dx.doi.org/10.1038/s41396-018-0218-6
- Knapp,C., Callan,A.C., Aitken,B., Shearn,R.J., Koenders,A.E., Hinwood,A. (2016). "Relationship between antibiotic resistance genes and metals in residential soil samples from Western Australia". Environmental Science and Pollution Research. 24 ((3): 2484-2494.

Research Interests

- Conservation biology
- Phylogeography
- Environmental DNA for species detection
- Metabolomics of reproduction in invertebrates

ASSOCIATE PROFESSOR MARK LUND

PhD, BSc (Hons)
Email: m.lund@ecu.edu.au

Mark Lund began his career in wetlands research after completing my biology degree at Murdoch University in 1987. He completed his Ph.D. in 1993 at Murdoch with Dr Jenny Davis, researching the ecology and rehabilitation of Lake Monger (a large eutrophic urban wetland in Perth).

In 1993, Mark commenced at Edith Cowan University and is currently a tenured Associate Professor in the School of Science. Mark was Head of the School of Natural Sciences (2006-2012), Program Leader for Biological Remediation in the Centre for Sustainable Mine Lakes (a State Government Centre of Excellence 2004 to 2009), and is now the Principal of the Mine Water and Environment Research Centre. Mark has chaired or co-chaired two Australian Society for Limnology conferences (Margaret River and Mandurah), and the International Mine Water Association Congress in Bunbury in 2012.

He has been awarded 17 nationally-competitive grants from the Australian Coal Association Research Program (ACARP), Australian Research Council (ARC), and Land and Water Australia worth over $3.1 M, as well as industry grants (e.g., Mining companies, city councils, government departments) worth over $2.7 M. Mark has published 75 peer reviewed papers, conference proceedings and book chapters, and 80 reports and articles.

SELECTED PUBLICATIONS

Journal Articles

- Blanchette, M.L.; Lund, M.A. (2016) Pit lakes are a global legacy of mining: An integrated approach to achieving sustainable ecosystems and value for communities. Current Opinion in Environmental Sustainability 23, 28-34.
- Kumar, N.R.; McCullough, C.D., Lund, M. & Larranga, S.A. (2016) Assessment of factors limiting algal growth in acidic pit lakes - A case study from Western Australia, Australia. Environmental Science and Pollution Research 23(6), 5915-5924.
- Galeotti, D.; Castalanelli, M.; Groth, D.; McCullough, C. & Lund, M. (2015). Geneotypic and Morphological Variation between Galaxiella nigrostriata (Galaxiidae) Populations: Implications for Conservation. Marine and Freshwater Research 66(2), 187-194
- van Etten, E.; McCullough, C. & Lund, M. (2014). Setting goals and choosing appropriate reference sites for restoring mine pit lakes as aquatic ecosystems: case study from south west Australia. Mining Technology 123: 9-19.
- Kumar, R. N.; McCullough, C. & Lund, M. (2013). Upper and Lower Concentration Thresholds for Bulk Organic Substrates in Bioremediation of Acid Mine Drainage. Mine Water and the Environment 1-8.
- McCullough, C. D. & Lund, M. A. (2011). Bioremediation of acidic and metalliferous drainage (AMD) through organic carbon amendment by municipal sewage and green waste. Journal of Environmental Management. 82: 2,419-2,426.

GRANTS

- $286,040 Australian Coal Association Research Program (ACARP)/Ulan Coal (Glencore), Yarrabee (Yancoal) Towards closure of saline pit lakes: Understanding biophysical processes for condition assessment and remediation. 2018-2020
- $312,293 Australian Coal Association Research Program (ACARP)/Ulan Coal (Glencore), Ashton Coal (Yancoal) Developing an alternative to the use of reference sites for setting criteria for closure of river diversions 2016-2017
- $441,714 Australian Coal Association Research Program (ACARP)/Premier Coal/Griffin Coal Coal pit lakes closure by river flow through: Risks and Opportunities 2014-2017

Research Interests

- Closure and ecology of mine pit lakes
- Ecology, assessment and management of mine waters
- Rehabilitation of wetlands
- Treatment and management of acid mine drainage and acid sulfate soils
- Wetland ecology and management

DR LEISA ARMSTRONG

PhD, MSc, GCert TerTeach, BSc
Email: l.armstrong@ecu.edu.au

Dr Leisa Armstrong is a Senior Lecturer in the computer science discipline within the School of Science. She is the leader of the eAgriculture Research Group, a member of Centre for Environmental Management, and the Centre for Innovative Practice. She has expertise in computer science, agriculture and environmental sciences and brings a multidisciplinary approach to her research. She has been focused on computer science related research in the area of agriculture, medical, education and tourism based industries, and the application of these technologies to solve real world problems. Before joining ECU, she worked as analyst programmer on a number of projects for WA state government, as well as owned a computer software consultancy company. She has also worked at a number of universities in Western Australia and Queensland as a lecturer in computing, agricultural and biological sciences.

SELECTED PUBLICATIONS

Journal Articles

- Thavorntam, W., Tantemsapya N. and Armstrong L. J (2015) A Combination Of Meteorological And Satellite Based Drought Indices In A Better Drought Assessment And Forecasting In Northeast Thailand. Natural Hazards Journal
- Babatunde, O., Armstrong, L., Leng, J., & Diepeveen, D. (2015). A Survey Of Computer-Based Vision Systems For Automatic Identification Of Plant Species. Journal of Agricultural Informatics; 6(1), 61-71.
- Babatunde, O., Armstrong, L., Leng, J., & Diepeveen, D. (2015). Comparative Analysis Of Genetic Algorithm and Particle Swam Optimization: An Application In Precision Agriculture. Asian Journal of Computer And Information Systems, 3(1), 1-12.
- Babatunde, O., Armstrong, L., Leng, J., & Diepeveen, D. (2015). A Computer-Based Vision System For Automatic Identification of Plant Species Using KNN and Genetic PCA. Journal of Agricultural Informatics.
- Sazzad, T., Armstrong, L., Tripathy, A., (2017), An automated ovarian tissue detection approach using type P63 non-counter stained images to minimize pathology experts observation variability. 2016 IEEE EMBS Conference on Biomedical Engineering and Sciences (IECBES), 155-159, online only, Institute of Electrical and Electronics Engineers, Inc., DOI: 10.1109/IECBES.2016.7843434.
- Armstrong, L., Diepeveen, D., Tantisantisom, K., (2010), An eAgriculture-based Decision Support Framework for Information Dissemination. International Journal of Human Capital and Information Technology Professionals (IJHCITP), 1(4), 1-13, United States, DOI: 10.4018/jhcitp.2010100101.
- Armstrong L.J. & Nallan S.A. (2016) Agricultural Decision Support Framework for Western Australian Crop Production. Proceedings of the 10th INDIACom 2016; and 3rd IEEE 2016 International Conference on "Computing For Sustainable Global Development",16th –18th March, 2016, New Delhi (INDIA).
- Sazzad, T., Armstrong, L., Tripathy, A., (2017), An automated ovarian tissue detection approach using type P63 non-counter stained images to minimize pathology experts observation variability. 2016 IEEE EMBS Conference on Biomedical Engineering and Sciences (IECBES), 155-159, online only, Institute of Electrical and Electronics Engineers, Inc., DOI: 10.1109/IECBES.2016.7843434.

GRANTS

- Digital methods for decision making when using semi-autonomous machinery in Australian agriculture, Department of Primary Industries and Regional Development, Scholarships to support Industry Engagement PhD projects, 2018 - 2023, $17,500.
- Digital methods for decision making when using semi-autonomous machinery in Australian Agriculture, Department of Jobs, Tourism, Science and Innovation, WA Science Industry PhD Fellowship Program, 2020 - 2022, $30,000.

Research Interests

- Digital Agriculture
- Image Processing
- Geospatial Technologies
- eLearning Technologies

DR DAVID BLAKE

PhD
Email: d.blake@ecu.edu.au

Dr Blake's expertise lies in the application of Geographic Information Systems (GIS) and Remote Sensing technologies to the study of environmental issues. Early work focused on the modelling of environmental factors and air quality. Over the past decade, Dr Blake's research interests have expanded to encompass a range of environmental management issues including peat fires, fire and water resource protection, agricultural, population health, urban and regional development, and spatial modelling of fire related impacts on the landscape. Dr Blake's current projects include evaluation of high temporal resolution geostationary satellite data to measure air quality; developing geospatial models of post-fire erosion potential in drinking water catchments; evaluation of UAV technologies for mammal counts in remote areas; and the use of UAV technologies to measure evapotranspiration rates in forested areas.

SELECTED PUBLICATIONS

Book Chapters

- Perkins, T., Blake, D., 2016. Understanding Cycling Behaviour in Boomtown Perth, in: Biermann, S., Olaru, D., Paul, V. (Eds.), Planning Boomtown and Beyond. UWA Publishing, Crawley, Western Australia, pp. 331–356.

Journal Articles

- Zijlema, W. L., Stasinska, A., Blake, D., Dirgawati, M., Flicker, L., Yeap, B. B., Heyworth, J. (2019). The longitudinal association between natural outdoor environments and mortality in 9218 older men from Perth, Western Australia. Environment International, 125, 430-436. doi:https://doi.org/10.1016/j.envint.2019.01.075
- Vitelli, F., Hyndes, G. A., Saunders, B. J., Blake, D., Newman, S. J., & Hobbs, J.-P. A. (2019). Do ecological traits of low abundance and niche overlap promote hybridisation among coral-reef angelfishes? Coral Reefs. Doi:10.1007/s00338-019-01816-6
- Sowden, M., Mueller, U., & Blake, D. (2018). Review of surface particulate monitoring of dust events using geostationary satellite remote sensing. Atmospheric Environment, 183, 154-164. doi:https://doi.org/10.1016/j.atmosenv.2018.04.020
- Radley, P., Davis, R., Dekker, R., Molloy, S., Blake, D., & Heinsohn, R. (2018). Vulnerability of megapodes (Megapodiidae, Aves) to climate change and related threats. Environmental Conservation, 45(4), 396-406. doi:10.1017/S0376892918000152
- Dirgawati, M., Heyworth, J. S., Wheeler, A. J., McCaul, K. A., Blake, D., Boeyen, J., Hinwood, A. (2016). Development of Land Use Regression models for particulate matter and associated components in a low air pollutant concentration airshed. Atmospheric Environment, 144, 69-78. doi:https://doi.org/10.1016/j.atmosenv.2016.08.013
- Boeyen, J., Callan, A. C., Blake, D., Wheeler, A. J., Franklin, P., Hall, G. L., Hinwood, A. (2017). Investigating the relationship between environmental factors and respiratory health outcomes in school children using the forced oscillation technique. International Journal of Hygiene and Environmental Health, 220(2, Part B), 494-502. doi:https://doi.org/10.1016/j.ijheh.2017.01.014
- Blake, D., Lu, K., Horwitz, P., & Boyce, M. C. (2012). Fire suppression and burnt sediments: effects on the water chemistry of fire-affected wetlands. International Journal of Wildland Fire, 21(5), 557-561. doi:https://doi.org/10.1071/WF10125
- Blake, D., Hinwood, A. L., & Horwitz, P. (2009). Peat fires and air quality: Volatile organic compounds and particulates. Chemosphere, 76(3), 419-423. doi:https://doi.org/10.1016/j.chemosphere.2009.03.047

Research Interests

- Cross discipline application of Geographic Information Systems (GIS) and Remote Sensing technologies.
- Spatial Ecology (Climate change and population distribution)
- Environment and Human Health (Population health)
- Geospatial modelling
- Fire, air and water quality

DR ROBERT DAVIS

PhD
Email: r.davis@ecu.edu.au

Rob's prime research interests are wildlife ecology, threatened species recovery, island ecosystems and disturbance ecology including fire, climate change and other impacts on fauna and their habitats. After many years of running his own fauna consultancy business in a past career, Rob is comfortable working on all animal groups to address ecological questions of importance. He aims to address the ongoing decline of biodiversity by applied research to address knowledge gaps.

SELECTED PUBLICATIONS

Journal Articles

- Doherty, T., Davis, R.A., van Etten, E., Algar, D., Collier, N., Dickman, C.R., Edwards, G., Masters, P., Palmer, R. and Robinson, S. (2015). A continental-scale analysis of feral cat diet in Australia. Journal of Biogeography. 42: 964-975.
- Davis, R.A., Gole, C. and Roberts, J.D. (2013). Impacts of urbanisation on the native avifauna of Perth, Western Australia. Urban Ecosystems. 16: 427-452.
- Dornelas M, Antão LH, Moyes F, et al. including Davis, R.A. (2018). BioTIME: A database of biodiversity time series for the Anthropocene. Global Ecology and Biogeography. 27:760-786.
- Doherty, T., Bengsen, A., Davis, R.A. (2014). A critical review of feral cat habitat use and key directions for future research and management. Wildlife Research. 41: 435-446.
- Davis, R.A., Doherty, T.S., Van Etten, E.J.B., Radford, J.Q., Knuckey, C., Holmes, F. and Davis, B. (2016). Conserving long unburnt vegetation is important for bird species, guilds and diversity. Biodiversity and Conservation. 25:2709-2722.
- Davis, R.A. and Watson, D.M. (2018). Vagrants as vanguards of range shifts in a dynamic world. Biological Conservation. 224: 238-241
- Molloy, S., Davis, R.A. and van Etten, E. (2013). Species distribution modelling using bioclimatic variables to determine the impacts of a changing climate on the western ringtail possum (Pseudocheirus occidentalis; Pseudocheiridae). Environmental Conservation 41(2): 176-186.
- Davis, R.A. and Doherty, T.S. (2015). Rapid recovery of an urban remnant reptile community following summer wildfire. PLoS One. 10(5): e0127925.

GRANTS

- Impacts of feral fauna predation on ground-dwelling native species at Charles Darwin Reserve, Edith Cowan University, ECU Industry Collaboration - Grant, 2011 - 2012, $146,984.
- Dampier Salts sites and ponds and their importance for migratory and other shorebirds, Dampier Salt Limited Perth Division, Grant-Dampsalt, 2010 - 2015, $394,997.
- Impacts of Fire on Reptiles in King's Park, Department of Biodiversity, Conservation and Attractions WA, Botanic Parks and Gardens - Grant, 2009 - 2020, $60,976.

Research Interests

- Bird Conservation and Ecology
- Urban Ecology
- Island Ecology
- Amphibian and Reptile Ecology
- Climate Change Impacts on Fauna

DR DAVID LUKE FIELD

PhD, BSc
Email: d.field@ecu.edu.au

David's research combines molecular genetics with ecological experiments and mathematical models to address fundamental questions in evolutionary biology: for example, how do new species form? What is the genetic basis of adaptive traits and what maintains spatial patterns of genetic variation? An important part of his work involves quantifying crucial evolutionary parameters in natural populations (e.g. fitness, selection, heritability, dispersal), which is of immense importance for evolutionary and conservation biology, and to plant breeding and global food security. A major focus is a long-term collaborative project on hybrid zones between snapdragons with different flower colours (in the Spanish Pyrenees), which combines detailed measurements of plant functional traits with genetic data to directly quantify fitness landscapes. Other research topics include mating system evolution, plant-pollinator interactions, polyploidy and genetic rescue in changing environments. David is also actively involved in the development of methods and programs for population genetic and genomic analyses. His research covers model and non-model plant systems (e.g. Eucalypts, Snapdragons) with ongoing collaborative projects based in Australia, North America and Europe. He is a member of the Genetics Society of Australasia and the European Society of Evolutionary Biology. His teaching revolves around genetics, evolution, molecular biology, ecology and bioinformatics.

SELECTED PUBLICATIONS

Journal Articles

- Tavares, H., Whibley, A., Field, DL., Bradley, D., Couchman, M., Copsey, L., … Coen, E. (2018). Selection and gene flow shape genomic islands that control floral guides. Proceedings of the National Academy of Sciences, 115(43), 11006–11011. doi: 10.1073/pnas.1801832115
- Ringbauer, H., Kolesnikov, A., Field, DL., Barton, NH. (2018). Estimating barriers to gene flow from distorted isolation-by-distance patterns. Genetics, 208(3), 1231–1245. doi: 10.1534/genetics.117.300638
- Bod'ová, K., Priklopil, T., Field, DL., Barton, NH., Pickup, M. (2018). Evolutionary pathways for the generation of new self-incompatibility haplotypes in a nonself-recognition system. Genetics, 209(3), 861–883. doi: 10.1534/genetics.118.300748
- Ellis, TJ., Field, DL., Barton, N. H. (2018). Efficient inference of paternity and sibship inference given known maternity via hierarchical clustering. Molecular Ecology Resources, 18(5), 988–999. doi: 10.1111/1755-0998.12782
- Bradley, D., Xu, P., Mohorianu, I.-I., Whibley, A., Field, D., Tavares, H., … Coen, E. (2017). Evolution of flower color pattern through selection on regulatory small RNAs. Science, 358(6365), 925–928. doi: 10.1126/science.aao3526
- Field, DL., Broadhurst, LM., Elliott, CP., Young, AG. (2017). Population assignment in autopolyploids. Heredity, 119(6), 389–401. doi: 10.1038/hdy.2017.51
- Ellis, TJ., Field, DL. (2016). Repeated gains in yellow and anthocyanin pigmentation in flower colour transitions in the Antirrhineae. Annals of Botany, 117(7), 1133–1140. doi: 10.1093/aob/mcw043
- Field, DL., Pickup, M., Barrett, SCH. (2013). Comparative analyses of sex-ratio variation in dioecious flowering plants. Evolution, 67(3), 661–672. doi: 10.1111/evo.12001

GRANTS

- Austrian Science Fund (€ 403,856 EUR, Stand-alone grant, P32166): The maintenance of alternative adaptive peaks in the face of gene flow in Snapdragons (Chief Investigator. 2019-2022).

Research Interests

- Population genetics, genomics and bioinformatics
- Plant mating system evolution and plant-pollinator interactions
- Speciation and hybridization
- Conservation biology and genetic rescue
- Theoretical evolutionary modelling and method development in population genetics and genomics

DR ANNA HOPKINS

PhD
Email: a.hopkins@ecu.edu.au

Anna is a lecturer in the School of Science and is the Course Coordinator for postgraduate coursework degrees in the Science and Mathematics Discipline. She teaches in the areas of biology, ecology, environmental science and science communication.

Anna has more than 15 years' experience in research and postgraduate supervision in projects relating to conservation biology and fungal ecology, with experience working with soil microbes, plant-fungal-fauna interactions and fungal plant pathogens in native ecosystems, plantation forests and agriculture in both Australasia and Scandinavia.

More recent research interests include understanding the impact of disturbances (such as drought, fire and urbanisation) on microbial ecology and ecosystem health, and using molecular tools to answer broad ecological and management-based questions. In 2017 Anna received the ECU Athena SWAN Advancement Scheme Kick-Start Science Prize for her research in microbial ecology.

SELECTED PUBLICATIONS

Journal Articles

- Birnbaum, C, Hopkins, AJM, Fontaine, J, Enright, N. (2019). The effects of experimental warming on rhizosphere fungal composition in Mediterranean-type ecosystem. Science of the Total Environment. 683:524-536. DOI: 10.1016/j.scitotenv.2019.05.222
- Hopkins, AJM, Ruthrof, KX, Fontaine, JB, Matusick, G, Dundas, SJ, Hardy, GEStJ. (2018). Forest die-off following global-change-type drought alters rhizosphere fungal communities. Environmental Research Letters. 13: 095006. DOI: 10.1088/1748-9326/aadc19
- Dundas, SJ, Hopkins, AJM, Ruthrof, KX, Tay, NE, Burgess, TI, Hardy, GEStJ and Fleming, PA. (2018). Digging mammals contribute to rhizosphere fungal community composition and seedling growth. Biodiversity and Conservation DOI: 10.1007//s10531-018-1575-1.
- Ruthrof, KX, Fontaine, J, Hopkins, AJM, McHenry, M, Skinner, P, Howieson, J, O'Hara, G and Hardy, GEStJ. (2018). Potassium amendment increases biomass and reduces heavy metal uptake in Lablab purpureus after phosphate mining. Land Degradation and Development. DOI: 10.1002/ldr.2866
- Tay, NE, Hopkins, AJM, Ruthrof, KX, Burgess, TI, Hardy, GEStJ, Fleming, PA. (2018). The tripartite relationship between a bioturbator, mycorrhizal fungi, and a key Mediterranean forest tree. Austral Ecology. DOI: 10.1111/aec.12598.
- Millberg, H, Hopkins, AJM, Boberg, JB, Davydenko, K and Stenlid, J. (2016). Disease development of Dothistroma needle blight in seedlings of Pinus sylvestris and P. contorta under Nordic conditions. Forest Pathology. DOI: 10.1111/efp.12242.
- Klapwijk, MJ, Hopkins, AJM, Eriksson, L, Schroeder, M, Lindelöw, Å, Rönnberg, J, Keskitalo, ECH and Kenis, M. (2016). Reducing the risk of invasive forest pests and pathogens: Combining legislation, targeted management and public awareness. Ambio. 45(2): 223-234.

GRANTS

- Understanding soil microbial community shifts in response to fire and weed invasions in urban banksia woodlands, Department of Biodiversity, Conservation and Attractions WA, Scholarships to Support Industry Engagement PhD Projects, 2018 - 2021, $129,500.
- Harnessing the microbes associated with soil water repellency to enhance plant survival and growth, Edith Cowan University, ECU Industry Collaboration Scheme - 2016 Open Round, 2017 - 2019, $88,626.

Research Interests

- Impact of disturbance (e.g. drought, fire, urbanisation) on microbial ecology and ecosystem function
- Molecular tools and their ecological applications (especially diet analysis and eDNA).
- Interactions between mycorrhiza, plant hosts and ecosystem function (especially mycophagous fauna and digging mammals)
- Ecology, management and biosecurity of forest pathogens
- Soil microbial ecology and alternative farming methods

DR KRISTINA LEMSON

PhD, BSc
Email: k.lemson@ecu.edu.au

Dr Kristina Lemson is a botanist specializing in Plant Systematics and Evolution. She worked in agriculture and conservation before joining ECU, and currently supervises diverse research projects that intertwine evolutionary biology, plant science, conservation and computing. These include research on germination cues in Ericaceae, conservation of rare and endangered flora, micropropagation and evolution within Ericaceae and Proteaceae. Her personal research aims to enhance knowledge of the Australian flora, through discovering and describing new species and understanding their evolutionary relationships.

Dr Lemson has wide experience in community-engaged teaching and research. She is a member of the multi-award-winning "Old Ways, New Ways" indigenous science program, and works with Aboriginal and Torres Straits Islander communities to build understanding of Indigenous knowledge systems in science, and support the aspirations of Aboriginal and Torres Straits Islander students to study in the field. She is a past member of the councils of the Ecological Society of Australia and the Australian Systematic Botany Society, and currently holds a number of community positions. She curates of the Robert Brown Herbarium (ECU) and previously was Courses Coordinator for the Science discipline.

SELECTED PUBLICATIONS

Journal Articles

- Lemson K (2015). Typifications in Andersonia R.Br. (Ericaceae:Epacridoideae) . Telopea 18: 109-114
- Prober S, Thiele K, Rundel P, Yates C, Berry S, Byrne M, Christidis, Gosper C, Grierson P, lemson K ...and 9 others (2012) . Facilitating adaptation of biodiversity to climate change: a conceptual framework applied to the world's largest Mediterranean-climate woodland. Climatic Change 110: 227-248
- Lemson KL (2011) Pollen in Cosmelieae: are monads in Andersonia macranthera unique? International Journal of Plant Science 172: 664-673
- Wagstaff SJ, Dawson MI, Venter S, Munzinger J, Crayn DM, Steane DA and Lemson KL. 2010. Origin, Diversification, and Classification of the Australasian Genus Dracophyllum (Richeeae, Ericaceae). Annals of the Missouri Botanical Gardens 97: 235–258.

GRANTS

- Making headway with Ericaceae – a contribution toward a Flora of Australia account of Epacridoideae, Department of the Environment and Energy, National Taxonomy Research Grant Programme, 2019 - 2021, $1,880.

Research Interests

- Plant systematics and evolution, with a focus on species boundaries and phylogeny reconstruction in the Australian flora
- Indigenous plant knowledge

DR JOHNNY LO

PhD
Email: j.lo@ecu.edu.au

Dr Johnny Lo has occupied a teaching and research lecturing position at ECU since the completion his PhD in early 2012. His area of expertise lies in applied statistics. Dr Johnny Lo has extensive experience as a statistician and has been involved in a number of industry projects, including those with Roc Oil Company Limited, Water Corporation, Woodside Energy, and more recently, Department of Primary Industries and Regional Development. Since joining ECU, he has been actively involved in a number of inter-disciplinary projects within and outside of ECU. Most of his recent collaborations are in health domain; including mental health, nutrition, drugs and melanoma studies. He is also currently collaborating with the research teams at Fremantle and Fiona Stanley hospital.

Dr Johnny Lo is a co-recipient (as a chief investigator) of 6 research grants totalling over AU$11 million, which included an NHMRC grant. His career total of publications to date includes 29 refereed journal articles and one book chapter. He has supervised 4 PhD, 3 Masters, and 1 Honours students to completion, and is currently co-supervising 6 PhD and 1 Masters candidates.

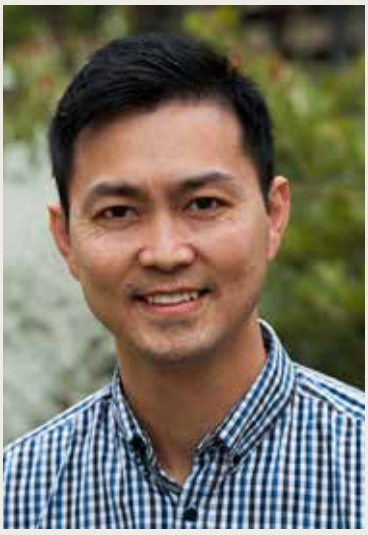
SELECTED PUBLICATIONS

Journal Articles

- Genoni, A., Christophersen, CT., Lo, J., Coghlan, M., Boyce, M.C., Bird, A., Lyons Wall, P., Devine, A. (2019). Long term Paleolithic diet is associated with lower resistant starch intake, different gut microbiota composition and increased serum TMAO concentrations. European Journal of Nutrition, doi: 10.1007/s00394-019-02036-y.
- Genoni, A., Lo, J., Lyons-Wall, P., Boyce, M.C., Christophersen, C.T. Bird, A. and Devine, A. (2019) A Paleolithic diet lowers resistant starch intake but does not affect serum trimethylamine-N-oxide concentrations in healthy women, British Journal of Nutrition, 121(3):322-329, doi: 10.1017/S000711451800329X.
- Butcher, L.M., O'Sullivan, T.A., Ryan, M.M., Lo, J., Devine, A. (2018). Utilising a multi-item questionnaire to assess household food security in Australia, Health Promotion Journal of Australia, 30:9-17, doi: 10.1002/hpja.61.
- Zaenker, P., Lo, J., Pearce, R., Cantwell, P., Cowell, L., Lee, M., Quirk, C., Law, H., Gray, E. and Ziman, M. (2018). A diagnostic autoantibody signature for primary cutaneous melanoma, Oncotarget, 9(55):30539-30551, doi: 10.18632/oncotarget.25669.
- Bowers, J., Lo, J., Miller, P., Mawren, D. and Jones. B (2018). Psychological distress in remote mining and construction workers in Australia, The Medical Journal of Australia, 208 (9): 391-397, doi: 10.5694/mja17.00950.
- Genoni, A., Lo, J., Lyons-Wall, P. and Devine, A. (2016). Compliance, palatability and feasibility of Paleolithic and Australian Guide to Healthy Eating diets in healthy women: A 4-week dietary intervention, Nutrients, 8(8):481, doi: 10.3390/nu8080481.
- Genoni, A., Lyons-Wall, P., Lo, J. and Devine, A. (2016). Cardiovascular, metabolic effects and dietary composition of ad-libitum Paleolithic vs. Australian Guide to Healthy Eating diets: A 4-week randomised trial, Nutrients, 8(5):314, doi: 10.3390/nu8050314.

GRANTS

- Liquid biopsy for personalised monitoring of melanoma patients, NHMRC, Development Grants, 2017 - 2020, $950,389.
- Integrated state-wide survey of recreational fishing Phase 2: boat- and shore based activity, Department of Primary Industries and Regional Development, Grant, 2015 - 2019, $3,297,050.
- A Blood Based 'Liquid Biopsy' to Improve Healthcare for Metastatic Melanoma Patients, Department of Health WA, SHRAC Research Translation Projects, 2016 - 2018, $4,075,030.



Research Interests

- Applied statistics
- Biostatistics

DR EDDIE VAN ETTEN

PhD, MAppSc
Email: e.van_etten@ecu.edu.au

Dr Eddie van Etten is a plant ecologist with extensive research experience across a range of Western Australian ecosystems, including arid spinifex grasslands, semi-arid shrublands, Banksia woodlands and jarrah forests. His research interests span from vegetation ecology and mapping to fire ecology and management, plant-animal interactions (including pollination and seed dispersal), restoration ecology and invasive plants. He has successfully supervised 16 postgraduate students (9 PhD and 7 Masters) to completion over the last 10 years. Over the last 5 years he has published 35 peer-reviewed papers with co-authors.

SELECTED PUBLICATIONS

Book Chapters

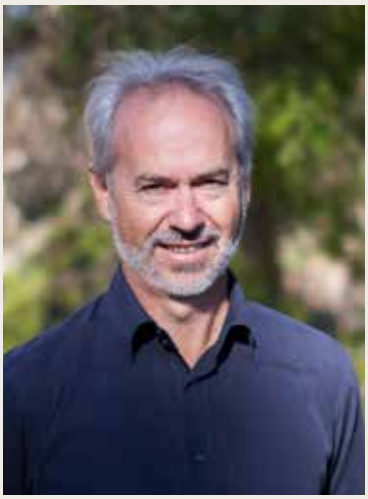
- Van Etten, E.J.B. & Burrows, N.D. (2018). Fire regimes and ecology of arid Australia. Chapter 10 in Lambers, H (ed.), On the Ecology of Australia's Arid Zone. Springer, Dordrecht, NL.

Journal Articles

- Calviño-Cancela, M. & van Etten, E.J.B. (2018). Invasive potential of Eucalyptus globulus and Pinus radiata into native eucalypt forests in Western Australia. Forest Ecology & Management 424: 246-258.
- Van Etten, E.J.B. & Fox, J.E.D (2017). Vegetation - environment relationships of the Hamersley Ranges, a mountainous desert of north-west Australia. Folia Geobotanica 52: 161-173.
- Doherty, T.S., van Etten, E.J.B., Davis, R.A., Knuckey, C., Radford, J.Q. & Dalgleish, S.A. (2017) Ecosystem responses to fire: identifying cross-taxa contrasts and complementarities to inform management strategies. Ecosystems 20: 872-884.
- Knuckey, C., van Etten, E.J.B. & Doherty, T.S. (2016). Effects of long-term fire exclusion and frequent fire on plant community composition: a case study from semi-arid shrublands. Austral Ecology 41: 964-975.
- Van Etten, E.J.B. (2013). Changes to land tenure and pastoral lease ownership in Western Australia's central rangelands: implications for co-operative, landscape-scale management. The Rangeland Journal 35: 37-46.
- Calvino-Cancela, M., Rubido-Bará, M. & van Etten, E.J.B. (2012). Do eucalypt plantations provide habitat for native forest biodiversity? Forest Ecology & Management 270: 153-162.
- van Etten, E.J.B. (2009). Inter-annual rainfall variability in arid Australia: greater than elsewhere? Australian Geographer 40: 107-118.

GRANTS

- 2016 – 2020: Improving conservation outcomes for the threatened species Conospermum undulatum and the threatened ecological community SCP20a. Department of Biodiversity, Conservation and Attractions WA & ECU Industry Engagement PhD Scholarships; $139,000.
- 2017 – 2019: Assessing restoration success using reptiles and small mammals. Gundawa Regional Conservation Association Small Grant Scheme; $34,000 (with Dr R. Davis, ECU).
- 2011 – 2016: Ecohydrological habitat characterisation and modelling to improve restoration prioritisation and outcomes within former pine plantation areas of the Gnangara Mound, Western Australia. Department of Biodiversity, Conservation and Attractions WA; $146,314 (with Profs W. Stock and R. Froend).



Research Interests

- Vegetation ecology, including classification and mapping
- Restoration ecology, including mine closure and rehabilitation
- Fire ecology and management
- Arid zone and rangeland ecology and management
- Invasive plant species – impacts and control

DR MAGDALENA WAJRAK

PhD
Email: m.wajrak@ecu.edu.au

Dr Wajrak's main area of research is electrochemistry, more specifically, development of infield voltammetric methods for low level detection of heavy metals, such as arsenic, lead, cadmium, copper and mercury in water, soil samples and gunshot residues. Dr Wajrak is also part of ESRI research group, developing novel miniature pH sensors for use in complex matrixes such as body fluids and foods. In addition Dr Wajrak has a strong interest in chemical education, in particular, designing multimedia chemistry teaching resources, new experiments and lecture demonstrations to help students understand abstract chemical concepts.

SELECTED PUBLICATIONS

Journal Articles

- Chandler, G., Khan, Nazim, Wajrak, M., 'Neutron Diffraction Structures of Water in Crystalline Hydrates of Metal Salts', Acta Cryst. (2015), B71, 275,
- Lonsdale, W., Maurya, D. K., Wajrak, M., Tay, C. Y., Marshall, J. B. and Alameh, K, Wajrak, M. 'Rapid measurement of urease activity using a potentiometric RuO2 pH sensor for detection of Helicobacter pylori', Sensors and Actuators B: Chemical (2016).
- Lonsdale, W., Maurya, D. K., Wajrak, M. and Alameh, K. 'Effect of ordered mesoporous carbon contact layer on the sensing performance of sputtered RuO2 thin film pH sensor', TALANTA (2017), Vol. 164.
- Robertson, F., Barrow, J., Wajrak, M., Nunnup, N. and Bishop, C., "Participatory action and duel lens research" (QRJ-12-2016-0075.R1) Qualitative Research Journal, May 2017.
- Lonsdale, W, Wajrak, M and Alameh, K, "RuO2 pH Sensor with Super-Glue-Inspired Reference Electrode", Sensors, 17, 2036, 2017.
- Lonsdale, W., Shylendra, S. P., Brouwer, S., Wajrak, M. and Alameh, K., "Application of ruthenium oxide pH sensitive electrode to samples with high redox interference", Sensors & Actuators: B. Chemical 273 (2018) 1222–1225.
- Lonsdale, W, Wajrak, M., Alameh, K, "Manufacture and application of RuO2 solid-state metal-oxide pH sensor to common beverages", TALANTA 180 (2018) 277–28.
- Lonsdale, W., Shylendra, S. P., Wajrak, M. and Alameh, K., "Application of all solid-state 3D printed pH sensor to beverage samples using matrix matched standard", TALANTA, 196 (2019) 18-21.

GRANTS

- 2019 $1,983. ECU Teaching and Learning Grant. Implementation of electronic lab books in first year chemistry lab classes.
- 2019 $99,784. Curtin/CleanSubSea Industry Collaborative Grant. Detection of copper in ship's hull cleaning water.
- 2015-2019 $200,636. HEPPP Grant. Old Ways New Ways Outreach Program.

Research Interests

- Electrochemistry
- pH Sensors
- Quantum Chemistry
- Chemical Education

PROFESSOR KAMAL ALAMEH

PhD, MEngSc
Email: k.alameh@ecu.edu.au

Professor Kamal Alameh is the Director of the Electron Science Research Institute (ESRI) at Edith Cowan University. He has over 20 years of research experience in photonics, optoelectronics and Opto- VLSI. At ECU, he established world-class Photonics and Electronics Labs as well as a 256m2 cleanroom equipped with state-of-the-art facilities for the design, fabrication, characterisation, programming and testing of integrated micro and nano photonic structures, devices and systems.

He has authored or co-authored 320 technical articles at prestigious journals, including Nature Communications, key international conferences, and workshops, filed 25 patents and received a total research support in excess of $20 million.

Research Interests

- MicroPhotoncis
- Opto-VLSI
- NanoPhotonics
- Plasmonics
- Photonics-based sensors
- Nano-bio
- Renewable energy
- Security and Defence

SELECTED PUBLICATIONS

Journal Articles

- Vasiliev, M., Alam, MN., Alameh, K., (2019), Initial Field Testing Results from Building-Integrated Solar Energy Harvesting Windows Installation in Perth, Australia. Applied Sciences, 2019(9), 4002, Basel, Switzerland , DOI: 10.3390/app9194002.
- Vasiliev, M., Alameh, K., Alam, MN., (2019), Analysis, Optimization, and Characterization of Magnetic Photonic Crystal Structures and Thin-Film Material Layers. Technologies, 7(3), 49, Switzerland, DOI: https://doi.org/10.3390/technologies7030049.
- Vasiliev, M., Alam, MN., Alameh, K., (2019), Recent Developments in Solar Energy-Harvesting Technologies for Building Integration and Distributed Energy Generation. Energies, 12(6), article no. 1080, Switzerland, DOI: 10.3390/en12061080.
- Alam, MN., Vasiliev, M., Belotelov, V., Alameh, K., (2018), Properties of Ferrite Garnet (Bi, Lu, Y)3(Fe, Ga)5O12 Thin Film Materials Prepared by RF Magnetron Sputtering. Nanomaterials, 5(8), Article no.355, DOI: 10.3390/nano8050355.
- Vasiliev, M., Alameh, K., Badshah, MA., Kim, S., Alam, MN., (2018), Semi-Transparent Energy-Harvesting Solar Concentrator Windows Employing Infrared Transmission-Enhanced Glass and Large-Area Microstructured Diffractive Elements. Photonics, 5(3), article no.25, Basel, Switzerland, MDPI AG, DOI: 10.3390/photonics5030025.
- Sekatskii, S., Smirnov, A., Dietler, G., Alam, MN., Vasiliev, M., Alameh, K., (2018), Photonic Crystal-Supported Long-Range Surface Plasmon-Polaritons Propagating Along High-Quality Silver Nanofilms. Applied Sciences, 2(8), Article number 248, Switzerland, MDPI, DOI: 10.3390/app8020248.
- Kotov, V., Shavrov, V., Vasiliev, M., Alameh, K., Alam, MN., Balabanov, D., (2018), Properties of magnetic photonic crystals in the visible spectral region and their performance limitations. Photonics and Nanostructures: fundamentals and applications, 28(February 2018), 12-19, DOI: 10.1016/j.photonics.2017.11.003.
- Wajrak, M., Lonsdale, W., Alameh, K., (2018), Manufacture and application of RuO2 solid-state metal-oxide pH sensor to common beverages. Talanta, 180(1 April 2018), 277-281, DOI: 10.1016/j.talanta.2017.12.070.

GRANTS

- Hybrid RF/optical catheter for effective Atrial Fibrillation (AF) ablation, Australian Research Council, Grant - Linkage (Projects), 2017 - 2021, $1,510,587.
- Design and development of an automatic roadline marking system, Supalux Pty Ltd, Grant, 2019 - 2020, $250,000.
- New Optical Wireless Frontier: Design Challenges of Multi Gigabit Wireless, Australian Research Council, Grant - Discovery Projects, 2017 - 2020, $60,000.

ASSOCIATE PROFESSOR STEVEN HINCKLEY

PhD, BSc(Hons) Theoretical Physics
Email: s.hinckley@ecu.edu.au

Steven Hinckley worked for the Telecom Research Laboratories in Melbourne from 1984 to 1990, as a Research Scientist. This included work on thin-film photovoltaics and electrochemical power sources (RAPS). He was with the Commonwealth Science and Industrial Research Organization (CSIRO) Division of Applied Physics from 1990 to 1993, as an Experimental Scientist. This work was on thin-film materials and photovoltaics, and magnetron sputtering of thin films. He has been a Lecturer with Edith Cowan University since 1993. He has been a Senior Lecturer since 2003, and an Associate Professor since 2009. Dr. Hinckley is an active member of the Australian Institute of Physics, the Institution of Electrical and Electronic Engineers (IEEE), the American Vacuum Society, the Society of Photo-Instrumentation Engineers (SPIE), the Optical Society of America, and the Electrochemical Society.

SELECTED PUBLICATIONS

Journal Articles

- G. Wild, S. Hinckley, (2008), Acousto-ultrasonic optical fiber sensors: Overview and state-of-the-art, IEEE Sensors, 8(7), 1184-1193, IEEE Press, DOI: 10.1109/JSEN.2008.926894.
- G. Allwood, S. Hinckley, G. Wild, (2016), Optical Fiber Sensors in Physical Intrusion Detection Systems: A Review. IEEE Sensors Journal, 16(14), 5497-5509, IEEE Sensors Council, DOI: 10.1109/JSEN.2016.2535465.
- I. Brouk, Y. Nemirovsky, S. Lachowicz, E.A. Gluszak, S. Hinckley, K. Eshraghian, (2002), Characterization of crosstalk between CMOS photodiodes, Solid State Electronics, 46(1), 53-59, Pergamon. DOI: 10.1016/S0038-1101(01)00268-4
- G. Wild, S. Hinckley, (2008), A transmit reflect detection system for fibre Bragg grating acoustic emission and transmission sensors, in Smart Sensors and Sensing Technology, pp.183-197, Springer, Berlin, Heidelberg. DOI: 10.1007/978-3-540-79590-2_13. ISBN 978-3-540-79589-6.
- G. Allwood, G.Wild, A. Lubansky, S. Hinckley, (2015), A highly sensitive fiber Bragg grating diaphragm pressure transducer. Optical Fiber Technology, 25(1), 25-32, Maryland Heights, USA, Academic Press Inc., DOI: 10.1016/j.yofte.2015.06.001.
- P. Jansz, S. Richardson, G. Wild, S. Hinckley, (2014), Characterizing the resolvability of real superluminescent diode sources for application to optical coherence tomography using a low coherence interferometry model. Journal of Biomedical Optics, 19(8), Article no. 085003, SPIE, DOI: 10.1117/1.JBO.19.8.085003.
- C. Angelos, S. Hinckley, R. Michalzik, V. Voignier, (2004), Simulation of current spreading in bottom-emitting vertical cavity surface emitting lasers for high-power operation, SPIE Proc .Photonics: Design, Technology, and Packaging, Vol. 5277, 261-272, International Society for Optics and Photonics, DOI: 10.1117/12.522899.
- S. Hinckley, J.F. McCann, D. Haneman, (1984), A flux analysis of the current–voltage characteristics of thin film frontwall illuminated and backwall illuminated liquid junction and metal junction solar cells, Journal of Applied Physics, 54(4), 1955-1965, DOI: 10.1063/1.332250.

GRANTS

- Next Generation Small Angle X-Ray Scattering Facility, Australian Research Council, Grant - Linkage (Infrastructure), 2014, $1,725,000.
- Nanoscale Characterisation Centre for Western Australia (NCC WA), WA Centre of Excellence, 2006 - 2011, $9,761,000
- Wireless acoustic sensor for the detection, identification and monitoring of biological hazards in grain silos and storage systems, Grains Research & Development Corporation, Protecting Your Crop, 2014 - 2016, $344,334.

Research Interests

- Optical fibre sensing, including interferometer-based systems
- Optically-based imaging, such as biomedical imaging
- Acoustic sensing, including acoustic emissions, structural health monitoring and insect acoustic signatures
- Microelectronic materials and devices, including CMOS imaging array structures, solar cells and photovoltaic systems
- Security detection and defence technology

DR STEVEN RICHARDSON

PhD
Email: s.richardson@ecu.edu.au

Dr Steven Richardson is a senior lecturer in the School of Science at Edith Cowan University. He obtained a Bachelor of Science (first class honours) in applied mathematics in 2002, and a PhD in applied mathematics in 2008, both from the University of Western Australia. Dr Richardson has conducted research in a number of areas including the optimisation of maintenance scheduling, optical systems such as Optical Coherence Tomography and Fibre Bragg gratings, and the estimation of heat flux on buildings/structures in bush fires.

SELECTED PUBLICATIONS

Journal Articles

- Penney, G. & Richardson, S. (2019). Empirical wildfire modelling of non-uniform vegetation fuel beds and the impact of urban development. Fire, 2,4, doi:10.3390/fire2010004
- Jansz, P.V., Richardson, S., Wild, G. & Hinckley, S. (2014). Characterising the resolvability of real superluminescent diode sources for application to optical coherence tomography using a low coherence interferometry model. Journal of Biomedical Optics. 19(8), 085003. doi:10.1117/1.JBO.19.8.085003
- Richardson, S., Kefford, A. & Hodkiewicz, M. (2013) Optimised asset replacement strategy in the presence of lead time uncertainty, International Journal of Production Economics, 141(2), 659-667P4
- Wild, G. & Richardson, S. (2013). Numerical Modelling of Intensity based Optical Fibre Bragg Grating Sensor Interrogation Systems. Opt. Eng. 52 (2), 024404-1 – 24404-9.
- Richardson, S. & Hodkiewicz, M. (2011) Modelling tool to support budgeting and planning decisions for pump overhauls, Journal of Water Resources Planning and Management, 137(4), 327-334.
- Richardson, S. & Wang, S. (2010). The viscosity approximation to the Hamilton-Jacobi-Bellman equation in optimal feedback control: Upper bound for extended domains, Journal of Industrial and Management Optimization, 6(1), 161-175.
- Richardson, S., Wang, S. & Jennings, L.S. (2008). A multivariate adaptive regression B-spline algorithm (BMARS) for solving a class of nonlinear optimal feedback control problems, Automatica, 44, 1149-1155.
- Richardson, S. & Wang, S. (2006). Numerical solution of Hamilton-Jacobi-Bellman equations by an exponentially fitted finite volume method, Optimization, 55(1-2) p.121-140.

Research Interests

- Mathematical Modelling

PROFESSOR DAVID SUTER

PhD
Email: d.suter@ecu.edu.au

Professor David Suter and his team at ECU conduct world-leading research in computer vision and big-data analysis. His special expertise includes robust statistical fitting, computational geometry and machine learning.

Professor Suter served as a member of Australian Research Council College of Experts (2008-2011) and has held a number of prestigious editorial positions including Editorial Board member "International Journal of Computer Vision" (2004-2013) (currently on the Honorary Editorial Board), Editorial Board member "Pattern Recognition" (Aug 2017 – present), Editorial Board member "IPSJ Transactions on Computer Vision and Applications" (2008- 2013), Editorial Board member "Journal of Mathematical Imaging and Vision" (2007-2010) and Editorial Board member "Machine Vision and Applications" (2006- 2008).

Professor Suter has been awarded more than $10m in national competitive research funding and his consultancy work has included forensic image analysis, automated power transmission line visual inspection, and visual odometry for automating port container tracking.

SELECTED PUBLICATIONS

Books:

- Chin, Tat-Jun and David Suter (2017). The Maximum Consensus Problem: Recent Algorithmic Advances. Synthesis Lectures on Computer Vision (Eds. Gerard Medioni and Sven Dickinson). Morgan & Claypool, pp. 194–194.

Journal Articles

- Wang, H, Xiao, G, Yan, Y & Suter, D (2019,) 'Searching for Representative Modes on Hypergraphs for Ro- bust Geometric Model Fitting', IEEE Transactions on Pattern Analysis and Machine Intelligence, vol. 41, no. 3, pp. 697- 711.
- Xiao, G, Wang, H, Yan, Y & Suter, D (2018), 'Superpixel-Guided Two-View Deterministic Geometric Model Fitting', International Journal of Computer Vision. DOI: 10.1007/s11263-018-1100-8.
- Chin, T. J., P. Purkait, A. Eriksson, and D. Suter (2017). "Efficient Globally Optimal Consensus Maximisation with Tree Search". In: IEEE Transactions on Pattern Analysis and Machine Intelligence 39.(4), 758–772.
- Lai, T., H. Wang, Y. Yan, G. Xiao, and D. Suter (2017). "Efficient guided hypothesis generation for multi- structure epipolar geometry estimation". In: Computer Vision and Image Understanding 154, 152–165.
- Purkait, P., T. J. Chin, A. Sadri, and D. Suter (2017). "Clustering with Hypergraphs: The Case for Large Hyperedges". In: IEEE Transactions on Pattern Analysis and Machine Intelligence pp.(99), 1–1.
- Bustos, A. Parra, T. J. Chin, A. Eriksson, H. Li, and D. Suter (2016). "Fast Rotation Search with Stereo- graphic Projections for 3D Registration". In: IEEE Transactions on Pattern Analysis and Machine Intelligence 38.(11), 2227–2240.
- Tennakoon, R.B., A. Bab-Hadiashar, Z. Cao, R. Hoseinnezhad, & D. Suter (2016). "Robust Model Fitting Using Higher Than Minimal Subset Sampling". In: IEEE Transactions on Pattern Analysis and Machine Intelligence 38.(2), 350–362.
- Xiao, G, Wang, H, Lai, T & Suter, D (2016), 'Hypergraph modelling for geometric model fitting', Pattern Recognition, vol. 60, pp. 748 – 760.

GRANTS

- 2016-2019 Visual intelligence for safe vehicle operation in industrial environment. Australian Research Council, Linkage Projects, $285,000
- 2016-2018 Space-based space surveillance with robust computer vision algorithms. Australian Research Council, Linkage Projects, $275,000
- 2016-2018 Optimal robust fitting under the framework of LP-type methods. Australian Research Council, Discovery Projects, $268,000

Research Interests

- Computer Vision
- Image Processing
- Machine Learning
- Data Mining
- Artificial Intelligence
- Robust Statistical Model Fitting

ASSOCIATE PROFESSOR C. PENG LAM

PhD
Email: c.lam@ecu.edu.au

Peng is an Associate Professor of Software Engineering and is a postgraduate coordinator in the School of Science. Her teaching and research focus is in the area of search-based software engineering, image analysis and computational intelligence within the School of Science. She is the co-leader of the Artificial Intelligence and Optimisation Research Cluster. She is a member of the Institute of Electrical and Electronics Engineers (IEEE).

SELECTED PUBLICATIONS

Journal Articles

- Masek, M., Lam, P., Tranthim-Fryer, C., Jansen, B., Baptist, K., (2018), Sleep monitor: A tool for monitoring and categorical scoring of lying position using 3D camera data. SoftwareX, 7(January–June 2018), 341-346, DOI: 10.1016/j.softx.2018.10.001.
- Masek, M., Boston, J., Lam, P., Corcoran, S., (2017), Improving mastery of fractions by blending video games into the Math classroom. Journal of Computer Assisted Learning, 33(5), 486-499, DOI: 10.1111/jcal.12194.
- Pech, A., Masek, M., Lam, P., Hingston, P., (2016), Game level layout generation using evolved cellular automata. Connection Science, 28(1), 63-82, Taylor & Francis, DOI: 10.1080/09540091.2015.1130020.
- Adi, E., Baig, Z., Hingston, P., Lam, P., (2016), Distributed denial-of-service attacks against HTTP/2 services. Cluster Computing, 19(1), 79-86, Springer New York LLC, DOI: 10.1007/s10586-015-0528-7.
- Pazhoumanddar, H., Lam, P., Masek, M., (2015), Joint movement similarities for robust 3D action recognition using skeletal data. Journal of Visual Communication and Image Representation, 30(July 2015), 10-21, DOI: 10.1016/j.jvcir.2015.03.002.
- Rastegari, S., Hingston, P., Lam, P., (2015), Evolving statistical rulesets for network intrusion detection. Applied Soft Computing Journal, 33(1 September 2015), 348-359, Elsevier Ltd, DOI: 10.1016/j.asoc.2015.04.041.

Published Conference Proceedings

- Masek, M., Lam, P., Benke, L., Kelly, L., Papasimeon, M., (2018), Discovering Emergent Agent Behaviour with Evolutionary Finite State Machines. PRIMA 2018: Principles and Practice of Multi-Agent Systems, 11224(October 31-November 2, 2018), 19-34, Cham, Springer.
- Pazhoumanddar, H., Lam, P., Masek, M., (2017), An Automatic Approach for Generation of Fuzzy Membership Functions. Agents and Artificial Intelligence 8th International Conference, ICAART 2016, Revised Selected Papers, LNAI, volume 10162(24-26 February, 2016), 247-264, Springer, DOI: 10.1007/978-3-319-53354-4_14.
- Pazhoumanddar, H., Masek, M., Lam, P., (2016), Unsupervised monitoring of electrical devices for detecting deviations in daily routines. 2015 10th International Conference on Information, Communications and Signal Processing (ICICS), 1-6, IEEE, DOI: 10.1109/ICICS.2015.7459849.

GRANTS

- Evolutionary Algorithms for Real Time Strategy games, Defence Science and Technology Group of the Department of Defence, Grant, 2018 - 2019, $53,373.
- Evolutionary Algorithms for Complex Multi-Agent Simulation of Air Operations, Defence Science and Technology Group of the Department of Defence, Grant, 2017 - 2018, $97,846.
- Co-Evolutionary Algorithms for Multi-Agent Simulation of Air Operations, Defence Science and Technology Group of the Department of Defence, Grant, 2016 - 2017, $44,339.
- Establishing a 3D sensing, visualisation and analytics lab, Edith Cowan University, School of Science 2017 Strategic Initiative Fund, 2017, $115,368.

Research Interests

- Software Testing
- Health Information Technology
- Search-based Software Engineering
- Data Mining
- Computational Intelligence
- Image Processing
- Search-based Software testing
- Mobile phone remote health diagnosis
- Data mining
- Bioinformatics
- Computational red teaming

ASSOCIATE PROFESSOR MARTIN MASEK

PhD, BEng(Hons)
Email: m.masek@ecu.edu.au

A.Prof. Martin Masek is a member of the Artificial Intelligence and Optimisation Research Group. He teaches in the areas of Computer Science and Software Engineering. Martin obtained his PhD, focusing on medical image processing, in 2004 and joined Edith Cowan University in 2005. His research involves the application of artificial intelligence and image processing techniques to solve problems in a variety of domains such as health, education and defence. This has resulted in collaboration with partners such as Microsoft Research, The National Archives, The National Trust and The Defence Science Technology Group.

SELECTED PUBLICATIONS

Book Chapters:

- Fitzgibbons, Y., Masek, M., (2017), Bringing Texts to Life: An Augmented Reality Application for Supporting the Development of Information Literacy Skills. Mobile Technology and Academic Libraries: Innovative Services for Research and Learning, 223-236, Chicago, USA, Association of College and Research Libraries.

Journal Articles

- Masek, M., Lam, C. P., Tranthim-Fryer, C., Jansen, B., & Baptist, K. (2018). Sleep monitor: A tool for monitoring and categorical scoring of lying position using 3D camera data. SoftwareX, 7, 341-346.
- Masek, M., Boston, J., Lam, P., Corcoran, S., (2017), Improving mastery of fractions by blending video games into the Math classroom. Journal of Computer Assisted Learning, 33(5), 486-499, DOI: 10.1111/jcal.12194
- Pech, A., Masek, M., Lam, P., Hingston, P., (2016), Game level layout generation using evolved cellular automata. Connection Science, 28(1), 63-82, Taylor & Francis, DOI: 10.1080/09540091.2015.1130020
- Pazhoumanddar, H., Lam, P., Masek, M., (2015), Joint movement similarities for robust 3D action recognition using skeletal data. Journal of Visual Communication and Image Representation, 30(July 2015), 10-21, DOI: 10.1016/j.jvcir.2015.03.002

GRANTS

- Pathway to healthy food environments: a guide for local governments in Western Australia, Healthway (WA Health Promotion Foundation), Healthway - Grant, 2018 - 2021, $710,084.
- Evolutionary Algorithms for Real Time Strategy games, Defence Science and Technology Group of the Department of Defence, Grant, 2018 - 2019, $53,373.
- Evolutionary Algorithms for Complex Multi-Agent Simulation of Air Operations, Defence Science and Technology Group of the Department of Defence, Grant, 2017 - 2018, $97,846.

Research Interests

- Computer vision and image processing
- Artificial intelligence and machine learning
- Applications of games technology

DR SYED MOHAMMED SHAMSUL ISLAM

PhD, MSc, PGDTE, BSc, MIEE, MACH (Snr) CP IP3P
Email: syed.islam@ecu.edu.au

Dr Islam completed his PhD with Distinction in Computer Engineering from the University of Western Australia (UWA) in 2011. He received his MSc in Computer Engineering from King Fahd University of Petroleum and Minerals (KFUPM) in 2005 and BSc in Electrical and Electronic Engineering from Islamic Institute of Technology in 2000. He was a Research Assistant Professor at UWA from 2011 to 2015, a Research Fellow at Curtin University from 2013 to 2015 and a Lecturer at UWA from 2015-2016. Since 2016, he has been working as Lecturer in Computer Science at Edith Cowan University. He has published around 58 research articles and got 13 public media releases. He obtained 17 competitive research grants for his research in the area of Image Processing, Computer Vision and Medical Imaging. He has co-supervised to completion eight honours and postgrad students and currently supervising one MS and nine PhD students. He is serving as Associate Editor of two international journals, Technical Committee Member of 25 conferences and regular reviewer of 26 journals (including ACM Computing Surveys, and IEEE Access). He is also serving seven professional bodies including IEEE (Secretary of Signal Processing Chapter, WA Section) and Australian Computer Society (Senior Member).

SELECTED PUBLICATIONS

Book Chapters

- Moniruzzaman, M, Islam, SMS, Bennamoun, M & Lavery, P 2017, 'Deep Learning on Underwater Marine Object Detection: A Survey', Advanced Concepts for Intelligent Vision Systems, Springer International Publishing, pp. 150–160, doi:10.1007/978-3-319-70353-4_13.

Journal Articles

- Altaf, F., Islam, S.M.S., Akhtar, N. and Janjua, N.K., "Going Deep in Medical Image Analysis: Concepts, Methods, Challenges and Future Directions", IEEE Access. (Accepted Jul 11, 2019), pre-eprint arXiv:1902.05655.
- Cisonni, J, Lucey, AD, King, AJC, Islam, SMS & Lewis, R et al. 2015, 'Numerical simulation of pharyngeal airflow applied to obstructive sleep apnea: effect of the nasal cavity in anatomically accurate airway models', Medical and Biological Engineering and Computing, vol. 53, no. 11, pp. 1129-1139
- Islam, SMS, Davies, R, Bennamoun, M, Mian, AS 2011, 'Efficient Detection and Recognition of 3D Ears', International Journal of Computer Vision, vol. 95, no. 1, pp. 52-73
- Patel, A, Islam, SMS, Murray, K & Goonewardene, MS 2015, 'Facial asymmetry assessment in adults using three-dimensional surface imaging', Progress in Orthodontics, vol. 16, no. 1
- Tran, V, Al-Jumaily, A & Islam, S 2019, 'Doppler Radar-Based Non-Contact Health Monitoring for Obstructive Sleep Apnea Diagnosis: A Comprehensive Review', Big Data and Cognitive Computing, vol. 3, no. 1, pp. 3, doi:10.3390/bdcc3010003

GRANTS

- The Higher Education Commission, Government of the Islamic Republic of Pakistan, HEC Scholarship, 2018–2021 ($76,000), Real-Time face detection and recognition for low resolution surveillance videos.
- ECU School of Science Strategic Initiative Fund, 2017 (AUD 135,368), Islam et al., Establishing a 3D sensing, visualisation and analytics lab.
- ECU Industry Engagement Scheme 2019 ($71,664), Dermody G., Janjua J. and Islam SMS, The Implementation of Health-Assistive Smart Home Technology in Independently-Dwelling Older Adults. Industry partner: Bethanie.

Research Interests

- Artificial Intelligence
- Computer Vision/Pattern Recognition
- Machine learning and deep learning
- Medical Image analysis
- 2D/3D image and video data analysis

DR NAEEM KHALID JANJUA

PhD
Email: d.galvao@ecu.edu.au

Naeem Janjua is a tenured faculty at Edith Cowan University (ECU) in Perth, WA. He joined ECU in 2016 as a Lecturer. He works actively in the domain of making informed business decisions (business intelligence) through the use of Web-based intelligent decision support systems and is a recipient of an ARC Linkage grant. He is an Associate Editor for International Journal of Computer System Science and Engineering (IJCSSE) and International Journal of Engineering Intelligent Systems (IJEIS). He has more than 5 years of experience in the information system's design and development in various business environments. He received MS degree in Information Technology from the National University of Science and Technology (NUST), Pakistan; and the PhD in Artificial Intelligence from Curtin University, Perth, Australia, in 2013.

SELECTED PUBLICATIONS

Books

- Janjua, N. K. (2014). A Defeasible Logic Programming-Based Framework to Support Argumentation in Semantic Web Applications (1st ed.). New York: Springer Science & Business Media.

Journal Articles

- Naeem Khalid Janjua, Omar Khadder Hussain, Farookh Hussain, F. K. (2013). Semantic information and knowledge integration through argumentative reasoning to support intelligent decision making. Information Systems Frontiers, 1-26. doi:10.1007/s10796-012-9365-x
- Naeem Khalid Janjua, Farookh Hussain (2012). Web@IDSS - Argumentation-enabled Web-based IDSS for reasoning over incomplete and conflicting information. Knowledge-Based Systems, 32, 9-27. doi:10.1016/j.knosys.2011.09.009
- Naeem Khalid Janjua, Omar Hussain, Farook Hussain, Elizabeth Chang (2014). Philosophical and logic-based argumentation-driven reasoning approaches and their realization on the WWW: A Survey. Computer Journal, 58(9), 1967-1999. doi:10.1093/comjnl/bxu057
- Falak Nawaz, Omar Hussain, Farookh Khadeer Hussain, Naeem Khalid Janjua, Morteza Saberi, Elizabeth Chang. Proactive management of SLA violations by capturing relevant external events in a Cloud of Things environment. Future Generation Computer Systems, Vol 95 (2019), 26-44, ISSN 0167-739X
- Falak Nawaz, Mehdi Rajabi Asadabadi, Naeem Khalid Janjua, Omar Khadeer Hussain, Elizabeth Chang, Morteza Saberi. An MCDM method for cloud service selection using a Markov chain and the best-worst method. Knowledge-Based Systems 159(2018), 120-131. doi:10.1016/j.knosys.2018.06.010.
- Falak Nawaz, Naeem Khalid Janjua, Omar Khadeer Hussain, Elizabeth Chang. Event-driven approach for predictive and proactive management of SLA violations in the Cloud of Things. Future Generation Computer Systems, Vol 84(2018), 78–97 (ERA Rank: A, Impact Factor: 4.639)
- Ahmad Mohsin, Naeem Khalid Janjua. A review and future directions of SOA-based software architecture modeling approaches for System of Systems, Service Oriented Computing and Applications, 2018, in press. doi:10.1007/s11761-018-0245-1 (ERA Rank C, Impact Factor: 1.73)

GRANTS

- Economically Efficient Green Logistics through Cyber Physical Systems, Australian Research Council, Grant - Linkage (Projects), 2016 – 2019, $1,755,951
- The Implementation of Health-Assistive Smart Home Technology in Independently-Dwelling Older Adults , Edith Cowan University, ECU Industry Engagement Grant, 2019 – 2020, $87,664

Research Interests

- Semantic Web
- Argumentation
- Cloud Computing
- Decision Support Systems
- Software Architecture

DR JITIAN XIAO

PhD
Email: j.xiao@ecu.edu.au

Jitian is a Senior Lecturer within the School of Science. He teaches in the areas of data structures, principles of distributed systems, and the fundamentals of software engineering. He is a senior member Institute of Electrical and Electronics Engineers (IEEE) and a member of the Australian Computer Society (ACS). His research interests lie in the database applications, data processing, data mining and big data analytics. He also has a keen interest in the enterprise data security and development of IT professionals.

SELECTED PUBLICATIONS

Book Chapters

- Estrella, S. M. and Masero, J. A. 2007. The use of distal rhynchokinesis by birds feeding in water. Journal of Experimental Biology 210: 3757-3762. (Publication highlighted in "Inside JEB" - section that highlights the key developments in the Journal of Experimental Biology – 210: iii)

Journal Articles

- Zhong, J., Xiao, J., (2017), Enhancing Health Risk Prediction with Deep Learning on Big Data and Revised Fusion Node Paradigm. Journal of Scientific Programming, 2017(2017), Article Number: 1901876, Online, Hindawi, DOI: 10.1155/2017/1901876.
- Zhong, J., Xiao, J., (2015), Design for A Network Centric Enterprise Forensic System. International Journal of Computer Science and Security, 9(4), 196-207, Malaysia, CSC Publishers.

Published Conference Proceedings

- Zhong, J., Xiao, J., (2016), Provide Multilingual Support for Enterprise Systems with Cloud-based Transparent Proxy. Proceedings of 2016 IEEE International Conference of Online Analysis and Computing Science (ICOACS2016), 70-75, Piscataway, USA, Institute of Electrical and Electronics Engineers Inc., DOI: 10.1109/ICOACS.2016.7563051.
- Zhong, J., Xiao, J., (2015), Apply Technology Acceptance Model with Big Data Analytics and Unity Game Engine. Proceedings of 2015 IEEE 6th International Conference on Software Engineering and Service Science, 19-24, IEEE, DOI: 10.1109/ICSESS.2015.7338998.
- Zhong, J., Xiao, J., Zheng, X., (2014), Enhance Enterprise Android Application Security with Cloud Computing and Big Data Analytics. IEEE 7th Joint International Information Technology and Artificial Intelligence Conference, 238-243, Piscataway, N. J., IEEE, DOI: 10.1109/ITAIC.2014.7065042.
- Zhong, J., Xiao, J., (2014), Design for Integrated WiFi Defence Strategy in Modern Enterprise Context. 2014 5th IEEE International Conference on Software Engineering and Service Science (ICSSES), 1(27-29 June 2014), 748-753, Piscataway, N. J., IEEE, DOI: 10.1109/ICSESS.2014.6933675.
- Zhong, J., Xiao, J., (2014), Design for a Cloud-Based Hybrid Android Application Security Assessment Framework. Proceedings 10th International Conference on Reliability, Maintainability and Safety, 1(6-8 Aug 2014), 539-546, IEEE, DOI: 10.1109/ICRMS.2014.7107254.

GRANTS

- Strategies and Approaches to Teaching and Learning Cross Cultures, Office for Learning and Teaching, OLT - Grant (pre-2013), 2008 - 2009, $7,000.
- Intelligent strategies and parallel algorithms for spatial data clustering and join processing, Edith Cowan University, ECU Early Career Researcher - Grant, 2004 - 2006, $14,000.

Research Interests

- Database and applications
- Data mining and web mining
- Decision support Information system and forecasting
- Network application
- Internationalisation

PROFESSOR CRAIG VALLI

DIT, MMIS, BEd, DipTeach
Director, ECU Security Research Institute
Email: c.valli@ecu.edu.au

Professor Craig Valli is the Director of the ECU Security Research Institute and Professor (Digital Forensics) within the School of Science. He has over 25 years experience in the IT Industry and consults to industry and government on network security and digital forensics issues. His main research and consultancy is focussed on securing networks and critical infrastructures, detection of network borne threats and forensic analysis of cyber security incidents. He is also a Fellow of the Australian Computer Society.

SELECTED PUBLICATIONS

Journal Articles

- Chaudhry, J., Qidwai, U., Zeeshan, HM., Valli, C., (2019), Secure Detection of Critical Cardiac Abnormalities for Wireless Body Area Networks. Computer Systems Science and Engineering, article in press(article in press), 11p., Leicester, United Kingdom, CRL Publishing.
- Ibrahim, A., Valli, C., McAteer, I., Chaudhry, J., (2018), A security review of local government using NIST CSF: a case study. Journal of Supercomputing, 74(10), 5171-5186, Springer, DOI: 10.1007/s11227-018-2479-2.
- Yang, W., Wang, S., Zheng, G., Chaudhry, J., Valli, C., (2018), ECB4CI: An Enhanced Cancelable Biometric System for Securing Critical Infrastructures. Journal of Supercomputing, 74(10), 4893-4909, DOI: 10.1007/s11227-018-2266-0.
- Abrar, H., Hussain, S., Chaudhry, J., Saleem, K., Orgun, M., Al-Muhtadi, J., Valli, C., (2018), Risk Analysis of Cloud Sourcing in Healthcare and Public Health Industry. IEEE Access, 6(13 February 2018), 19140-19150, Institute of Electrical and Electronics Engineers Inc., DOI: 10.1109/ACCESS.2018.2805919.
- Yang, W., Wang, S., Hu, J., Zheng, G., Chaudhry, J., Adi, E., Valli, C., (2018), Securing Mobile Healthcare Data: A Smart Card based Cancelable Finger-vein Bio-Cryptosystem. IEEE Access, 6(26 January 2018), 9390-9403, IEEE, DOI: 10.1109/ACCESS.2018.2799522.
- Yang, W., Wang, S., Hu, J., Zheng, G., Valli, C., (2018), A Fingerprint and Finger-vein Based Cancelable Multi-biometric System. Pattern Recognition, 78(June 2018), 242-251, DOI: 10.1016/j.patcog.2018.01.026.
- Chernyshev, M., Valli, C., Johnstone, M., (2017), Revisiting Urban War Nibbling: Mobile Passive Discovery of Classic Bluetooth Devices Using Ubertooth One. IEEE Transactions on Information Forensics and Security, 12(7), 1625-1636, IEEE Signal Processing Society, DOI: 10.1109/TIFS.2017.2678463.
- Baig, Z., Szewczyk, P., Valli, C., Rabadia, P., Hannay, P., Chernyshev, M., Johnstone, M., Kerai, P., Ibrahim, A., Sansurooah, K., Syed, N., Peacock, M., (2017), Future Challenges for Smart Cities: Cyber-Security and Digital Forensics. Digital Investigation, 22(August 2017), 3-13, Oxon, United Kingdom, Elsevier Advanced Technology, DOI: 10.1016/j.diin.2017.06.015.
- Chernyshev, M., Valli, C., Hannay, P., (2016), On 802.11 Access Point Locatability and Named Entity Recognition in Service Set Identifiers. IEEE Transactions on Information Forensics and Security, 11(3), 584 - 593, Piscataway, USA, IEEE, DOI: 10.1109/TIFS.2015.2507542.

GRANTS

- Measuring and Mitigating Vigilance Decrement in Cyber Network Defence Tasks, Cyber Security Research Centre Ltd, Cyber Security Research Centre PhD Scholarship, 2019 - 2022, $225,000.
- Academic Centre of Cyber Security Excellence, Department of Education and Training, Academic Centres of Cyber Security Excellence, 2017 - 2021, $950,287.
- Honeypot Deployment Architecture, Cyber Security Research Centre Ltd, Cyber Security Research Centre MBR Scholarship, 2019 - 2021, $130,000.

Research Interests

- Network Security and Forensics
- Honeypots
- Intrusion Detection Systems
- Internet Misuse
- Computer Clustering (Beowulf)
- Computer Forensics
- Wireless Security
- SCADA Security

ASSOCIATE PROFESSOR PAUL HASKELL-DOWLAND

PhD, BSc (Hons)
Associate Dean, Computing and Security
Email: p.haskelldowland@ecu.edu.au

Paul joined ECU in October 2016 as the Associate Dean (Computing and Security) in the School of Science having held various roles at Plymouth University, UK most recently as the Associate Head (Computing). He maintains a collaborative research relationship with Plymouth University as an associate member of the Centre for Security, Communications & Network Research. His interests include network and system security, teaching and learning technologies, security education and child e-safety. He is the Working Group Coordinator for the International Federation for Information Processing (IFIP) Technical Committee 11 (Security and Privacy Protection in Information Processing Systems), secretary to Working Group 11.1 (Information Security Management) and a member of Working Group 11.12 (Human Aspects of Information Security and Assurance), a Fellow of the UK Higher Education Authority, a Senior Member of the ACS (Certified Professional), a Senior Member of the IEEE, an Honorary Fellow of the Sir Alister Hardy Foundation for Ocean Science and a Fellow of the BCS. He is the author of over 60 papers in refereed international journals and conference proceedings and edited 28 books.

Paul, together with colleagues at Plymouth University, co-invented ICAlert - a managed platform that monitors Internet access targeting users in high-risk environments (e.g. schools) attempting to access inappropriate/illegal content (including radicalisation/terrorist content).

Research Interests

- Information Systems Security
- Security Education
- Learning & Learner Technologies/Analytics

SELECTED PUBLICATIONS

Journal Articles

- Chaudhry, J., Saleem, K., Haskell-Dowland, P., Miraz, M., (2018), A Survey of Distributed Certificate Authorities in MANETs. Annals of Emerging Technologies in Computing (AETiC), 2(3), 11-18, International Association of Educators and Researchers (IAER).
- Korovessis, P., Furnell, S., Papadaki, M., Haskell-Dowland, P., (2017), A toolkit approach to information security awareness and education. Journal of Cybersecurity Education, Research and Practice, 2017(2), article no.5, Kennesaw State University.
- Alharbi, N., Papadaki, M., Haskell-Dowland, P., (2017), The impact of security and its antecedents in behaviour intention of using e-government services. Behaviour and Information Technology, 36(6), 620-636, Taylor & Francis, DOI: 10.1080/0144929X.2016.1269198.
- Al-Bayati, B., Clarke, N., Haskell-Dowland, P., (2016), Adaptive Behavioral Profiling for Identity Verification in Cloud Computing: A Model and Preliminary Analysis. The GSTF Journal on Computing, 5(1), 21-28, Singapore, Global Science and Technology Forum, DOI: 10.5176/2251-3043_4.4.348.
- Zaaba, ZF., Furnell, S., Haskell-Dowland, P., (2016), Literature Studies on Security Warnings Development. International Journal on Perceptive and Cognitive Computing, 2(1), 8-18, Malaysia, International Islamic University Malaysia, DOI: 10.31436/ijpcc.v2i1.22.

GRANTS

- Measuring and Mitigating Vigilance Decrement in Cyber Network Defence Tasks, Cyber Security Research Centre Ltd, Cyber Security Research Centre PhD Scholarship, 2019 - 2022, $225,000.
- Academic Centre of Cyber Security Excellence, Department of Education and Training, Academic Centres of Cyber Security Excellence, 2017 - 2021, $950,287.
- Intelligent Building Security: An investigation into Vulnerabilities, Current Practice and Security Management Best Practice, ASIS International, ASIS - Grant, 2017 - 2018, $79,339.

ASSOCIATE PROFESSOR MIKE JOHNSTONE

PhD, MSc, PGDip, BAppSci, MACS, CP
Email: m.johnstone@ecu.edu.au

Mike is an Associate Professor at the School of Science at Edith Cowan University where he teaches secure programming and advanced software engineering. As a member of the Security Research Institute at ECU his work on Resilient Systems covers secure development methodologies, wireless sensor networks and the security of IoT devices. He provides consultancy services in cyber security for private industry, government and research organisations and has held various IT roles including programmer, systems analyst, project manager and network manager before moving to academia.

SELECTED PUBLICATIONS

Book Chapters:

- Peacock, M., Johnstone, M., Valli, C., (2018). An Exploration of Some Security Issues Within the BACnet Protocol. Information Systems Security and Privacy. 252-272, Springer: Heidelberg.

Journal Articles

- Yang, W., Wang, S., Hu, J., Ibrahim, A., Zheng, G., Macedo, M., Johnstone, M., Valli, C., (2019), A Cancelable Iris- and Steganography-Based User Authentication System for the Internet of Things. Sensors, 19(13), 2985, DOI: https://doi.org/10.3390/s19132985.
- Carpene, C., Johnstone, M., Woodward, A., (2017), The Effectiveness of Classification Algorithms on IPv6 IID Construction. International Journal of Autonomous and Adaptive Communications Systems, 10(1), 15-22, Inderscience.
- Chernyshev, M., Valli, C., Johnstone, M., (2017), Revisiting Urban War Nibbling: Mobile Passive Discovery of Classic Bluetooth Devices Using Ubertooth One. IEEE Transactions on Information Forensics and Security, 12(7), 1625-36, IEEE Signal Processing Society.
- Zubair Baig, Patryk Szewczyk, Craig Valli, Priya Rabadia, Peter Hannay, Maxim Chernyshev, Mike Johnstone, Paresh Kerai, Ahmed Ibrahim, Krishnun Sansurooah, Naeem Syed, Matthew Peacock (2017). Future Challenges for Smart Cities: Cyber-Security and Digital Forensics. Digital Investigation. 22(1), pp. 3-13. Oxon, United Kingdom, Elsevier Advanced Technology, DOI: 10.1016/j.diin.2017.06.015.
- Johnstone, M.N. (2014). Cloud Security meets Telemedicine. Electronic Journal of Health Informatics, Special Issue on e-Health Informatics and Security (8)2. e14.

GRANTS

- Authentication and Authorisation for Entrusted Unions (AU2EU), European Commission, Grant - Seventh Framework Programme (FP7), 2013 - 2015, $584,907
- Academic Centre of Cyber Security Excellence, Department of Education and Training, Academic Centres of Cyber Security Excellence, 2017 - 2021, $950,288.
- Vulnerabilities in Ship Control Systems, Defence Science and Technology Group of the Department of Defence, Grant, 2017 - 2018, $400,000.

Research Interests

- Network Forensics
- Resilient Systems
- Critical Infrastructure Security
- Security of IoT devices
- Secure Development Methodologies

DR MOHIUDDIN AHMED

PhD
Email: mohiuddin.ahmed@ecu.edu.au

Mohiuddin Ahmed attained his PhD in Computer Science from UNSW Australia. In PhD, he has made practical and theoretical contributions in big data analytics (summarization) for a number of application domains. Mohiuddin's research has a high impact on data analytics, critical infrastructure protection (IoT, smart grids), information security against DoS attacks, false data injection attacks, etc. and digital health. He is currently working as a Lecturer in Computing and Security Sciences in the School of Science at Edith Cowan University (ECU), Australia. Prior to joining ECU, he served as a Lecturer in the Centre for Cyber Security and Games at Canberra Institute of Technology (CIT) and was also involved with CIT's Data Strategy Working Group.

He is currently exploring blockchain for ensuring security of healthcare devices securing the prestigious ECU Early Career Researcher Grant. Mohiuddin has edited a book on Data Analytics published by CRC press, USA. Previously, he has worked in the areas of text mining and predictive analytics in the artificial intelligence division at MIMOS, Malaysia. Currently, Mohiuddin is editorial advisory board member of Cambridge Scholars Publishing Group in UK and Associate Editor of the International Journal of Computers and Applications (Taylor & Francis Group).

SELECTED PUBLICATIONS

Journal Articles

- Ahmed, M., (2019), Data summarization: a survey. Knowledge and Information Systems, 58(2), 249-273, DOI: 10.1007/s10115-018-1183-0.
- Ahmed, M., Barkat, A., (2019), Infrequent pattern mining in smart healthcare environment using data summarization. Journal of Supercomputing, 74(10), 5041-5059, DOI: 10.1007/s11227-018-2376-8.
- Ahmed, M., (2019), Intelligent Big Data Summarization for Rare Anomaly Detection. IEEE Access, 7(1), 68669 - 68677, DOI: 10.1109/ACCESS.2019.2918364.
- Yang, J., Hasan Onik, MM., Lee, N., Ahmed, M., Kim, C., (2019), Proof-of-Familiarity: A Privacy-Preserved Blockchain Scheme for Collaborative Medical Decision-Making. MDPI Applied Sciences , 9(7), 1-24, Switzerland.
- Ahmed, M., (2018), Reservoir-based network traffic stream summarization for anomaly detection. Pattern Analysis and Applications, 21(2), 579-599, DOI: 10.1007/s10044-017-0659-y.
- Ahmed, M., (2017), Thwarting DoS Attacks: A Framework for Detection based on Collective Anomalies and Clustering. Computer, 50(9), 76-82, DOI: 10.1109/MC.2017.3571051.
- Ahmed, M., Mahmood, A., Hu, J., (2016), A survey of network anomaly detection techniques. Journal of Network and Computer Applications, 60, , 19-31, DOI: 10.1016/j.jnca.2015.11.016.
- Ahmed, M., Mahmood, A., Islam, MR., (2016), A survey of anomaly detection techniques in financial domain. Future Generation Computer Systems: the international journal of grid computing: theory, methods and applications, 55(1 February 2016), 278-288, DOI: 10.1016/j.future.2015.01.001.

GRANTS

- Securing Internet of Medical Things against False Data Injection Attacks Using Blockchain, Edith Cowan University, ECU Early Career Researcher Grant - 2019, 2019 - 2020, $25,000.

Research Interests

- Cyber Security
- Data Analytics
- Machine Learning
- Blockchain
- Healthcare

DR JAMES JIN KANG

PhD
Email: james.kang@ecu.edu.au

James has worked in the areas including Health Informatics, IohT (Internet of Health Things), Cybersecurity and Disaster Recovery using smart sensors in low power wide area networks. He has worked in telecommunications industry for over 25 years with projects in Telecom NZ (Spark NZ), Nokia (Alcatel-Lucent), NBN Co, Telstra, Siemens and Vodafone Australia. He has specialised in Network Intelligence for wired and mobile networks during the earlier stages of his career, and later worked on career networks such as IP, IMS, NBN and VoIP technologies. He has recently went to Africa as a volunteer IT advisor sponsored by the Australian government (DFAT) to help NGOs and plans to teach in developing countries as a volunteer in the future.

SELECTED PUBLICATIONS

Book Chapters

- Kang, J. J., & Adibi, S. (2015). A Review of Security Protocols in mHealth Wireless Body Area Networks (WBAN). In W. Zhou, & R. Doss (Eds.), Future Network Systems and Security 2015 (FNSS 2015) Vol. 523 (pp. 61-83). Paris, France: Springer International Publishing. doi:10.1007/978-3-319-19210-9_5

Journal Articles

- Kang, J. J., Parvin, S., Fahd, K., Venkatraman, S. (2019). Vehicular Alarm System Using mHealth Data and Lightweight Security Algorithms. Technologies. In press.
- Kang, J. J., Fahd, K., Venkatraman, S. (2019). An Enhanced Inference Algorithm for Data Sampling Efficiency and Accuracy Using Periodic Beacons and Optimization. Big Data and Cognitive Computing, 3(1). doi:10.3390/bdcc3010007
- Kang, J. J., Fahd, K., Venkatraman, S. (2018). Trusted Time-Based Verification Model for Automatic Man-in-the-Middle Attack Detection in Cybersecurity. Cryptography, 2(38). doi:10.3390/cryptography2040038.
- Kang, J. J., & Adibi, S. (2018). Systematic Predictive Analysis of Personalized Life Expectancy Using Smart Devices. Technologies, 6(3), 74. doi:10.3390/technologies6030074
- Kang, J. J., & Larkin, H. (2017). Application of an Emergency Alarm System for Physiological Sensors Utilizing Smart Devices. MDPI Technologies 2017. Vol. 5. doi:10.3390/technologies5020026
- Kang, J. J., Adibi, S. (2017). Bushfire Disaster Monitoring System using Low Power Wide Area Networks (LPWAN). MDPI Technologies 2017. Vol. 5(4). doi:10.3390/technologies5040065
- Kang, J. J., & Larkin, H. (2016). Inference of Personal Sensors in the Internet of Things. International Journal of Information, Communication Technology and Applications, [S.l.], v. 2, n. 1, p. 1-23, Jan. 2016. ISSN 2205-0930. doi:10.17972/ijicta20162125

Research Interests

- Cybersecurity
- Health Informatics
- Sensor Networks
- IoT/Internet of Health Things
- Disaster Recovery Networks

DR AHMED IBRAHIM

PhD
Email: a.ibrahim@ecu.edu.au

Dr Ahmed Ibrahim holds a PhD in the area of Cyber Security, a Master of Computer Security, and a Bachelor of Science First Class Honours in Computing. He is a Lecturer in the Computer and Security discipline in the School of Science where he teaches units related to Network Security. He is also the coordinator for the Bachelor of Science (Cyber Security) course.

He is an active member of the ECU Security Research Institute and researches a broad range of topics and supervises projects under the Cyber Security Cooperative Research Centre (CSCRC).

He currently supervises several PhD candidates in Cyber Security centric topic areas such as: Internet of Things, Cyber Physical Systems, OT Security, NLP, Sentiment Analysis, and Cryptography.

Dr Ahmed Ibrahim has a keen interest in research and projects aligned with industry. He has worked in the industry at various capacities and some of his notable industry engagements include vulnerability assessments, security architecture reviews, security audits, website security assessments, desktop reviews, and critical infrastructure evaluations for the federal/state/local government and critical infrastructure providers.

SELECTED PUBLICATIONS

Book Chapters

- Syed, N., Ibrahim, A., Baig, Z., Valli, C., (2019), Bio-inspired Cyber-Security for the Smart Grid. Nature-Inspired Cyber Security and Resiliency: Fundamentals, Techniques and Application, 373-392, Electronic, Institution of Engineering and Technology, DOI: 10.1049/PBSE010E_ch14.

Journal Articles

- McAteer, I., Ibrahim, A., Zheng, G., Yang, W., Valli, C., (2019), Integration of Biometrics and Steganography: A Comprehensive Review. Technologies, 7(2), 34, Switzerland, DOI: 10.3390/technologies7020034.
- Yang, W., Wang, S., Hu, J., Ibrahim, A., Zheng, G., Macedo, M., Johnstone, M., Valli, C., (2019), A Cancelable Iris- and Steganography-Based User Authentication System for the Internet of Things. Sensors, 19(13), 2985, DOI: https://doi.org/10.3390/s19132985.
- Ibrahim, A., Valli, C., McAteer, I., Chaudhry, J., (2018), A security review of local government using NIST CSF: a case study. Journal of Supercomputing, 74(10), 5171-5186, Springer, DOI: 10.1007/s11227-018-2479-2.
- Baig, Z., Szewczyk, P., Valli, C., Rabadia, P., Hannay, P., Chernyshev, M., Johnstone, M., Kerai, P., Ibrahim, A., Sansurooah, K., Syed, N., Peacock, M., (2017), Future Challenges for Smart Cities: Cyber-Security and Digital Forensics. Digital Investigation, 22(August 2017), 3-13, Oxon, United Kingdom, Elsevier Advanced Technology, DOI: 10.1016/j.diin.2017.06.015.

GRANTS

- Prediction of radicalisation through the Internet in the Maldives using linguistics and machine learning, Maldives National Defence Force, Industry Engagement Scholarship to support PhD projects, 2019 - 2024, $35,000.
- Vulnerabilities in Ship Control Systems, Defence Science and Technology Group of the Department of Defence, Grant, 2017 - 2018, $400,000.
- Investigation of social media for radicalisation and terrorism in the Maldives, Edith Cowan University, Edith Cowan University, School of Science Collaborative Research Grant Scheme, 2016 – 2017, 2017, $11,000.

Research Interests

- Internet of Things (IoT) and Industrial Control Systems (ICS) Security
- Cyber Security and Risk Assessment Frameworks
- Threat and Intrusion Detection (SIEM and IDS)
- Detection of Radical Content on Social Media and Internet
- Investigation of Covert Communication and Steganography

DR LESLIE FRANK SIKOS

PhD
Email: l.sikos@ecu.edu.au

Leslie F Sikos, PhD, is a computer scientist specialising in network forensics and cybersecurity applications powered by artificial intelligence and data science. He has worked both in academia and the industry, and is a certified system professional in Watchguard firewall management. He is an active member of the research community as an author, editor, reviewer, conference session organiser, and speaker. Dr Sikos authored more than 20 books, including textbooks and monographs, and regularly edits Springer volumes in his areas of expertise.

SELECTED PUBLICATIONS

Books

- Sikos, L. F. (ed.) (2018) AI in Cybersecurity. Cham, Switzerland: Springer. DOI: 10.1007/978-3-319-98842-9

Book Chapters

- Sikos, L. F. (2019) Knowledge Representation to Support Partially Automated Honeypot Analysis Based on Wireshark Packet Capture Files. In: Czarnowski, I., Howlett, R. J., Jain, L. C. (eds.) Intelligent Decision Technologies 2019, vol. 1, pp. 345–351. Springer, Singapore. DOI: 10.1007/978-981-13-8311-3_30
- Sikos, L. F., Stumptner, M., Mayer, W., Howard, C., Voigt, S., Philp, D. (2018) Automated Reasoning over Provenance-Aware Communication Network Knowledge in Support of Cyber-Situational Awareness. In: Liu, W., Giunchiglia, F., Yang, B. (eds.) Knowledge Science, Engineering and Management, pp. 132–143. Cham, Switzerland: Springer. DOI: 10.1007/978-3-319-99247-1_12

Journal Articles

- Sikos, L. F., Stumptner, M., Mayer, W., Howard, C., Voigt, S., Philp, D. (2018) Representing Network Knowledge Using Provenance-Aware Formalisms for Cyber-Situational Awareness. Procedia Computer Science 126:29–38. DOI: 10.1016/j.procs.2018.07.206

Published Conference Proceedings

- Sikos, L. F. (2018) Handling Uncertainty and Vagueness in Network Knowledge Representation for Cyberthreat Intelligence. In: Proceedings of the 2018 IEEE International Conference on Fuzzy Systems (FUZZ-IEEE) (part of the 2018 IEEE World Congress on Computational Intelligence). Piscataway, NJ, USA: IEEE. DOI: 10.1109/FUZZ-IEEE.2018.8491686

Research Interests

- Cybersecurity
- Digital Forensics
- Artificial Intelligence
- Data Science

DR PATRYK SZEWCZYK

PhD
Email: p.szewczyk@ecu.edu.au

Dr Patryk Szewczyk is a cyber security and digital forensics lecturer within the School of Science and a researcher in the ECU Security Research Institute. Patryk has presented locally and internationally on topics pertaining to; end-user cyber security awareness and education, cyber security hygiene, broadband router security challenges, and remnant data on consumer electronics. He has won awards for research into broadband router security, and used his research to support law enforcement in investigative challenges.

SELECTED PUBLICATIONS

Journal Articles

- Szewczyk, P., Sansurooah, K., Williams, T., (2018), An Australian Longitudinal Study Into Remnant Data Recovered From Second-Hand Memory Cards. International Journal of Information Security and Privacy, 12(4), 82-97
- Baig, Z., Szewczyk, P., Valli, C., Rabadia, P., Hannay, P., Chernyshev, M., Johnstone, M., Kerai, P., Ibrahim, A., Sansurooah, K., Syed, N., Peacock, M., (2017), Future Challenges for Smart Cities: Cyber-Security and Digital Forensics. Digital Investigation, 22(August 2017), 3-13
- Szewczyk, P., Macdonald, R., (2017), Broadband Router Security: History, Challenges and Future Implications. Journal of Digital Forensics, Security and Law, 12(4), Article 6, Florida, Association of Digital Forensics, Security and Law

Published Conference Proceedings

- Szewczyk, P., Blackman, D., Sansurooah, K., (2017), An Analysis of Unauthorized Wireless Network Usage in Western Australia. Proceedings of the Eleventh International Symposium on Human Aspects of Information Security & Assurance (HAISA 2017)
- Sansurooah, K., Szewczyk, P., Blackman, D., (2016), Unauthorised Wireless Network Access Attempts in Western Australia. 2016 International Conference on Computational Science and Computational Intelligence Proceedings, 999-1004, Los Alamitos, USA, IEEE Computer Society
- Hampton, N., Szewczyk, P., (2015), A survey and method for analysing SoHo router firmware currency. Proceedings of the 13th Australian Information Security Management Conference
- Szewczyk, P. (2011). Usability of Internet Security Software: Have They Got it Right? Proceedings of the 5th International Conference on Network and System Security, Milan, Italy
- Szewczyk, P., Valli, C. (2010). Ignorant Experts: Computer and Network Security Support from Internet Service Providers. Proceedings of the 4th International Conference on Network and System Security, Melbourne, Victoria

Research Interests

- Digital forensics
- Information Security
- Human Computer Interaction (HCI) - Security
- Cyber security challenges and education
- Cyber security usability

APPLYING TO ECU

Getting ready to apply for a research degree can seem quite daunting so we've laid out the following process to assist you. We recommend that you complete your application four to six weeks prior to any deadline. An incomplete application will result in delays, which means you could potentially miss deadlines, so make sure that your application is complete before submitting it.

CHECK YOUR DATES

Masters by Research courses and the Integrated PhD have a specific start date and application deadlines. However, applications for the standard PhD are open all year round. Keep in mind that ECU's Research Scholarships also have opening and closing dates. If you are interested in applying for a scholarship, visit the Scholarships website: **ecu.edu.au/scholarships**

KNOW YOUR TOPIC

You will need to prepare a 300-word abstract and a two-page proposal on your topic. Your initial abstract and proposal will tell us about you, including how much you know about ECU, research in your area of study, how passionate you are about your subject, and how familiar you are with the prospective supervisors within the schools.

PREPARE YOUR DOCUMENTS

In addition to your abstract and proposal, you will need to submit the following:

- Academic certificate transcripts (secondary and/ortertiary studies) in both the original language and official certified English translation (if applicable)
- English proficiency test scores
- Copy of passport photo page (if applicable)
- Résumé/Curriculum vitae (if applicable)
- Work reference (if applicable)
- Marriage or name change certificate (if applicable)
- Copies of your Honours or Masters Thesis, as well as any publications you have produced

APPLY DIRECTLY TO ECU OR THROUGH AN AGENT

Visit the Application Portal: **apply.ecu.edu.au** to apply for your course, including uploading your documents. You can also track the progress of your application here.

Please note that ECU requires certain nationalities to apply via an authorised agent. Visit **ecu.edu.au/future-students/applying/find-an-authorised-agent** to find an agent near you.

RECEIVE OUR INITIAL ASSESSMENT

The initial assessment will take into account your qualifications, topic, abstract and proposal to ensure it is closly aligned with our areas of research focus, and that we have supervisors in your research area. This can take four to six weeks, depending on academic availability. Please note that during December and January this process may take longer.

We will communicate with you via email, so it is important for you to check your email regularly to ensure there are no delays with your application.

PROGRESS YOUR APPLICATION

If your application satisfies all our criteria, it will be progressed for further assessment. At this stage your qualifications will be verified and a research supervisor will be assigned to you. Processing time for the assessment of your application will vary based on academic availability.

OUTCOME OF YOUR APPLICATION

You will be advised of the outcome of your application via email. If you are successful, you will receive an offer to commence your studies at ECU.

ACCEPT YOUR OFFER

Your offer letter will contain specific instructions as to how to accept your offer via our online system.

If you have questions about your application, contact Admissions: HDR.enquiries@ecu.edu.au

SCIENCE

**THERE IS
WHERE YOU ARE
RIGHT NOW,
AND
THERE IS WHERE
YOU WANT
TO GET TO.
IN BETWEEN
YOU NEED A BRIDGE.
ECU IS THAT
BRIDGE BETWEEN
YOUR WORLD,
AND THE
WHOLE WORLD.**

BECOME WORLD READY AT ECU.

CONTACT

P 134 328

P (61 8) 6304 0000 (outside Australia)

E futurestudy@ecu.edu.au

W ecuworldready.com.au

Find us at

ECUjourney

edithcowanuni

edithcowanuniversity

ECU IS SMOKE-FREE

CRICOS IPC 00279B GRS 07/19