Ulster University

School of Computing, Engineering, and Intelligent Systems

Research and Innovation Annual Report
1 August 2023 - 31 July 2024

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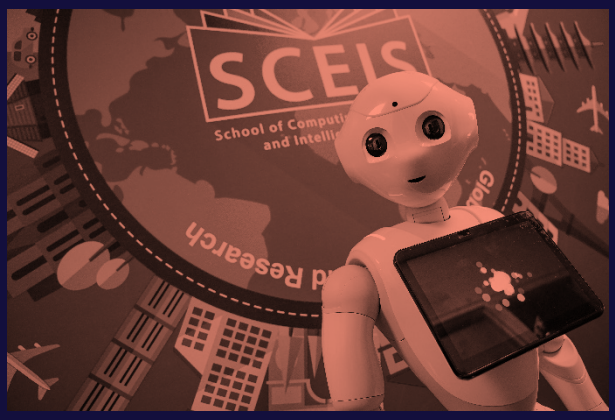
CONTENTS



1. FOREWORD

Research Director
Prof. Liam McDaid

In presenting the Annual Report for the School of Computing, Engineering, and Intelligent Systems (SCEIS) for the academic year 2023-2024, I am delighted to report that the Intelligent Systems Research Centre (ISRC), which oversees research within SCEIS, continues to generate internationally excellent outputs in areas such as Robotics, Computational Materials, Neurotechnology, Intelligent Data Analytics, Neuromorphic Computing and Bio-Inspired AI research. Within SCEIS there are approximately 42 academics, 44 PhD students and 39 externally funded research associates working across a range of projects and in the last year the number of research outputs was in excess of 140 peer reviewed high impact publications. These outputs, along with over £2M in research funding, places SCEIS in an excellent position for a favourable REF2029 outcome: funders included Innovate UK, Invest NI, DfE, British Academy, EPSRC, BBSRC. Currently we are reviewing the quality of these outputs, and Impact Case Studies (ICSs) are evolving across a wide range of subject areas under the guidance of the faculty impact manager.

The outline business case for the Cognitive Analytics & Digital Robotics Innovation Centre (CADRIC) City and Growth Deal within the SCEIS has been approved. Progress is now focused on appointing the architectural consultants in the development of the CADRIC building which will be co-located with the existing ISRC building. CADRIC comprises of the Cognitive Analytics Research Laboratory (CARL) and the Centre for Industrial Digitalisation and Robotics Automation (CIDRA) and both CARL and CIDRA will have a shared space in which staff from industry can co-locate with researchers, Centre Directors, Business/Marketing Managers, Challenge Fund Managers, Engineers, Technicians and administrative support. CARL will apply novel intelligent techniques to a broad range of sectors while CIDRA has a specific focus on the application of AI in smart robotic systems to advance manufacturing and additive manufacturing.

The Smart Manufacturing Data Hub (SMDH) has been a catalyst for the UK's manufacturing industry, empowering businesses to harness the power of data. By providing access to valuable data, analytics tools and expert support, SMDH has helped manufacturers improve efficiency, boost productivity and foster innovation. Established in April 2022, and now with a core team of approximately 100 staff, project delivery has been ongoing with over 150 SME digital intervention projects completed and an additional 100 currently underway and to be completed by March 2025 covering 33 manufacturing sectors. The Ulster team has distributed £5M in digitalisation funding to over 50 SMEs and technology providers to deploy commercial digitalisation solutions that feed data directly into the SMDH Manufacturing Data Exchange Platform (MDEP). Over 500 IoT devices have been installed in manufacturing companies and over 200 companies have contributed their manufacturing data to MDEP. The project has developed over 40 novel technological solutions to assist SMEs on the digitalisation journey. Other outputs of note include over 60 peer-reviewed publications aligned with the project, 140 SMDH in-person and online events, and social media reach approaching 150k. The work of SMDH has not only benefited individual companies but also

contributed to the UK's overall economic growth and competitiveness on the global stage and raised the profile of Ulster in leading in the delivery of these benefits.

The Smart NanoNI project is continuing to develop game-changing advanced prototyping and smart manufacturing methods to deliver new intelligent technologies and facilitate fabrication of Smart Nano products. Capitalising on the advances and innovations associated with industrial digitisation, large data availability, acceleration in AI capability, robotics and automation, our contribution involves extensive collaboration with Seagate Technology. This collaboration aims to develop and apply digital twin supported AI approaches to address challenges associated with optimisation, routing and scheduling to reduce product development cycle times, predictive analytics for tool matching and understanding tool health, extracting and classifying information from complex unstructured datasets and robotic automation. The project work was undertaken by a team of six PhD students and two and a half PDRAs. Four PhD students have successfully completed their PhD confirmation viva and presented conference papers. The fifth PhD student has very recently joined, and Smart Nano will recruit one more PDRA and a project manager for the remaining time of the project.

The Artificial Intelligence Collaboration Centre (AICC) is a joint project between Ulster University and QUB and started in September 2024 with a duration of five years. AICC was jointly funded (£16.3M) by DFE and Invest NI and its objective is to provide access to specialist expertise, education, skills and training to accelerate AI-powered solutions to local businesses. Currently staff consists of a director, operations manager, marketing officer, events coordinator and admin support is also in place. Research expertise in the form of data scientists and applied researcher were recently appointed and in the next quarter AICC will recruit a deputy director of AI technology and research services, a deputy director of business engagement and a head of AI and digital ethics policy. Support is current being given to an Alpha Cohort of 12 businesses ranging from architects, manufacturing, legal tech, cyber security and Health and wellbeing, and AICC will shortly be providing support in health and life sciences. AICC aims to fund almost 400 postgraduate qualifications over its lifetime split equally between Ulster and QUB. It is worth noting that the LinkedIn following has grown steady over the past few months and now sits at just over 1200.

“[T]he Intelligent Systems Research Centre (ISRC) […] continues to generate internationally excellent outputs in areas such as Robotics, Computational Materials, Neurotechnology, Intelligent Data Analytics, Neuromorphic Computing and Bio-Inspired AI research.”

The Hartree Northern Ireland (NI) Hub is based at the Ulster University Magee campus and focuses on delivering impactful projects that drive innovation and digital transformation for Northern Ireland’s SMEs. Hartree has grown to a team of eight made up of three data scientists, three directors, an executive assistant, and a programme manager. Since its launch in September 2024 the Hub has engaged with and supported over 100 companies through numerous workshops, assists and projects, across diverse sectors which includes advanced manufacturing, digital industries, agri-tech, life and health sciences and fintech. These initiatives have enabled businesses to adopt AI and data-driven solutions, delivering measurable value and fostering growth. Additionally, 8 new projects are currently in progress. Looking ahead, the Hartree NI Hub remains committed to expanding its reach and impact, prioritising tangible outcomes over theoretical engagements to empower Northern Ireland’s business landscape.

The ISRC Computational Neuroscience, Neurotechnology, and Neuro-inspired AI Summer School (ISRC-CN3), hosted by SCEIS, ran for the fourth time in August 2024. This 5-day event provided an immersive educational experience designed to train the next generation of researchers on state-of-the-art developments in computational neuroscience, neurotechnology and neuro-inspired artificial intelligence. ISRC-CN3 successfully brought together 104 participants, including students, researchers, and professionals, fostering collaboration and knowledge exchange across 22 countries, 50 universities, and organizations. Notably, 38% of participants identified as female, and 1% identified as non-binary, reflecting a commitment to inclusivity and diversity. The multidisciplinary curriculum offered participants a unique opportunity to engage with topics at the intersection of neuroscience and AI and practical lab sessions provided attendees with real-world experience in cutting-edge areas such as brain-computer interfaces and neurotechnology. Keynote addresses delivered by top-tier international experts addressed themes like the ethical implications of AI in healthcare and the latest advancements in neuro-inspired AI and brain-computer interfaces.

This diverse curriculum ensured a balance between theoretical knowledge and practical application, equipping participants with both foundational insights and hands-on skills. Attendees shared positive feedback about their experiences, highlighting the program's comprehensive scope and practical focus. The success of this year's program highlights SCEIS ongoing commitment to fostering excellence and innovation in these transformative fields. In addition to the ISRC_CN3 the SCEIS also hosted an NIHPC conference in November 2024 with high profile speakers from Cambridge HPC and Nvidia. The event was attended by over 60 delegates.

"[W]e look forward to another exciting year that will capitalise on our successes to build new high quality research capacity within SCEIS that can positively impact regionally, internationally, and globally."

There have been major contributions from individual staff and researchers across SCEIS in securing and managing the projects outlined above and in undertaking new and exciting research activities. I would like to take this opportunity to thank everyone for the collective effort in achieving these successes. As we publish this report, we look forward to another exciting year that will capitalise on our successes to build new high quality research capacity within SCEIS that can positively impact regionally, internationally, and globally.

Further details of our research, facilities, staff profiles and research expertise can be found at: Intelligent Systems Research Centre or by contacting **Louise Gallagher** (Academic Excellence Executive Assistant) at **Email:** l.gallagher@ulster.ac.uk **Tel:** +44 28 7167 5148.

Professor Liam McDaid
Research Director, School of Computing, Engineering and Intelligent Systems

2. RESEARCH STUDENTS

NAME	PROJECT TITLE
Ahmed, Salman	Transforming IT Operations: Harnessing Natural Language Processing and Transformers in AIOps
Ansari, Nishath	Robotics and AI Technologies for Heart Health Screening
Brennan, Rosie	Virtual Reality and Games for Physical Rehabilitation
Browne, Dylan	Development of Process Planning Strategies for Robotic WAAM Metal Deposition
Chavan, Sayali	Computer vision for advertising analytics
Devlin, Sophia	Robotics and AI Technologies for Heart Health Screening
Doherty, John	Autonomous Object Recognition for Robots
Dowds, Carole	Computational Biophysical Modelling of Motor Neuron Disease
Fotouhi, Ramin	Image Labelling in Computer Vision
Gambale, Antonio	Cobots for Smart Manufacturing
Gorman, Mark	Utilising multivariate high frequency time series datasets for real-time decision-making applications
Hamilton, Natasha	Exploiting Brain Inspired Information Processing in Hardware to Develop Highly Reliable, Always-on Smart Sensor Systems.
Harkin, David	AI-based Algorithms for Medical Image Processing
Henderson, Benn	Automated Classification of Autism Spectrum Disorder in Children using Gait Analysis
Henderson, Jeffrey	Artificial Intelligence for Smart Sensing to facilitate better health
Ijaz, Yasir	Computer Vision for Cobotics and Smart Manufacturing
Jha, Ravi	Quantum Enhanced Brain-Inspired Mathematical and Computational Models of Spiking Neural Networks for Deep Learning of Spatio-Temporal Data
Komijani, Hossein	Deep Learning Retinal Image Analysis for Human Disease Prediction
Lenfesty, Brendan	Computational Modelling and Machine Learning in Decision Neuroscience

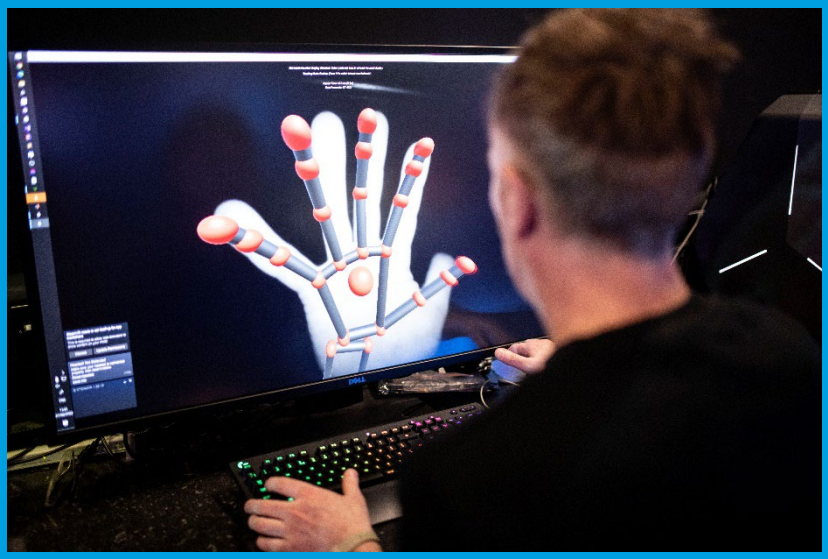
Madden, Kyle	Secure Networks-on-Chip (NoC) for cyber-physical systems.
McAllister, James	Discovering the rules of neural learning by computer simulations of brain biophysics and deep neural networks
McCready, Kevin	Adaptive Robotics for Smart Manufacturing Environments
McShane, Niall	Augmented Reality Brain-computer Interface
Melaugh, Melissa	Machine Learning and Environmental DNA Metagenomics for Advanced Forest Health Surveillance
Millar, Christopher	Kinaesthetic learning for robotic object manipulation.
Qiu, Senhui	EyeSee: A Fast and energy-efficient deep learning model for semantic segmentation in self-driving cars
Rahman, Mohammad Sharifur	AI in Smart Semiconductor Manufacturing
Rasheed, Muhammad	Machine Vision for Anomaly Detection
Robinson, Jonathan	CareBot: A Deep Learning based Multimodal Social Interaction Robot for Elderly Care
Robinson, Tony	FPGA Computational Acceleration in Genomics – bringing personalised medicine closer to clinical practice for healthy communities
Saha, Sanjoy Kumar	SmartNanoAI - AI in Smart Manufacturing: Integrating AI for key performance input and output variable (KPIV) analytics
Samanta, Kaniska	A Transferable Brain-Computer Interfacing based Status Monitoring System to Augment Motor Imagery based Neurorehabilitation
Saranirad, Vahid	George Moore PhD scholarship in Intelligent Data Analytics: Enhancing biological plausibility of deep learning for computer vision
Simpson, David	Brain-inspired Autonomous Learning for Resilient Electronic Systems
Sood, Ashima	Extended Reality Workplace Meeting Solution
Tahernezhadjavazm, Farajollah	Evolutionary strategies for optimising signal and text classification
Venezia, Samuel	SPRINT: Smart Sports Video Analytics

GRADUATED DEC 2023

NAME	PROJECT TITLE
Poshtkohi, Alireza	Computational Modelling of Plasma Membrane Electrophysiology and Calcium Dynamics in Microglia

GRADUATED JULY 2024

NAME	PROJECT TITLE
Gillespie, James	Learning Bio-Inspired Movement in Highly Noisy Environments
Javed, Aqib	Intelligent Hotspot Prediction in Networks-On-Chip Using Spiking Neural Networks
Khodadadzadeh, Massoud	Refined Capsule Network Architectures for Data Classification and Knowledge Discovery
Liu, Shuo	Efficient Level Set Method for Novelty Detection
McKinney, Joseph	Design And Development of a Unique Six Degrees of Freedom Prototype Virtual Reality Mirror Therapy System Tool for Upper Limb Stroke Rehabilitation (MINERVA) [MPhil]



3. RESEARCH OUTPUTS

This section reports those outputs published and/or delivered over the period of this report and classified as either: journal articles, books/chapters in books, research reports, published conference papers, or live conference contributions. https://pure.ulster.ac.uk/.

3.1. JOURNAL ARTICLES

Abdullayev, K, Gorvett, O, Sochiera, A, Laidlaw, L, Chico, T, Manktelow, M, Buckley, O, Condell, J, Van Arkel, R & Diaz, V et al. 2024, 'Stakeholder perspectives on contributors to delayed and inaccurate diagnosis of cardiovascular disease and their implications for digital health technologies: a UK-based qualitative study', BMJ Open, vol. 14, no. 5, e080445, pp. 1-12. https://doi.org/10.1136%2Fbmjopen-2023-080445

AbouHassan, I, Kasabov, NK, Jagtap, V & Kulkarni, P 2023, 'Spiking neural networks for predictive and explainable modelling of multimodal streaming data with a case study on financial time series and online news', Scientific Reports, vol. 13, no. 1, 18367, pp. 1-14. https://doi.org/10.1038/s41598-023-42605-0

Akamatsu, S, Bottin-Rousseau, S, Witusiewicz, VT, Hecht, U, Plapp, M, Ludwig, A, Mogeritsch, J, Şerefoğlu, M, Bergeon, N & Mota, FL et al. 2023, 'Microgravity studies of solidification patterns in model transparent alloys onboard the International Space Station', npj Microgravity, vol. 9, no. 1, 83, pp. 1-12. https://doi.org/10.1038/s41526-023-00326-8

Alam, G, McChesney, I, Nicholl, P & Rafferty, J 2023, 'Open Data Sets in Human Activity Recognition Research - Issues and Challenges: A Review', IEEE Sensors Journal, vol. 23, no. 22, pp. 26952-26980. https://doi.org/10.1109/jsen.2023.3317645

Ali, A, Dunlop, P, Coleman, S, Kerr, D, McNabb, R & Noormets, R 2023, 'Glacier area changes in Novaya Zemlya from 1986-89 to 2019-21 using object-based image analysis in Google Earth Engine', Journal of Glaciology, vol. 69, no. 277, pp. 1-12. https://doi.org/10.1017/jog.2023.18

Ali, A, Dunlop, P, Coleman, S, Kerr, D, McNabb, R & Noormets, R 2023, 'Glacier area changes in the Arctic and high latitudes using satellite remote sensing', Journal of Maps, vol. 19, no. 1, 2247416, pp. 1-7. https://doi.org/10.1080/17445647.2023.2247416

Ananthakrishnan, B, Shaik, A, Prasad, A & Yogarajah, P 2024, 'On-road obstacle detection in real time environment using an ensemble deep learning model', Signal, Image and Video Processing, vol. 18, no. 6-7, pp. 5387-5400. https://doi.org/10.1007/s11760-024-03241-x

Anderson, C, Bucholc, M, McClean, PL & Zhang, S-D 2023, 'The Potential of a Stratified Approach to Drug Repurposing in Alzheimer's Disease', Biomolecules, vol. 14, no. 1, pp. 1-26. https://doi.org/10.3390/biom14010011

Asadpour, A, Tan, H, Lenfesty, B & Wong-Lin, K 2024, 'Of rodents and primates: Time-variant gain in drift-diffusion decision models', Computational Brain & Behavior, vol. 7, no. 2, pp. 195-206. https://doi.org/10.1007/s42113-023-00194-1

Ashcroft, K, Robinson, T, Condell, J, Penrpaze, V & Bird, S 2023, 'An Investigation of Surface EMG Shorts-Derived Training Load during Treadmill Running', Sensors, vol. 23, no. 15, pp. 1-13. https://doi.org/10.3390/s23156998

Barman, T & Deka, B 2024, 'A Deep Learning-based Joint Image Super-resolution and Deblurring Framework', IEEE Transactions on Artificial Intelligence, vol. 5, no. 6, pp. 3160-3173. https://doi.org/10.1109/tai.2023.3343319

Bullock, S, Ajmeri, N, Batty, M, Black, M, Cartlidge, J, Challen, R, Chen, C, Chen, J, Condell, J & Danon, L et al. 2024, 'Artificial Intelligence for Collective Intelligence: A National- Scale Research Strategy', The Knowledge Engineering Review, pp. 1-24.

Cecotti, H, Leray, M & Callaghan, M 2024, 'Countdown VR: a Serious Game in Virtual Reality to Develop Mental Computation Skills', IEEE Transactions on Games, vol. 14, no. 8, pp. 1-12. https://doi.org/10.1109/TG.2024.3357452

Chaurasia, P, McClean, SI, Mahdi, AA, Yogarajah, P, Ansari, JA, Kunwar, S & Ahmad, MK 2023, 'Automated lead toxicity prediction using computational modelling framework', Health Information Science and Systems, vol. 11, no. 1, 56, pp. 1-22. https://doi.org/10.1007/s13755-023-00257-4

Chowdary, J, G, S, M, P & Yogarajah, P 2023, 'Nucleus Segmentation and Classification using Residual SE-UNet and Feature Concatenation Approach in Cervical Cytopathology Cell images', Technology in Cancer Research and Treatment, vol. 22, pp. 1-14. https://doi.org/10.1177/15330338221134833

Chui, KT, Gupta, BB, Chaurasia, P, Arya, V, Almomani, A & Alhalabi, W 2023, 'Three-stage data generation algorithm for multiclass network intrusion detection with highly imbalanced dataset', International Journal of Intelligent Networks, vol. 4, pp. 202-210. https://doi.org/10.1016/j.ijin.2023.08.001

Das, A, Hoque, MM, Sharif, O, Dewan, MAA & Siddique, N 2023, 'TEmoX: Classification of Textual Emotion using Ensemble of Transformers', IEEE Access, vol. 11, pp. 109803 - 109818. https://doi.org/10.1109/access.2023.3319455

Dhakan, P, Kasmarik, K, Vance, P, Rano, I & Siddique, N 2023, 'Concurrent Skill Composition using Ensemble of Primitive Skills', IEEE Transactions on Cognitive and Developmental Systems, vol. 15, no. 4, pp. 1879-1890. https://doi.org/10.1109/TCDS.2022.3177691

Dimmock, S, O'Donnell, C & Houghton, CJ 2023, 'Bayesian analysis of phase data in EEG and MEG', eLife, vol. 12. https://doi.org/10.7554/eLife.84602

Dwivedi, VK 2023, 'Privacy-Conflict Resolution for Integrating Personal and Electronic Health Records in Blockchain-Based Systems', Blockchain in Healthcare Today, vol. 6, no. 2, 176. https://doi.org/10.30953/bhty.v6.276

Dwivedi, VK 2024, 'Mobile Smart Contracts: Exploring Scalability Challenges and Consensus Mechanisms', IEEE Access, vol. 12, pp. 34265-34288. https://doi.org/10.1109/ACCESS.2024.3371901

Elangovan, P, Dhurairajan, V, Nath, MK, Yogarajah, P & Condell, J 2024, 'A Novel Approach for Meat Quality Assessment Using an Ensemble of Compact Convolutional Neural Networks', Applied Sciences, vol. 14, no. 14, 5979, pp. 1-18. https://doi.org/10.3390/app14145979

English, A, McDaid, D, Lynch, S, McLaughlin, J, Cooper, E, Wingfield, B, Kelly, M, Bhavsar, M, McGilligan, VE & Irwin, RE et al. 2023, 'Genomic, Proteomic and Phenotypic Biomarkers of COVID-19 Severity: Protocol for a Retrospective Observational Study', JMIR Research Protocol, vol. 13. https://doi.org/10.2196/50733

Eylem-van Bergeijk, O, Poulter, S, Ashcroft, K, Robinson, T, Mane, P, Islam, M, Condell, J & Leavey, G 2024, 'Cerina: cognitive–behavioural therapy-based mobile application for managing GAD symptoms among Ulster University Students in Northern Ireland – a protocol for a pilot feasibility randomised controlled trial', BMJ Open, vol. 14, no. 6, e083554, pp. 1-12. https://doi.org/10.1136/bmjopen-2023-083554

Farhadi, M, Gorji, A, Mirsalehi, M, Müller, M, Poletaev, AB, Mahboudi, F, Asadpour, A, Ebrahimi, M, Beiranvand, M & Khaftari, MD et al. 2023, 'The human neuroprotective placental protein composition suppressing tinnitus and restoring auditory brainstem response in a rodent model of sodium salicylate-induced ototoxicity', Heliyon, vol. 9, no. 8, e19052, pp. 1-18. https://doi.org/10.1016/j.heliyon.2023.e19052

Farhadi, M, Gorji, A, Mirsalehi, M, Poletaev, AB, Asadpour, A, Mahboudi, F, Jafarian, M, Farrahizadeh, M, Akbarnejad, Z & Mahmoudian, S 2023, 'Electrophysiological and molecular changes following neuroprotective placental protein administration on tinnitus-induced rats', Laryngoscope Investigative Otolaryngology, vol. 8, no. 5, pp. 1410-1420. https://doi.org/10.1002/lio2.1156

G., S, Mundada, MR, S., S & Gardiner, B 2023, 'Deep Learning-based Resource Prediction and Mutated Leader Algorithm Enabled Load Balancing in Fog Computing', International Journal of computer networks and information

security, vol. 15, no. 4, pp. 84-95. https://doi.org/10.5815/ijcnis.2023.04.08

Gallagher, C, Kerr, E & McFadden, S 2023, 'Particle size distribution for additive manufacturing powder using stereological corrections', Powder Technology, vol. 429, 118873, pp. 1-8. https://doi.org/10.1016/j.powtec.2023.118873

Gamage, L, Isuranga, U, Meedeniya, D, De Silva, S & Yogarajah, P 2024, 'Melanoma Skin Cancer Identification with Explainability Utilizing Mask Guided Technique', Electronics, vol. 13, no. 4, 680, pp. 1-30. https://doi.org/10.3390/electronics13040680

Ge, F, Zhang, Y, Liu, Y, Wang, G, Coleman, S, Kerr, D & Wang, L 2024, 'Multi-branch Joint Representation Learning Based on Information Fusion Strategy for Cross-view Geo-localization', IEEE Transactions on Geoscience and Remote Sensing, vol. 62, 5909516, pp. 1-16. https://doi.org/10.1109/TGRS.2024.3378453

Ge, F, Zhang, Y, Wang, L, Coleman, S & Kerr, D 2024, 'Double-domain Adaptation Semantics for Retrieval-based Long-term Visual Localization', IEEE Transactions on Multimedia, vol. 26, pp. 6050-6064. https://doi.org/10.1109/tmm.2023.3345138

Ge, F, Zhang, Y, Wang, L, Liu, W, Liu, Y, Coleman, S & Kerr, D 2024, 'Multi-level Feedback Joint Representation Learning Network Based on Adaptive Area Elimination for Cross-view Geo-localization', IEEE Transactions on Geoscience and Remote Sensing, vol. 62, 5913915, pp. 1-15. https://doi.org/10.1109/tgrs.2024.3396330

Ghorbani, M, Alizadeh, Z & Azimi, A 2023, 'Frequency-Dependent Network Mechanisms of Multi-Regional Temporal Interactions during Sleep Spindles', IBRO Neuroscience Reports, vol. 15, no. Supplement 1, P1495, pp. S736. https://doi.org/10.1016/j.ibneur.2023.08.1501

Greene, M, Smyth, P, English, A, McLaughlin, J, Bucholc, M, Bailie, J, McCarroll, J, McDonnell, M, Watt, A & Barnes, G et al. 2024, 'Analysis of SARS-CoV-2 antibody seroprevalence in Northern Ireland during 2020–2021', Heliyon, vol. 10, no. 2, e24184, pp. 1-11. https://doi.org/10.1016/j.heliyon.2024.e24184

Harkin, J & Trefzer, M 2024, 'Bridging Nature and Artificial Intelligence for Smart Electronics Technology', Scientia. https://doi.org/10.33548/SCIENTIA1042

Harrigan, S, Bi, Y, Huang, M, O'Neill, C, Zhai, W, Sun, J & Zhang, X 2024, 'Detection of Electromagnetic Seismic Precursors from Swarm Data by Enhanced Martingale Analytics', Sensors, vol. 24, no. 11, 3654, pp. 1-27. https://doi.org/10.3390/s24113654

Henderson, B, Yogarajah, P, Gardiner, B & McGinnity, TM 2023, 'Encoding Kinematic and Temporal Gait Data in an Appearance-Based Feature for the Automatic Classification of Autism Spectrum Disorder', IEEE Access, vol. 11, pp. 134100-134117. https://doi.org/10.1109/access.2023.3336861

Henderson, B, Yogarajah, P, Gardiner, B & McGinnity, TM 2023, 'From Model to Appearance Based Autism Spectrum Disorder Classification: The Joint Energy Image', IEEE Access.

Imran, M, Khan, S, Khalid, A, Rafferty, C, Shah, YA, Pagliarini, S, Rashid, M & O'Neill, M 2024, 'Evaluating NTT/INTT Implementation Styles for Post-Quantum Cryptography', IEEE Embedded Systems Letters, pp. 1-4. https://doi.org/10.1109/LES.2024.3410516

Iqbal, M, Kormiltsyn, A, Dwivedi, VK & Matulevičius, R 2024, 'Blockchain-based ontology driven reference framework for security risk management', Data and Knowledge Engineering, vol. 149, 102257, pp. 1-23. https://doi.org/10.1016/j.datak.2023.102257

Islam, AKMK, Dunlop, PSM, Bhattacharya, G, Mokim, M, Hewitt, N, Huang, Y, Gogulancea, V, Zhang, K & Brandoni, C 2023, 'Comparative performance of sustainable anode materials in microbial fuel cells (MFCs) for electricity generation from wastewater', Results in Engineering, vol. 20, no. 101385, 101385, pp. 1-12. https://doi.org/10.1016/j.rineng.2023.101385

Jha, RK, Kasabov, N, Bhattacharyya, S, Coyle, D & Prasad, G 2024 'From Quantum Computing to Quantum-inspired Computation for Neuromorphic Advancement -- A Survey'. https://doi.org/10.36227/techrxiv.24053250.v1

Javeed, K, Shah, YA & Gregg, D 2024, 'GMC-crypto: Low latency implementation of ECC point multiplication for generic Montgomery curves over GF(p)', Journal of Parallel and Distributed Computing, vol. 193, 104946. https://doi.org/10.1016/j.jpdc.2024.104946

Jennifer, SS, Shamim, MH, Reza, AW & Siddique, N 2023, 'Sickle cell disease classification using deep learning', Heliyon, vol. 9, no. 11, e22203, pp. 1-2. https://doi.org/10.1016/j.heliyon.2023.e22203

Kabir, MA, Rehman, AU, Islam, MMM, Ali, N, Baptista, ML & Simos, TE (ed.) 2023, 'Cross-Version Software Defect Prediction Considering Concept Drift and Chronological Splitting', Symmetry, vol. 15, no. 10, 1934, pp. 1-25. https://doi.org/10.3390/sym15101934

Kamboj, M, Kadian, K, Dwivedi, V, Wary, A & Ojha, S 2024, 'Advanced detection techniques for driver drowsiness: a comprehensive review of machine learning, deep learning, and physiological approaches', Multimedia Tools and Applications. https://doi.org/10.1007/s11042-024-19738-z

Kasabov, N, Tan, Y, Doborjeh, M, Tu, E, Yang, J, Goh, W & Lee, J 2023, 'Transfer Learning of Fuzzy Spatio-Temporal Rules in the NeuCube Brain-Inspired Spiking Neural Network: A Case Study on EEG Spatio-temporal Data: A Case Study on Spatio-Temporal Brain Data', IEEE Transactions of Fuzzy Systems, vol. 31, no. 12, TFS-2022-1366.R2, pp. 4542-4552. https://doi.org/10.1109/TFUZZ.2023.3292802

Kasabov, NK, Bahrami, H, Doborjeh, M & Wang, A 2023, 'Brain-Inspired Spatio-Temporal Associative Memories for Neuroimaging Data Classification: EEG and fMRI', Bioengineering, vol. 10, no. 12, 1341, pp. 1-17. https://doi.org/10.3390/bioengineering10121341

Kaur, D, Bucholc, M, Finn, D, Todd, S, Wong-Lin, K & McClean, P 2024, 'Impact of different diagnostic measures on drug class association with dementia progression risk: A longitudinal prospective cohort study', Journal of Alzheimer's Disease, vol. 100, no. 2, pp. 631-644. https://doi.org/10.3233/JAD-230456

Khan, R, Mehmood, A, Maple, C, Curran, K & Song, HH 2023, 'Performance Analysis of Blockchain-Enabled Security and Privacy Algorithms in Connected and Autonomous Vehicles: A Comprehensive Review', IEEE Transactions on Intelligent Transportation Systems, vol. 25, no. 6, pp. 4773-4784. https://doi.org/10.1109/tits.2023.3341358

Khodadadzadeh, M, Sloan, AT, Jones, NA, Coyle, D & Kelso, JAS 2024, 'Artificial intelligence detects awareness of functional relation with the environment in 3 month old babies', Scientific Reports, vol. 14, no. 1, 15580, pp. 1-19. https://doi.org/10.1038/s41598-024-66312-6

Korik, A, Du Bois, N, Campbell, G, O'Neill, E, Hay, L, Gilbert, S, Grealy, M & Coyle, D 2024, 'Real-time feedback improves imagined 3D primitive object classification from EEG', Brain-Computer Interfaces, vol. 11, no. 1-2, TBCI-2022-0007R3, pp. 61-85. https://doi.org/10.1080/2326263X.2024.2334558

Kumar, A, Kerr, E & McKnight, W 2024, 'Smart Manufacturing in Timber Production', Engineering Proceedings, vol. 65, no. 1, 5, pp. 1-4. https://doi.org/10.3390/engproc2024065005

Liu, Y, Zhang, Y, Wang, Z, Yang, F, Qiu, F, Coleman, S & Kerr, D 2023, 'A novel seminar learning framework for weakly supervised salient object detection', Engineering Applications of Artificial Intelligence, vol. 126, no. Part B, 106961, pp. 1-17. https://doi.org/10.1016/j.engappai.2023.106961

Maciąg, PS, Bembenik, R, Piekarzewicz, A, Del Ser, J, Lobo, JL & Kasabov, NK 2023, 'Effective air pollution prediction by combining time series decomposition with stacking and bagging ensembles of evolving spiking neural networks', Environmental Modelling and Software, vol. 170, 105851. https://doi.org/10.1016/j.envsoft.2023.105851

Malik, M, Chong, B, Fernandez, J, Shim, V, Kasabov, N & Wang, A 2024, 'Stroke Lesion Segmentation and Deep Learning: A Comprehensive Review', Bioengineering, vol. 11, no. 1, 86, pp. 1-19. https://doi.org/10.3390/bioengineering11010086

Martinez-Seras , A, Del Ser Lorente, J, Lopez Lobo, J, Garcia-Bringas , P & Kasabov, N 2023, 'A novel Out-of-Distribution detection approach for Spiking Neural Networks: Design, fusion, performance evaluation and explainability', Information Fusion, vol. 100, 101943, pp. 1-20. https://doi.org/10.1016/j.inffus.2023.101943

Mason, L, Connolly, J, Devenney, LE, Lacey, K, O'Donovan, J & Doherty, R 2023, 'Sleep, Nutrition, and Injury Risk in Adolescent Athletes: A Narrative Review', Nutrients, vol. 15, no. 24, 5101, pp. 1-16. https://doi.org/10.3390/nu15245101

Menting, SGP, Redican, E, Murphy, J & Bucholc, M 2023, 'Primary Care Antibiotic Prescribing and Infection-Related Hospitalisation', Antibiotics, vol. 12, no. 12, 1685, pp. 1-14. https://doi.org/10.3390/antibiotics12121685

Mohamed Mohideen, MA, Nadeem, MS, Hardy, J, Ali, H, Tariq, UU, Sabrina, F, Waqar, M & Ahmed, S 2024, 'Behind the Code: Identifying Zero-Day Exploits in WordPress', Future Internet, vol. 16, no. 7, 256, pp. 1-22. https://doi.org/10.3390/fi16070256

Newby, D, Orgeta, V, Marshall, CR, Lourida, I, Albertyn, CP, Tamburin, S, Raymont, V, Veldsman, M, Koychev, I & Bauermeister, S et al. 2023, 'Artificial intelligence for dementia prevention', Alzheimer's and Dementia, vol. 19, no. 12, pp. 5952-5969. https://doi.org/10.1002/alz.13463

O'Donnell, C 2023, 'Nonlinear slow-timescale mechanisms in synaptic plasticity', Current opinion in neurobiology, vol. 82, 102778, pp. 1-9. https://doi.org/10.1016/j.conb.2023.102778

Orojo, O, Tepper, J, McGinnity, TM & Mahmud, M 2023, 'The Multi-Recurrent Neural Network for State-Of-The-Art Time-Series Processing', Procedia Computer Science, vol. 222, pp. 488-498. https://doi.org/10.1016/j.procs.2023.08.187

Pandey, DS, Raza, H & Bhattacharyya, S 2023, 'Development of explainable AI-based predictive models for bubbling fluidised bed gasification process', Fuel, vol. 351, 128971. https://doi.org/10.1016/j.fuel.2023.128971

Patil, DB, Nigam, A, Mohapatra, S & Nikam, S 2023, 'A Deep Learning Approach to Classify and Detect Defects in the Components Manufactured by Laser Directed Energy Deposition Process', Machines, vol. 11, no. 9, 854, pp. 1-18. https://doi.org/10.3390/machines11090854

Phunruangsakao, C, Achanccaray, D, Bhattacharyya, S, Izumi, S-I & Hayashibe, M 2023, 'Effects of Visual-Electrotactile Stimulation Feedback on Brain Functional Connectivity during Motor Imagery Practice', Scientific Reports, vol. 13, no. 1, 17752 (2023), pp. 1-15. https://doi.org/10.1038/s41598-023-44621-6

Reid, S, Coleman, S, Kerr, D, Vance, P & O'Neill, S 2023, 'Keypoint Changes for Fast Human Activity Recognition', SN Computer Science, vol. 4, no. 5, 621, pp. 1-11. https://doi.org/10.1007/s42979-023-02063-x

Rodrigues, YE, Tigaret, CM, Marie, H, O'Donnell, C, Veltz, R, van Rossum, MCW (ed.) & Huguenard, JR 2023, 'A stochastic model of hippocampal synaptic plasticity with geometrical readout of enzyme dynamics', eLife, vol. 12, e80152, pp. 1-63. https://doi.org/10.7554/elife.80152

Saeed, K, McIlhagger, A, Dooher, T, Ullah, J, Manzoor, F, Velay, X & Archer, E 2024, 'Lap Shear Strength and Fatigue Analysis of Continuous Carbon-Fibre-Reinforced 3D-Printed Thermoplastic Composites by Varying the Load and Fibre Content', Polymers, vol. 16, no. 5, 579, pp. 1-16. https://doi.org/10.3390/polym16050579

Sanchez-Bornot, J, Sotero, RC, Kelso, JAS, Şimşek, Ö & Coyle, D 2023, 'Solving large-scale MEG/EEG source localisation and functional connectivity problems simultaneously using state-space models', NeuroImage, vol. 285, 120458, pp. 1-21. https://doi.org/10.1016/j.neuroimage.2023.120458

Saranirad, V, Dora, S, McGinnity, TM & Coyle, D 2024, 'CDNA-SNN: A New Spiking Neural Network for Pattern Classification using Neuronal Assemblies', IEEE Transactions on Neural Networks and Learning Systems, pp. 1-14. https://doi.org/10.1109/TNNLS.2024.3353571

Scott, C, Gilpin, V, McCreadie, K & Davis, J 2023, 'Exploiting Laser-Induced Graphene Composites as Substrates for Copper-Mediated Nitrate Reduction', Journal of Composites Science, vol. 7, no. 9, 397, pp. 1-13. https://doi.org/10.3390/jcs7090397

Shan, D, Zhang, Y, Liu, X, Zhao, J, Coleman, S & Kerr, D 2024, 'Bilateral guidance network for one-shot metal defect segmentation', Engineering Applications of Artificial Intelligence, vol. 131, 107802, pp. 1-11. https://doi.org/10.1016/j.engappai.2023.107802

Sloan, AT, Jones, NA & Kelso, JAS 2023, 'Meaning from movement and stillness: Signatures of coordination dynamics reveal infant agency', Proceedings of the National Academy of Sciences, vol. 120, no. 39, e2306732120, pp. 1-7. https://doi.org/10.1073/pnas.2306732120

Taherkhani, A, Cosma, G & McGinnity, TM 2023, 'A Deep Convolutional Neural Network for Time Series Classification with Intermediate Targets', SN Computer Science, vol. 4, no. 6, pp. 1-24. https://doi.org/10.1007/s42979-023-02159-4

The Deep Dementia Phenotyping (DEMON) Network, Bucholc, M, James, C, Khleifat, AA, Badhwar, A, Clarke, N, Dehsarvi, A, Madan, CR, Marzi, SJ & Shand, C et al. 2023, 'Artificial intelligence for dementia research methods optimization', Alzheimer's and Dementia, vol. 19, no. 12, pp. 5934-5951. https://doi.org/10.1002/alz.13441

The Deep Dementia Phenotyping (DEMON) Network, Marzi, SJ, Schilder, BM, Nott, A, Frigerio, CS, Willaime-Morawek, S, Bucholc, M, Hanger, DP, James, C & Lewis, PA et al. 2023, 'Artificial intelligence for neurodegenerative experimental models', Alzheimer's and Dementia, vol. 19, no. 12, pp. 5970-5987. https://doi.org/10.1002/alz.13479

Tian, R, Zhang, Y, Yang, L, Zhang, J, Coleman, S & Kerr, D 2024, 'DynaQuadric: Dynamic Quadric SLAM for Quadric Initialization, Mapping, and Tracking', IEEE Transactions on Intelligent Transportation Systems, pp. 1-13. https://doi.org/10.1109/tits.2024.3418949

Wade, J, McDaid, LJ, Liu, J, Poshtkohi, A, Dallas, M & Bithell, A 2024, 'Mathematical Modelling of PI3K/Akt Pathway in Microglia', Neural Computation, vol. 36, no. 4, pp. 645-676. https://doi.org/10.1162/neco_a_01643

Wang, Z, Zhang, Y, Liu, Y, Qin, C, Coleman, SA & Kerr, D 2024, 'LARNet:Towards Lightweight, Accurate and Real-time Salient Object Detection', IEEE Transactions on Multimedia, vol. 26, pp. 5207-5222. https://doi.org/10.1109/TMM.2023.3330082

Wedasingha, N, Samarasinghe, P, Senevirathna, L, Papandrea, M, Puiatti, A & Rankin, D 2023, 'Automated Anomalous Child Repetitive Head Movement Identification through Transformer Networks', Physical and Engineering Sciences in Medicine, vol. 46, no. 4, pp. 1427-1445. https://doi.org/10.1007/s13246-023-01309-5

Yang, H, Mao, J, Ye, Q, Bucholc, M, Liu, S, Gao, W, Pan, J, Xin, J & Ding, X 2024, 'Distance-based novelty detection model for identifying individuals at risk of developing Alzheimer's disease', Frontiers in Aging Neuroscience, vol. 16, 1285905, pp. 1-17. https://doi.org/10.3389/fnagi.2024.1285905

Yang, L, Zhang, Y, Tian, R, Liang, S, Shen, Y, Coleman, S & Kerr, D 2023, 'Fast, Robust, Accurate, Multi-Body Motion Aware SLAM', IEEE Transactions on Intelligent Transportation Systems, vol. 25, no. 5, pp. 4381-4397. https://doi.org/10.1109/tits.2023.3328359

Zhang, J, Zhang, Y, Liao, M, Tian, R, Coleman, S & Kerr, D 2024, 'CapsLoc3D: Point Cloud Retrieval for Large-Scale Place Recognition Based on 3D Capsule Networks', IEEE Transactions on Intelligent Transportation Systems, vol. 25, no. 7, pp. 6811-6823. https://doi.org/10.1109/TITS.2023.3346953

Zhang, X, Liu, Y, Wang, B, Zhou, S, Shi, P, Cao, B, Zheng, Y, Zhang, Q & Nikola, KK 2023, 'Biomolecule-Driven Two-Factor Authentication Strategy for Access Control of Molecular Devices', ACS Nano, vol. 17, no. 18, pp. 18178–18189. https://doi.org/10.1021/acsnano.3c05070

3.2. BOOKS/BOOK CHAPTERS

Kumar, P, Sawant, MS & Nikam, S 2023, Recent Developments in the Area of Laser Cladding and Surface Alloying. in Laser Applications in Manufacturing. 1 edn, CRC Press, pp. 59-80. https://doi.org/10.1201/9781003279501-4

Rahman, S, Gordon, T, Henderson, L, Gao, Y, Coleman, S & Kerr, D 2024, Model-Free Automated Reversing of Articulated Heavy Goods Vehicles. in G Mastinu, F Braghin, F Cheli, M Corno & SM Savaresi (eds), 16th International Symposium on Advanced Vehicle Control (AVEC 2024). Lecture Notes in Mechanical Engineering, Springer Cham, pp. 116-122. https://doi.org/10.1007/978-3-031-70392-8_17

Ramanathan, R (ed.), Duan, Y (ed.), Condell, J (ed.), Ramanathan, U (ed.), Ajmal, T (ed.) & Gillespie, J 2024, New Multidisciplinary Approaches for Reducing Food Waste in Agribusiness Supply Chains. MDPI. https://doi.org/10.3390/books978-3-7258-0029-2

Sanchez-Bornot, JM & Sotero, RC 2023, Machine Learning for Time Series Forecasting Using State Space Models. in International Conference on Intelligent Data Engineering and Automated Learning. vol. 14404, Springer Nature, pp. 470-482. https://doi.org/10.1007/978-3-031-48232-8_43

Sotero, RC & Sanchez-Bornot, JM 2023, Hebbian Learning-Guided Random Walks for Enhanced Community Detection in Correlation-Based Brain Networks. in P Quaresma, T Gonçalves, D Camacho, H Yin, V Julian & AJ Tallón-Ballesteros (eds), Lecture Notes in Computer Science: Intelligent Data Engineering and Automated Learning – IDEAL 2023. vol. 14404, Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics), vol. 14404 LNCS, Springer Nature, pp. 222–232. https://doi.org/10.1007/978-3-031-48232-8_21

3.3. CONFERENCE CONTRIBUTIONS

Abdullayev, K, Chico, T, Gorvett, O, Sochiera, A, Manktelow, M, Condell, J, Buckley, O, Van Arkel, R, Diaz, V & Matcham, F 2023, BS85 A clinician-led understanding of the implementation of digital technologies within heart disease diagnosis: a qualitative investigation. in Heart 2023. Suppl 3 edn, vol. 109, BMJ Publishing Group Ltd and British Cardiovascular Society, pp. A307-A308. https://doi.org/10.1136/heartjnl-2023-BCS.298

Agarwal, A & Sharma, S 2023, LLANIME: Large Language Models for Anime Recommendations. in 2023 16th International Conference on Developments in eSystems Engineering (DeSE). 2023 16th International Conference on Developments in eSystems Engineering (DeSE), IEEE, 2023 16th International Conference on Developments in eSystems Engineering (DeSE), Instanbul, Turkey, 18/12/23. https://doi.org/10.1109/dese60595.2023.10468757

Ahmed, S, Singh, M, Bhattacharyya, S & Coyle, D 2024, Decoding Neural Activity for Part-Of-Speech Tagging (POS). in 2023 IEEE International Conference on Systems, Man, and Cybernetics (SMC): Improving the Quality of Life, SMC 2023 - Proceedings. Conference Proceedings - IEEE International Conference on Systems, Man and Cybernetics, IEEE, Oahu, Hawaii, USA, pp. 3079-3084, The 2023 IEEE Conference on Systems, Man, and Cybernetics, Honolulu, Hawaii, United States, 1/10/23. https://doi.org/10.1109/SMC53992.2023.10394253

Ahsan, S, Tasnia, F, Tabassum, N, Das, A, Hoque, MM & Siddique, N 2024, Classifying Textual Sentiment Using Bidirectional Encoder Representations from Transformers. in 2023 26th International Conference on Computer and Information Technology (ICCIT). 2023 26th International Conference on Computer and Information Technology (ICCIT), IEEE, pp. 1-6. https://doi.org/10.1109/iccit60459.2023.10441046

Alausa, A, Sanchez Bornot, J, Asadpour, A, McClean, P & Wong-Lin, K 2024, Alzheimer's Disease Classification Confidence of Individuals using Deep Learning on Heterogeneous Data. in UK Workshop on Computational Intelligence. Springer, 23rd Annual UK Workshop on Computational Intelligence 2024, Belfast, Northern Ireland, 2/09/24.

Asadpour, A & Wong-Lin, K 2024, Can multivariate Granger causality detect directed connectivity of a multistable and dynamic biological decision network model? in UK Workshop on Computational Intelligence. Springer, 23rd Annual UK Workshop on Computational Intelligence 2024, Belfast, Northern Ireland, 2/09/24.

Azimi, A, Asadpour, A & Wong-Lin, K 2024, 'Can dynamic causal modelling (DCM) identify multistable neural circuits for decision-making?', FENS Forum 2024, Vienna, Austria, 25/06/24 - 29/06/24. https://doi.org/10.57736/505c-276b, https://doi.org/10.57736/505C-276B

Barman, T, Coleman, S, Kerr, D, Harrigan, S & Quinn, JP 2024, Advancements in Industrial Visual Inspection: Harnessing Hyperspectral Imaging for Automated Solder Quality Assessment. in IEEE International Conference on Industrial Informatics (INDIN). IEEE, 22nd IEEE International Conference on Industrial Informatics, Beijing, China, 17/08/24.

Bawa, P, Kadyan, V & Singh, M 2024, Comprehensive Phonological Analysis for Clinical Implication Using Self-Attention Based Grapheme to Phoneme Modeling Under Low-Resource Conditions. in 2023 31st Irish Conference on Artificial Intelligence and Cognitive Science (AICS). 2023 31st Irish Conference on Artificial Intelligence and Cognitive Science, AICS 2023, IEEE, 2023 31st Irish Conference on Artificial Intelligence and Cognitive Science (AICS), Letterkenny, Ireland, 7/12/23. https://doi.org/10.1109/aics60730.2023.10470608

Cecotti, H, van der Putten, L, Coste, R & Callaghan, M 2023, Assessment of Input Modalities for Control and Accessibility in Fully Immersive Virtual Reality Educational Game. in P Dondio, M Rocha & A Brennan (eds), Lecture Notes in Computer Science . vol. 14475, Springer, Dublin, pp. 289 - 298, International Conference Games and Learning Alliance Conference , Dublin, Ireland, 29/11/23.

Chavan, S, Kerr, D, Coleman, S & Khader, H 2023, A Foveated Approach to Automated Billboard Detection. in P Dini (ed.), DIGITAL 2023: Advances on Societal Digital Transformation. International Academy, Research, and Industry Association, pp. 20-28, Advances on Societal Digital Transformation DIGITAL 2023, Porto, Portugal, 25/09/23.

Chavan, S, Kerr, D, Coleman, S & Khader, H 2023, Deep Learning for Billboard Classification. in P Dini (ed.), DIGITAL 2023: Advances on Societal Digital Transformation. International Academy, Research, and Industry Association, pp. 29-35, Advances on Societal Digital Transformation DIGITAL 2023, Porto, Portugal, 25/09/23.

Colville, M, Kerr, E & Nikam, S 2024, A Review of the Image Classification Models Used for the Prediction of Bed Defects in the Selective Laser Sintering Process. in Proceedings of 39th International Manufacturing Conference. 1 edn, vol. 65, Engineering Proceedings, MDPI, pp. 1-4. https://doi.org/10.3390/engproc2024065003

Doherty, J, Gardiner, B, Kerr, E & Siddique, N 2024, 'Fast and Accurate Tactile Object Recognition using a Random Convolutional Kernel Transform', Paper presented at International Conference on Advanced Robotics (ICAR), United Arab Emirates, 5/12/23 - 8/12/23 pp. 599-604. https://doi.org/10.1109/ICAR58858.2023.10406365

Freud, K, Jones, M, Lepora, N & O'Donnell, C 2023, 'Deep learning-based decoding of spatial information from limbic-cortical local field potentials reveal drifting spatial representations with increasing stability', Conference on Cognitive Computational Neuroscience, Oxford, United Kingdom, 24/08/23 - 27/08/23 pp. 1-4. https://doi.org/10.32470/ccn.2023.1655-0

Gallagher, C, Kerr, E & McFadden, S 2024, Additive Manufacturing Powder Particle Size Distributions: Comparison of Histogram Binning Methods. in The 39th International Manufacturing Conference: Smart Manufacturing: The Next Generation. 1 edn, vol. 65, Engineering Proceedings, MDPI, pp. 33-34, The 39th International Manufacturing Conference, Derry/Londonderry, Northern Ireland, 24/08/23. https://doi.org/10.3390/engproc2024065014

Gambale, A, Kerr, E, Kerr, D & Coleman, S 2024, Computing the Orientation of Hardware Components from Images using Traditional Computer Vision Methods. in The 39th International Manufacturing Conference: Smart Manufacturing: The Next Generation . 1 edn, vol. 65, 8, Engineering Proceedings, MDPI, pp. 1-2, The 39th International Manufacturing Conference, Derry/Londonderry, Northern Ireland, 24/08/23. https://doi.org/10.3390/engproc2024065008

Gardiner, B, Zhang, H, Fayemiwo, M & Ding, X 2024, 'Enhancing Medical Image Segmentation using Hexagonal Convolutional Neural Networks', Paper presented at International Conference on Artificial Intelligence in Medicine, 9/07/24 - 12/07/24.

Gaurav, A, Gupta, BB, Chui, KT, Arya, V & Chaurasia, P 2024, Deep Learning Based Hate Speech Detection on Twitter. in 2023 IEEE 13th International Conference on Consumer Electronics - Berlin, ICCE-Berlin 2023. 2023 IEEE 13th International Conference on Consumer Electronics - Berlin (ICCE-Berlin), IEEE. https://doi.org/10.1109/icce-berlin58801.2023.10375620

Gillespie, J, Rañó, I, Santos, JA & Siddique, N 2024, 'Reinforcement Learning for Bio-Inspired Stochastic Robot Control', Paper presented at 31st Irish Conference on Artificial Intelligence and Cognitive Science (AICS), Letterkenny, Donegal, Ireland, 7/12/23 - 8/12/23 pp. 1-8. https://doi.org/10.1109/AICS60730.2023.10470579

Gnanavel, N, Inparaj, P, Sritharan, N, Meedeniya, D & Yogarajah, P 2024, Interpretable Cervical Cell Classification: A Comparative Analysis. in ICARC 2024 - 4th International Conference on Advanced Research in Computing: Smart and Innovative Trends in Next Generation Computing Technologies, IEEE Xplore, pp. 7-12, International Conference in Advanced Research in Computing 2024, Belihuloya, Sri Lanka, 21/02/24. https://doi.org/10.1109/ICARC61713.2024.10499737

Gorman, M, Ding, X, Maguire, L & Coyle, D 2024, Convolutional AutoEncoders for Anomaly Detection in Semiconductor Manufacturing. in 31st Irish Conference on Artificial Intelligence and Cognitive Science. 31st edn, 2023 31st Irish Conference on Artificial Intelligence and Cognitive Science, AICS 2023, IEEE, pp. 1-6, 31st Irish Conference on Artificial Intelligence and Cognitive Science, Donegal, Ireland, 7/12/23. https://doi.org/10.1109/AICS60730.2023.10470831

Hamilton, N, Harkin, J, McDaid, L, Liu, J & Furey, E 2023, Feature Extraction Methods for Neural Networks in the Classification of Structural Health Anomalies. in Proceedings of the 15th International Joint Conference on Computational Intelligence. NCTA edn, vol. 1, pp. 514-523, 15th International Conference on Neural Computation Theory and Applications, Rome, Italy, 13/11/23. https://doi.org/10.5220/0012184800003595

Harrigan, S, Coleman, S & Kerr, D 2024, 'A phased-based approach to neuromorphic audio recognition', Paper presented at 22nd IEEE International Conference on Industrial Informatics, Beijing, China, 17/08/24 - 20/08/24.

Harrigan, S, Coleman, S, Kerr, D & Quinn, JP 2023, Modernised Reduction: Adapting the ROT tree. in International Conference on Intelligent Autonomous Systems. Springer, 18th International Conference on Intelligent Autonomous Systems, Suwon, Korea, Democratic People's Republic of, 4/07/23.

Harrigan, S, Coleman, S, Kerr, D, Quinn, JP, Madden, K, Lindsay, L, Henderson, B & Rahman, S 2024, Neuromorphic Event Alarm Time-Series Suppression. in 2023 IEEE Symposium Series on Computational Intelligence, SSCI 2023. 2023 IEEE Symposium Series on Computational Intelligence, SSCI 2023, IEEE, pp. 288-293, 2023 IEEE Symposium Series on Computational Intelligence, Mexico City, Mexico, 5/12/23. https://doi.org/10.1109/SSCI52147.2023.10372042

Harrigan, S, Coleman, S, Kerr, D, Quinn, JP, Madden, K, Liu, S & Lindsay, L 2024, 'Quantifying Temporal Entropy in Neuromorphic Memory Forgetting: Exploring Advanced Forgetting Models for Robust Long-term Information Storage', Paper presented at 2023 IEEE Symposium Series on Computational Intelligence, Mexico City, Mexico, 5/12/23 - 8/12/23 pp. 294-299. https://doi.org/10.1109/SSCI52147.2023.10372015

Hassard, P & Kerr, D 2024, Predicting Football Match Outcomes Using Event Data and Machine Learning Algorithms. in H Zheng, I Cleland, A Moore, H Wang, D Glass, J Rafferty, R Bond & J Wallace (eds), Proceedings of the 35th Irish Systems and Signals Conference, ISSC 2024. Proceedings of the 35th Irish Systems and Signals Conference, ISSC 2024, Institute of Electrical and Electronics Engineers Inc., 35th Irish Systems and Signals Conference, ISSC 2024, Belfast, United Kingdom, 13/06/24. https://doi.org/10.1109/ISSC61953.2024.10603147

Henderson, B, Yogarajah, P, Gardiner, B & McGinnity, TM 2024, '3D Human Pose Estimation Model Analysis: Gait Analytics for Autism Spectrum Disorder Detection', Paper presented at Irish Conference on Artificial Intelligence and Cognitive Science (AICS 2023), Ireland, 7/12/23 - 8/12/23 pp. 1-4. https://doi.org/10.1109/aics60730.2023.10470580

Hossain, J, Das, A, Hoque, MM & Siddique, N 2024, Multilabel Aggressive Text Classification from Social Media using Transformer-based Approaches. in 2023 26th International Conference on Computer and Information Technology (ICCIT). 2023 26th International Conference on Computer and Information Technology (ICCIT), IEEE, pp. 1-6. https://doi.org/10.1109/iccit60459.2023.10441608

Islam, MMM, McAteer, C & Prasad, G 2023, Efficient Wafer Defect Patterns Recognition Using Deep Convolutional Neural Network. in 2023 IEEE Conference on Artificial Intelligence (CAI). Proceedings - 2023 IEEE Conference on Artificial Intelligence, CAI 2023, IEEE, pp. 220-221, 2023 IEEE Conference on Artificial Intelligence, California, United States, 5/06/23. https://doi.org/10.1109/cai54212.2023.00102

Jha, RK, Kasabov, N, Bhattacharyya, S, Coyle, D & Prasad, G 2024, 'Quantum-Enhanced Feature Maps for Improved Quantum Kernels and Advanced Quantum Machine Learning Application', Quantum Computing and Artificial Intelligence Applications Workshop, Copenhagen, Denmark, 6/05/24 - 8/05/24.

Kadyan, V, Bawa, P, Akhtar, MM & Singh, M 2024, Speech-Based Alzheimer's Disease Classification System with Noise-Resilient Features Optimization. in 2023 31st Irish Conference on Artificial Intelligence and Cognitive Science (AICS). 2023 31st Irish Conference on Artificial Intelligence and Cognitive Science, AICS 2023, IEEE, 2023 31st Irish Conference on Artificial Intelligence and Cognitive Science (AICS), Letterkenny, Ireland, 7/12/23. https://doi.org/10.1109/aics60730.2023.10470516

Matharaarachchi, N, Pasha, MF, Coleman, S & Kerr, D 2024, Time Efficient Micro-Expression Recognition using Weighted Spatio-Temporal Landmark Graphs. in M Arif Wani, M Boicu, M Sayed-Mouchaweh, PH Abreu & J Gama (eds), 2023 International Conference on Machine Learning and Applications (ICMLA). Proceedings - 22nd IEEE International Conference on Machine Learning and Applications, ICMLA 2023, IEEE, pp. 1-8, 22nd International Conference on Machine Learning and Applications, Florida, United States, 15/12/23. https://doi.org/10.1109/ICMLA58977.2023.00055

McAllister, J, Wade, J & O'Donnell, C 2024, 'Heterosynaptic plasticity rules induce small-world network topologies', International Conference of Mathematical Neuroscience , Dublin, 11/06/24 - 14/06/24. https://doi.org/10.5281/zenodo.13303384

McAllister, J, Wade, J, Houghton, CJ & O'Donnell, C 2024, 'Random and biological network connectivity for reservoir computing: Random Reservoirs Rule! (at Remembering)', UK Neural Computation, Sheffield, 9/07/24 - 10/07/24. https://doi.org/10.5281/zenodo.13303677

McAllister, J, Wade, J, Houghton, CJ & O'Donnell, C 2024, Topological and simplicial features in reservoir computing networks. in UK Workshop on Computational Intelligence. 23rd Annual UK Workshop on Computational Intelligence 2024, Belfast, 2/09/24.

McCready, K, Coleman, S, Kerr, D & Kerr, E 2024, ASL Fingerspelling Classification for use in Robot Control. in Proceedings of The 39th International Manufacturing Conference. 1 edn, vol. 65, 12, Engineering Proceedings, MDPI, pp. 31-32, The 39th International Manufacturing Conference, Derry/Londonderry, Northern Ireland, 24/08/23. https://doi.org/10.3390/engproc2024065012

McFadden, S, McGowan, P & Kerr, E 2024, Preface: The 39th International Manufacturing Conference (IMC39) of the Irish Manufacturing Council. in Proceedings of the 39the International Manufacturing Conference. 1 edn, vol. 65, Engineering Proceedings, MDPI, pp. 1-4. https://doi.org/10.3390/engproc2024065016

McShane, N, McCreadie, K, Charles, D, Korik, A & Coyle, D 2024, Decoding Motion Trajectories in an Upper Limb BCI: Linear Regression vs Deep Learning. in 2023 IEEE International Conference on Metrology for eXtended Reality, Artificial Intelligence and Neural Engineering (MetroXRAINE). 2023 IEEE International Conference on Metrology for eXtended Reality, Artificial Intelligence and Neural Engineering, MetroXRAINE 2023 - Proceedings, IEEE, pp. 1039-1044. https://doi.org/10.1109/metroxraine58569.2023.10405752

Melaugh, M, Coleman, S & Kerr, D 2024, A Computational Approach to Uncertainty in DNA Sequences. in 2023 IEEE Symposium Series on Computational Intelligence, SSCI 2023. IEEE, pp. 1043-1048, 2023 IEEE Symposium Series on Computational Intelligence, Mexico City, Mexico, 5/12/23. https://doi.org/10.1109/SSCI52147.2023.10371838

Murray, C, Chaurasia, P, Hollywood, LE & Coyle, D 2023, A comparative analysis of state-of-the-art-time series forecasting algorithms. in Proceedings - 2022 International Conference on Computational Science and Computational Intelligence, CSCI 2022. 2022 edn, Proceedings - 2022 International Conference on Computational Science and Computational Intelligence, CSCI 2022, IEEE, pp. 89-95. https://doi.org/10.1109/CSCI58124.2022.00021

O'Boyle, A, Quinn, J, Archer, E & Mc Garrigle, C 2023, 'Examining the Effects of Tufting Patterns on Carbon Laminates', 26th Sir Bernard Crossland Symposium, Limerick , Ireland, 14/09/23 - 15/09/23.

Qiu, S, Bhattacharyya, S, Coyle, D & Dora, S 2024, 'Developing Variational Generative Models using Predictive Coding', Paper presented at 23rd Annual UK Workshop on Computational Intelligence 2024, Belfast, Northern Ireland, 2/09/24 - 4/09/24.

Rasheed, MR, Coleman, S, Gardiner, B, Vance, P, McAteer, C & Nguyen, K 2024, An EfficientNet-Based Transfer Learning System for Defect Classification in Manufacturing. in 22nd IEEE International Conference on Industrial Informatics. IEEE, 22nd International Conference on Industrial Informatics, Beijing, China, 17/08/24.

Saha, SK, Islam, MMM, McFadden, S, Bhattacharyya, S, Gorman, M & Prasad, G 2024, 'A Two-Step Framework for Predictive Maintenance of Cryogenic Pumps in Semiconductor Manufacturing', Paper presented at 16th Annual Conference of the Prognostics and Health Management Society, Nashville, United States, 9/11/24 - 14/11/24.

Shen, Y, Zhang, Y, Wu, Y, Wang, Z, Yang, L, Coleman, S & Kerr, D 2023, BSH-Det3D: Improving 3D Object Detection with BEV Shape Heatmap. in International Conference on Intelligent Robotics and Systems 2023: IROS 2023. IEEE, pp. 1-9, International Conference on Intelligent Robots and Systems 2023, Detroit, United States, 1/10/23. https://doi.org/10.1109/IROS55552.2023.10341930

Samanta, K, Roy, S, Marchand-Pauvert, V, Dora, S, Duguez, S, Singh, M, Prasad, G & Bhattacharyya, S 2023, An Automated Detection of Amyotrophic Lateral Sclerosis from Resting-State MEG Data Using 3D Deep Convolutional Neural Network. in 2023 IEEE International Conference on Systems, Man, and Cybernetics: Improving the Quality of Life, SMC 2023 - Proceedings. Conference Proceedings - IEEE International Conference on Systems, Man and Cybernetics, Institute of Electrical and Electronics Engineers Inc., pp. 3337-3342, 2023 IEEE International Conference on Systems, Man, and Cybernetics, SMC 2023, Hybrid, Honolulu, United States, 1/10/23. https://doi.org/10.1109/SMC53992.2023.10393987

Sanchez Bornot, J, Sotero, RC & Coyle, D 2023, Dynamic Source Localization and Functional Connectivity Estimation with State-Space Models: Preliminary Feasibility Analysis. in Proceeding of ICASSP 2023. ICASSPW 2023 - 2023 IEEE International Conference on Acoustics, Speech and Signal Processing Workshops, Proceedings, IEEE, pp. 1-5, 2023 IEEE International Conference on Acoustic, Speech and Signal Processing, Rhodes Island, Greece, 4/06/23. https://doi.org/10.1109/icasspw59220.2023.10193527

Sotero, RC & Sanchez-Bornot, JM 2024, Exploring Correlation-Based Brain Networks with Adaptive Signed Random Walks. in X Zhao, Q Li & L Wang (eds), Proceedings - 2023 16th International Congress on Image and Signal Processing, BioMedical Engineering and Informatics, CISP-BMEI 2023. Proceedings - 2023 16th International Congress on Image and Signal Processing, BioMedical Engineering and Informatics, CISP-BMEI 2023, IEEE Xplore, pp. 1-6. https://doi.org/10.1109/CISP-BMEI60920.2023.10373380

Sotero, RC, Sanchez-Bornot, JM & Iturria-Medina, Y 2024, Improving fMRI-based Autism Spectrum Disorder Classification with Random Walks-informed Feature Extraction and Selection. in ICBRA 2023 - Proceedings of the 2023 10th International Conference on Bioinformatics Research and Applications. ACM International Conference Proceeding Series, Association for Computing Machinery, pp. 41-47, 10th International Conference on Bioinformatics Research and Applications, Barcelona, Spain, 22/09/23. https://doi.org/10.1145/3632047.3632054

Sotero, RC, Sanchez-Bornot, JM, Shaharabi-Farahani, I & Iturria-Medina, Y 2023, Examining the Impact of fMRI Preprocessing Steps on Machine Learning-Based Classification of Autism Spectrum Disorder. in ICMHI 2023 - 2023 the 7th International Conference on Medical and Health Informatics. ACM International Conference Proceeding Series, Association for Computing Machinery, pp. 19-24, 7th International Conference on Medical and Health Informatics, Kyoto, Japan, 12/05/23. https://doi.org/10.1145/3608298.3608302

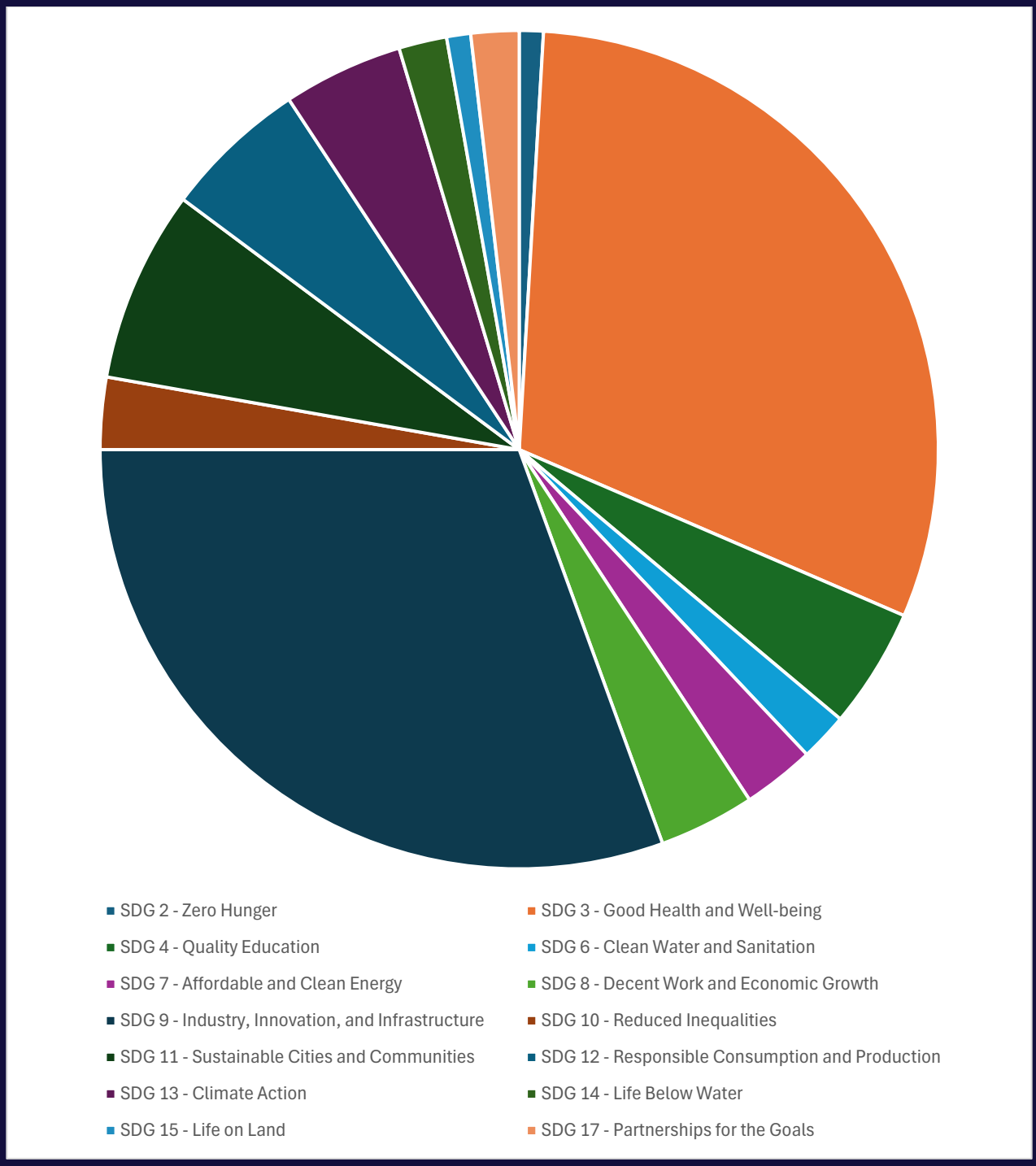
Sritharan, N, Gnanavel, N, Inparaj, P, Meedeniya, D & Yogarajah, P 2024, EnsembleCAM: Unified Visualization for Explainable Cervical Cancer Identification. in CA Kavirathna (ed.), Proceedings - International Research Conference on Smart Computing and Systems Engineering, SCSE 2024. Proceedings - International Research Conference on Smart Computing and Systems Engineering, SCSE 2024, IEEE Xplore, pp. 1-6. https://doi.org/10.1109/SCSE61872.2024.10550859

Venezia, S, Coleman, S, Kerr, D & Fegan, J 2023, Feature Based Approaches for Homography Estimation. in Irish Machine Vision and Image Processing Conference 2023 (IMVIP2023). pp. 1-8, Irish Machine Vision and Image Processing Conference 2023, Galway, Ireland, 30/08/23. https://doi.org/10.5281/ZENODO.8202527

Wang, J, Black, M, Rankin, D, Wallace, J, Hughes, C, Hoey, L, Moore, A, Tobin, J, Zhang, M & Ng, J et al. 2024, Analysis of Risk Factors and Diagnosis for Anxiety Disorder in Older People with the Aid of Artificial Intelligence: Observational Study. in 31st Irish Conference on Artificial Intelligence and Cognitive Science. 2023 31st Irish Conference on Artificial Intelligence and Cognitive Science, AICS 2023, IEEE, Irish Conference on Artificial Intelligence and Cognitive Science (AICS 2023), Ireland, 7/12/23. https://doi.org/10.1109/AICS60730.2023.10470782

SUSTAINABLE DEVELOPMENT GOALS

Universities and knowledge institutions have a critical role to play in the achievement of the United Nations Sustainable Development Goals (SDGs). Here is a breakdown of the Research Outputs for the School of Computing, Engineering, and Intelligence Systems, according to their SDGs.



4. RESEARCH FUNDING

Portfolio of Research Grants awarded during period 1 August 2023 - 31 July 2024

UoA MEMBER(S)	PROJECT TITLE	FUNDER	VALUE	AWARD DATE
Prof. Michaela Black Dr Bryan Gardiner Prof. Jim Harkin Prof. Liam McDaid Dr Deborah Rankin	Artificial Intelligence Collaboration Centre	Invest Northern Ireland	£13,830,161.00	24.08.2023
Prof. Joan Condell	Development Of AI Tool For Precision Therapeutic & Prognosis On Early Dementia And Post-Stroke Rehabilitation	Innovate UK	£75,007.00	30.08.2023
Prof. Justin Magee Dr Cormac McGarrigle Dr Justin Quinn	AHRC Green Transition Ecosystem: Future Island-Island	Arts & Humanities Research Council	£4,112,377.00	12.09.2023
Prof. Jim Harkin	Land Use for Net Zero Hub	Biotechnology & Biological Sciences Research Council	£87,879.00	01.11.2023
Prof. Declan Keeney Prof. Michaela Black Prof. Joan Condell Dr Justin Quinn	CoStar Network Lab	Arts & Humanities Research Council	£2,499,450.00	06.11.2023
Dr Saugat Bhattacharyya Prof. Girijesh Prasad	Patient and Public Involvement in Developing Accessible Stroke Rehabilitation Technology	NI Department for the Economy	£15,505.00	08.01.2024
Dr Dermot Kerr Prof. Sonya Coleman	Hyperdimensional neuromorphic representations for Green AI	NI Department for the Economy	£22,880.00	08.01.2024

Dr Deepika Nikam Prof. Sonya Coleman Dr Dermot Kerr Dr Sagar Nikam	Computer Vision for Arc Additive Process Monitoring	NI Department for the Economy	£14,505.00	08.01.2024
Dr Pratheepan Yogarajah Dr Priyanka Chaurasia Prof. Joan Condell	An Explainable AI-based Automated Pre-Screening Tool for Specific Learning Disabilities in Children using their handwritten images	NI Department for the Economy	£18,801.20	08.01.2024
Prof. Sonya Coleman Dr Dermot Kerr	Transformative Technologies for Autism Diagnosis in Children	NI Department for the Economy	£16,105.00	09.01.2024
Dr Juliana Gerard Dr Muskaan Singh	Adaptive Education: Harnessing AI for Academic Progress	NI Department for the Economy	£40,020.41	10.01.2024
Dr Dermot Kerr Prof. Sonya Coleman Dr Justin Quinn	Local Industrial Decarbonisation Plan for NI	Innovate UK	£97,755.00	15.01.2024
Prof. Sonya Coleman Dr Dermot Kerr	NeuroEye_POC	Invest Northern Ireland	£135,218.00	18.01.2024
Prof. Phil Jordan Prof. Jim Harkin	Co-Centre for Climate + Biodiversity and Water	NI Department of Agriculture, Environment & Rural Affairs	£1,493,864.99	26.01.2024
Prof. Girijesh Prasad Ryan Beveridge Dr Pratheepan Yogarajah	A UK-LMIC Research Network for Autism Spectrum Disorder (ULMiRN-ASD)	NI Department for the Economy	£26,130.00	07.02.2024
Dr Priyanka Chaurasia Prof. Joan Condell Dr Pratheepan Yogarajah	Screen4Lead in Mothers: Automated lead toxicity prediction in pregnant women using predictive modelling	NI Department for the Economy	£13,326.68	09.02.2024
Dr Pratheepan Yogarajah	Screen4SpLDs – Development of an Automated Pre-Screening Tool for Specific Learning Disabilities in Children	Engineering & Physical Sciences Research Council	£170,756.00	19.02.2024

Professor Kevin Curran Dr Bryan Gardiner Dr Muskaan Singh	T3-NCP (Turning Tides and Tackling Trials - Navigating Crime Prevention for safer communities	The British Academy	£9,725.00	26.03.2024
Sharon Neill Dr Cormac McGarrigle	Development of a new innovative PUPI (Pressure Ulcer Prevention Innovation) Boot Pressure Relieving Device	Belfast Health and Social Care Trust	£37,458.00	30.05.2024
Dr Vimal Kumar Dwivedi Dr Bryan Gardiner Prof. Girijesh Prasad	Transforming E-Healthcare Data Management in in LMICs Using Blockchain Technology	NI Department for the Economy	£39,859.94	29.07.2024
Dr Pratheepan Yogarajah Dr Priyanka Chaurasia Prof. Joan Condell	Early Screening of Neurodevelopmental Disorders (Autism Spectrum Disorder and Specific Learning Difficulties) in Children in Egypt and South Africa	NI Department for the Economy	£39,997.32	29.07.2024
Dr Saugat Bhattacharyya Prof. Girijesh Prasad Prof. Kongfatt Wong-Lin	A Brain-Computer Interface driven Mental Fatigue Monitoring System to improve Stroke Rehabilitation Therapy	NI Department for the Economy	£37,689.32	29.07.2024
Dr Mohamed Elnaem Dr Muskaan Singh	Digital Health and Personalised Medicine: A Global Collaboration Initiative for Capacity Building across Malaysia, Indonesia, and Pakistan	NI Department for the Economy	£38,400.00	29.07.2024

5. NOTE FROM THE ASSOCIATE DEAN

The 2023-24 Annual Research Report for the School of Computing, Engineering, and Intelligent Systems reflects Ulster University's ongoing commitment to delivering impactful research excellence in areas that actively contribute to the economy of Northern Ireland and to society more generally.

The scope and scale of the research undertaken by the School is reflected in the high quality of the various outputs reported here and the direct positive impact that it is having on society through our various partnerships with industry and other national and international institutions.

The University Strategy: 'People, Place and Partnership' seeks to deliver 'Sustainable Futures for All' with research and innovation central to its success (People, Place and Partnership - People, Place and Partnership). The associated University Research Strategy (2023-2028) focuses on how our core values of Collaboration, Enhancing Potential, Inclusion, and Integrity underpin a sector-leading enviroment for the continued development of talent and opportunity across our designated research themes (Ulster University Research Strategy 2023-2028).

"[W]e are focused on further increasing our world-leading and internationally excellent research that impacts both locally and globally[.]"

As we to plan our submissions to relevant subject areas in the 2029 UK Research Excellence Framework exercise (REF2029), we are focused on further increasing our world-leading and internationally excellent research that impacts both locally and globally with Open Research as a central tenet of our ambitions.

Professor Brian J. Meenan
Associate Dean for Research and Innovation

REF 2021

Research Centres and Groups

Computational Neuroscience and Neuromorphic Engineering (CNET)

Team members: Dr Cain O Donnell (Lead), Dr Yasir Ali Shah, Dr Bronac Flanagan, Dr George Martin, Dr Aqib Javed, Mr Malachy McElholm, Prof. Jim Harkin and Prof. Liam McDaid

Cognitive Neuroscience and Neurotechnology (CNN)

Team members: Prof. Kongfatt Wong-Lin (Lead), Prof. Girijesh Prasad and Dr Saugat Bhattacharyya.

Cognitive Robotics (CR)

Team members: Dr Dermot Kerr (Lead), Prof. Sonya Coleman, Dr Philip Vance, Dr Nazmul Siddique, Dr Justin Quinn, Dr Deepika Nikam.

Intelligent Data Analytics (IDA)

Team members: Dr Bryan Gardner (Lead), Dr Karl McCreadie, Dr Muskaan Singh, Dr James Connolly, Dr Xuemei Ding, Dr Barry Dillon, Dr William Smyth, Dr Vimal Dwivedi, Prof. Damien Coyle

Human Centred Computing (HCC)

Team members: Dr Debbie Rankin (Interim Lead), Prof. Joan Condell, Prof. Michaela Black, Dr Priyanka Chaurasia, Dr Pratheepan Yogarajah, Mr Michael Callaghan, Prof. Kevin Curran, Mrs Rosaleen Hegarty

Computational Materials Engineering (CME)

Team members: Dr Shaun McFadden (Lead), Dr Cormac McGarrigle, Dr Khalid, Saeed, Dr Nikam Sagar, Dr Ryan Harkin