

## Keynote Talks

### Keynote Speech-I: Autonomous Machine Learning for Decision Support in Complex Environments



#### Bio of Prof. Jie Lu

Distinguished Professor Jie Lu is a world-renowned scientist in the field of computational intelligence, primarily known for her work in fuzzy transfer learning, concept drift, recommender systems, and decision support systems. She is an IEEE Fellow, IFSA Fellow, and Australian Laureate Fellow. Currently, Prof Lu is the Director of the Australian Artificial Intelligence Institute (AAIL) at University of Technology Sydney (UTS), Australia. She has published over 500 papers in leading journals and conferences; won 10 Australian Research Council (ARC) Discovery Projects as first chief investigator, and over 20 industry projects; and supervised 50 doctoral students to completion. Prof Lu serves as Editor-In-Chief for Knowledge-Based Systems and International Journal of Computational Intelligence Systems. She is a recognized keynote speaker, delivering over 40 keynote speeches at international conferences. She is the recipient of two IEEE Transactions on Fuzzy Systems Outstanding Paper Awards (2019 and 2022), NeurIPS2022 Outstanding Paper Award, Australia's Most Innovative Engineer Award (2019), Australasian Artificial Intelligence Distinguished Research Contribution Award (2022), and the Officer of the Order of Australia (AO) in the Australia Day 2023.

#### Talk Abstract

The talk will present how machine learning can innovatively and effectively learn from data to support data-driven decision-making in uncertain and dynamic situations, and automating the machine learning process, including source domain selection and related data stream selection. A set of new autonomous transfer learning theories, methodologies and algorithms will be presented that can transfer knowledge learnt in more source domains to a target domain by building latent space, mapping functions and self-training to overcome tremendous uncertainties in data, learning processes and decision outputs. Another set of autonomous concept drift theories, methodologies and algorithms will be discussed about how to handle ever-changing dynamic data stream environments with unpredictable pattern drifts in multiple streams by effectively and accurately detecting concept drift in an explanatory way, indicating when, where and how concept drift occurs and reacting accordingly. These new developments enable advanced machine learning and therefore enhance data-driven prediction and decision support systems in complex and dynamic real-world environments.

## Keynote Speech-II: STRONGHOLD: A System for Training Massive-Scale Models with Billions of Parameters



### Bio of Prof. Jie Xu

Jie Xu is Chair of Computing at the University of Leeds, Director of the UK White Rose Grid e- Science Centre, involving the three White Rose Universities of Leeds, Sheffield and York, a co-Leader of the EPSRC-funded UK National Hub in Clouds and Distributed Computing, and Head of the Distributed Systems and Services (DSS) Theme at Leeds. Xu has worked in the field of Distributed Computing Systems for over thirty-five years, engaging closely with industrial leaders in the field. He received a PhD in Computing Science from the University of Newcastle upon Tyne, and was Professor of Distributed Systems at the University of Durham before joined Leeds in 2003.

Professor Xu is an executive member of UKCRC (UK Computing Research Committee) and a Turing Fellow in AI and Data Science. He has served as an academic expert for numerous governments and industries, such as Singapore IDA, Lenovo, UK EPSRC, and UK DTI (InnovateUK). In addition, he has extensive editorial experience, having served as an editor for IEEE Distributed Systems from 2000 to 2005, and currently acting as an associate editor of IEEE Transactions on Parallel and Distributed Systems and ACM Computing Surveys. Professor Xu is a Steering Committee member for several prestigious IEEE conferences, such as SRDS, ISORC, HASE, SOSE, JCC, and CISOSE, as well as serving on the steering board of IEEE TC on BIS. He has also been a General Chair/PC Chair for various IEEE international conferences. With over 300 academic publications, including papers in top-ranked IEEE and ACM Transactions, Professor Xu has received international research prizes, such as the BCS/AT&T Brendan Murphy Prize, and led or co-led more than 20 research projects worth over £30M. He is also the co-founder of two university spin-outs that specialize in data

### Talk Abstract

In this presentation, we will share our recent experience with designing and implementing a practical system, STRONGHOLD, for training massive-scale language models with billions of parameters, with a focus on our offloading mechanism for efficiently moving data amongst GPU memory and CPU RAM/secondary storages.

Deep Learning is advancing rapidly, and with it, the size of foundation models is increasing exponentially. However, training these models requires significant GPU resources and power, which can be unaffordable for many academic and industry research teams. Even for AI teams in large companies, resources are limited, and purchasing and maintaining these devices can be prohibitively expensive. For instance, training a GPT-3 model requires over thousands of high-performance-configured A100 GPUs for continuous 3 months. Our system, STRONGHOLD, addresses this challenge by offloading model weights to CPU RAM or other secondary storages dynamically and loading them back when needed, minimizing GPU memory requirements. STRONGHOLD also allows data movement and on-GPU computation to overlap to hide the extra overhead introduced by the offloading mechanism. Compared to state-of-the-art offloading-based solutions, STRONGHOLD improves the trainable model size by 1.9x to 6.5x on a 32GB V100 GPU, with 1.2x to 3.7x improvement on the training throughput. We have successfully deployed STRONGHOLD in production to support large-scale DNN training.

# Program

Day 1 (Sat 4 Nov 2023)	Day 2 (Sun 5 Nov 2023)	Day 3 (Mon 6 Nov 2023)
08:30 - 17:00	<b>Registration &amp; Refreshment</b> Venue: Gallery 1, John Niland Scientia Building	
09:00 - 09:15	<b>Opening Ceremony</b> Venue: Gallery 2, John Niland Scientia Building Teams Link	
09:15 - 10:15	<b>Keynote I - Autonomous Machine Learning for Decision Support in Complex Environments</b> Venue: Gallery 2, John Niland Scientia Building Teams Link  <i>Professor Jie Lu, University of Technology, Sydney, Australia</i>  Chair: TBD	
10:15 - 10:30	<b>Coffee Break + Networking</b> Venue: Gallery 1, John Niland Scientia Building	
10:30 - 12:00	<b>Session EBE-02: Big Data Analytics for e-Business - I</b> Venue: Gallery 2, John Niland Scientia Building Teams Link  Chair: TBD <ul style="list-style-type: none"><li>4 - Saptashwa Maity, Soujatya Khan and Sobhan Sarkar - A Two-phase Approach to Determine User-Preference and Feature Importance in Pricing of Cryptocurrencies using Twitter Data</li><li>15 - Hironori Takeuchi, Jati H. Husen, Hnin Thandar Tun, Hironori Washizaki and Nobukazu Yoshioka - Enterprise Architecture-based Metamodel for a Holistic Business—IT Alignment View on Machine Learning Projects</li><li>30 - Wael Jefry, Firas Al-Doghman and Farookh Hussain - Comparison of Artificial Intelligence Models in Cross-lingual Transfer Learning through Sentiment Analysis</li><li>17 - Mwaheb S. Almadani and Farookh Khadeer Hussain - Implementing a Secure Blockchain-Based Wallet System with Multi-Factor Authentication</li></ul>	

### Session EBE-03: B-business for Financial Security

Venue: The Gonski Seminar Room, John Niland Scientia Building

[Teams Link](#)

Chair: TBD

- 50 - Bingqing Shen, Yuxin Zeng, Linjing Cai, Aifan Ling, Jingzhi Guo and Lihong Jiang - Online Investment Protection through Efficient Loan Exchange
- 41 - Berkan Oztas, Deniz Cetinkaya, Festus Adedoyin, Marcin Budka, Gokhan Aksu and Huseyin Dogan - Perspectives from Experts on Developing Transaction Monitoring Methods for Anti-Money Laundering
- 13 - Berkan Oztas, Deniz Cetinkaya, Festus Adedoyin, Marcin Budka, Huseyin Dogan and Gokhan Aksu - Enhancing Anti-Money Laundering: Development of a Synthetic Transaction Monitoring Dataset
- 31 - Rahul Kumar Singh, Manoj Kumar Sachan and R.B. Patel - Knowledge adaptation across the domain using iterative scaling and language models

12:00 - 13:00



### Lunch + Networking

Venue: Gallery 1, John Niland Scientia Building

13:00 - 15:00



### Session EBE-04: Big Data Analytics for e-Business - II

Venue: Gallery 2, John Niland Scientia Building

[Teams Link](#)

Chair: TBD

- 63 - Sheng-Kai Wang, Shang-Pin Ma, Chen-Hao Chao and Guan-Hong Lai - Low-code ChatOps for Microservices Systems Using Service Composition
- 45 - Nimalaprakasan Skandhakumar, Nuwan Kuruwitaarachchi, Iresh Ekanayaka, Dilhara Karunanayaka and Thattharani Kandage - Enhancing Devops Infrastructure For Efficient Management Of Microservice Applications
- 70 - Aurèle Zannou, Abderrahmane Leshob, Raqeebir Rab and Pierre Hadaya - A Method for Selecting a Suitable Cloud Computing Deployment Strategy
- 55 - Nour El Houda Boubaker, Karim Zarour, Nawal Guermouche and Djamel Benmerzoug - A Q-learning-based Approach for Optimizing Workflow Migration in Fog Environments
- 44 - Asma Alkhalaf and Farookh Khadeer Hussain - Optimisation of volunteer node selection for scalable and trustworthy Fog environments

### Session EBE-05: Social Commerce for Business Productivity

Venue: The Gonski Seminar Room, John Niland Scientia Building

[Teams Link](#)

Chair: TBD

- 12 - Tendai Mukande, Esraa Ali, Annalina Caputo, Ruihai Dong and Noel Edward O'Connor - A Sparse Sinkhorn Transformer for Multi-Behaviour Recommendation
- 6 - Hui Zhu, Zhong Ning and Mengyuan Shen - Empirical Analysis of the Relationship between Technological Innovation, Technology Spillovers, and Economic Growth Based on PVAR Model —Take Guangdong–Hong Kong–Macao Greater Bay Area as an example
- 42 - Mahyar Shareb-Chakhansar, Marva Mirabolghasemi and Cannan Ramezannia - Antecedents of Social Commerce Adoption in the Tourism Industry: Evidence from a Developing Country
- 16 - Isti Surjandari and Anindya Putri Maulita - Efficiency Analysis of Conventional Commercial Banks in Indonesia: A DEA Approach
- 37 - Yasu Wu, Changlong Fu, Manwen Yang, Haoran Duan and Cheng Xie - Motif Masking-based Self-Supervised Learning For Molecule Graph Representation Learning

**15:00 - 15:15** ○ **Coffee break + Networking**

Venue: Gallery 1, John Niland Scientia Building

**15:15 - 17:15** ○ **Session EBE-06: Blockchain and Cloud Computing for e-Applications**

Venue: Gallery 2, John Niland Scientia Building

[Teams Link](#)

Chair: TBD

- 33 - Suhair Alotaibi, Hada Alsobhi, Ming Zhao and Farookh Khadeer Hussain - Blockchain for Identity Management: Ensuring Trust and Integrity in the Education Sector
- 34 - Samar Alsulaimani, Farookh Hussain and Omar Hussin - Digital Asset Ownership based on Blockchain: A Literature Review
- 36 - Nada A. Alghanmi, Nouf Alghanmi, Hadeel Alhosaini and Farookh Khadeer Hussain - Carbon Credits Storage: A Comparative Multifactor Analysis of On-chain vs Off-chain Approaches
- 20 - Abdullah Abualhamayl, Mohanad Almalki, Firas Al-Doghman, Abdulmajeed Alyoubi and Farookh Hussain - Towards Fractional NFTs for Joint Ownership and Provenance in Real Estate
- 38 - Rasenthiran Kohilan, Tharushi Kitulgoda, Harsha Warakagoda, Nimalaprakasan Skandhakumar and Nuwan Kuruwitaarachchi - A Machine Learning-based Approach for Detecting Smishing Attacks at End-user Level

**Session EBE-07: Diversity, Accessibility and Inclusivity**

Venue: The Gonski Seminar Room, John Niland Scientia Building

[Teams Link](#)

Chair: TBD

- 47 - Paul Whittington, Huseyin Dogan and Nan Jiang - Authenticity Pass: An Accessible Authentication Gateway for People with Reduced Abilities
- 71 - Ching-Lung Lin, Ren Rong Guo, Sheng-Yu Chuang and Ching-Feng Lin - Analysis of Rehabilitation Benefits of IoT Cloud Computing Applied to Elderly Rehabilitation Equipment
- 43 - Theresia Dwi Hastuti, Ridwan Sanjaya and Benediktus Danang Setianto - The Driven Factor of Whistleblower's Intention Using Whistleblowing Systems
- 9 - Jeonghye Han and Yongtaek Shim - Inclusive Design of a Tool to Screen Literacy of Lower Grade Elementary School Students
- 61 - Yi-Ju Cho and Shin-Jie Lee - Utilizing Machine Learning for the Identification of Visually Similar Web Elements

**18:15 - 21:00** ○ **Conference Dinner**

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08:30 - 16:00	<b>Registration &amp; Morning Refreshment</b> Venue: Gallery 1, John Niland Scientia Building	
09:00 - 11:00	<b>Session EBE-08: Big Data Analytics for e-Business - III</b> Venue: Gallery 2, John Niland Scientia Building Teams Link  Chair: TBD <ul style="list-style-type: none"><li>39 - Hanchao Li and Xiang Li - Analyze the Relationship Between Two Similar Stocks: Building the CrC-LSTM Model</li><li>51 - Alireza Faed and Omar Hussain - Observation and Comparison of Incentive Strategies on the Buyer's Decision-making Process</li><li>72 - Chengjie Yang and Wei Qi - Taobao User Purchase Behavior Prediction And Feature Analysis Based On Ensemble Learning</li><li>57 - Digant Singh, Devwardhan Kothari and Lupam K Saha - A Study of Digital Games as a Method of Reducing Stress for Students in the Modern World</li><li>62 - Jun Nian Lo and Shin-Jie Lee - An Empirical Study on Web GUI Load Testing and the Hybrid with HTTP Requests</li></ul> <b>Session EBE-09: Information Learning for e-Business</b> Venue: The Gonski Seminar Room, John Niland Scientia Building Teams Link  Chair: TBD <ul style="list-style-type: none"><li>64 - Shang-Pin Ma, Yu-An Chen, Yi-Jie Guo and Yu-Sheng Su - Semi-Automated Behavior-Driven Testing for the Web Front-Ends</li><li>65 - Iman Aljassasi and Youcef Baghdadi - A Front-end Requirement Engineering Framework of Social Commerce Enterprises (Design-Phase).</li><li>18 - Ronald Petric and David Stiegler - Why Johnny was allowed to send this email: How to better provide transparency in email security towards the recipient</li><li>68 - Yifei Zhao, Kuo-Ming Chao and Yinsheng Li - Domain Information Learning for Multi-Domain Knowledge Graph Link Prediction</li><li>80 - Wan Shu Cheng and Xiaowei Yan - Intelligent Recognition of Immune Cells: Analysis and Research</li><li>77 - Zhuorui Qin, Xiaoqian Wu, Yimin Zheng and Qingyao Wu - Research on Multi-AGVs dynamic scheduling based on deep reinforcement learning</li></ul>	
11:00 - 12:00	<b>Lunch + Networking</b> Venue: Gallery 1, John Niland Scientia Building	
12:00 - 14:30	<b>Session EBE-10: UASACT-Intelligent Systems</b> Venue: Venue Gallery 2, John Niland Scientia Building Teams Link  Chair: TBD <ul style="list-style-type: none"><li>46 - U.K. Hsu, H.B. Chang, Y.Y. Tsai and C.H. Tai - Dynamic Numerical Study of a Rotorcraft Entering and Exiting Rectangular Tunnel</li><li>67 - Je-Yao Chang, Tsu-Yu Lo, Zhi Wei Tan, Shih-Ping Huang, Chih-Ming Kung and Shao-Gang Mao - Wireless Precise Positioning Technology With Application to Autonomous Aircraft Shipborne Landing System</li><li>73 - Zhi-Hao Chen - Based on Intelligent Attack and Defense Command Technology System for Vertical Takeoff and Landing Swarm UAVs</li><li>75 - Hui-Ching Hsieh, Gene Eu Jan and He-Lin Luo - The Applications and Presentations of Drones in Staged Performances and Contemporary Art</li><li>81 - Kuen-Yu Tsai, Guang-Yun Meng, Tung-Ling Wu, Ming-Hui Zheng, Wei-Yao Wang, Chih-Ming Kung, Yen-Chuan Chen, Chi-Fa Huang, Tsang-Chieh Hsieh, Hsin-Sheng Hsu, Huei-Der Lin and Jing-Xiang Sh - eVTOL, UAM, and AAM: Brief Development History and Implementation Outlook of the United States</li></ul>	
14:30 - 14:45	<b>Coffee Break</b> Venue: Gallery 1, John Niland Scientia Building	
14:45 - 15:30	<b>Keynote II - STRONGHOLD: A System for Training Massive-Scale Models with Billions of Parameters</b> Venue: Gallery 2, John Niland Scientia Building Teams Link  <i>Professor Jie Xu, Chair of Computing at the University of Leeds, Director of the UK White Rose Grid e-Science Centre</i>  Chair: TBD	
15:30 - 17:00	<b>Award Ceremony, Networking, and Farewell Refreshments - sponsored by IEEE TCBIS</b> Venue: Venue Gallery 1, John Niland Scientia Building Teams Link	

# Program

Day 1 (Sat 4 Nov 2023)	Day 2 (Sun 5 Nov 2023)	Day 3 (Mon 6 Nov 2023)
09:00 - 12:00 <input checked="" type="radio"/> Social Networking		

