

| Reference | Teaching Associate Proposals  | Principal Supervisor         | Second Supervisor      |
|-----------|---|------------------------------|------------------------|
| AL1       | Enhancing Arithmetic Efficiency in Lattice-Based Post-Quantum Cryptography Hardware Accelerators                                | Amir Sabbagh<br>Molahosseini | Ayesha Khalid          |
| AL2       | Hardware Security for Approximate Computing   | Chongyan Gu                  | Maire O'Neill          |
| AL3       | Explainable AI for Hardware Security  | Chongyan Gu                  | Maire O'Neill          |
| AL4       | Software-Defined FHE: Rethinking Homomorphic Encryption Libraries via Software-Defined Arithmetic Optimizations                 | Amir Sabbagh<br>Molahosseini | Hans<br>Vandierendonck |
| AL5       | High performance processor design for artificial intelligence and machine learning  | Arnab Kumar Biswas           | Maire O'Neill          |
| AL6       | Secure driver monitoring system development   | Arnab Kumar Biswas           | Gary McKeown           |
| AL7       | Hardware assisted homomorphic encryption (HE) acceleration.   | Ayesha Khalid                | Ciara Rafferty         |
| AL8       | Fault tolerant post quantum cryptography systems for satellite communications   | Ayesha Khalid                | Ciara Rafferty         |
| AL9       | Homomorphic encryption: Approximating and Accelerating Privacy-Preserving computation   | Ciara Rafferty               | Chongyan Gu            |
| AL10      | Digital Twins for Empirical Elasticity between the Edge and Cloud   | Dionysios<br>Athanasopoulos  | TBC                    |
| AL11      | Chatbot for Dynamic Data-Oriented Serverless Edge Computing   | Dionysios<br>Athanasopoulos  | TBC                    |
| AL12      | Lossless image compression of multiplex immunohistochemistry images   | Richard Gault                | Des Greer              |
| AL13      | Developing true gigapixel analysis of whole slide histopathology images using deep learning                                     | Richard Gault                | Iain Styles            |
| AL14      | Systems software for energy-efficient computing   | Hans<br>Vandierendonck       | TBC                    |
| AL15      | From Algorithm to Fast Implementation: Compilation Technology to Make High-Performance Graph Analytics Accessible and Efficient | Hans<br>Vandierendonck       | TBC                    |
| AL16      | Causal Network Analysis for Compliance Management   | Hui Wang                     | Karen Rafferty         |
| AL17      | Learning to engineer drugs  | Iain Styles                  | Richard Gault          |
| AL18      | Self supervised learning for information extraction and anomaly detection in scientific images                                  | Iain Styles                  | Richard Gault          |
| AL19      | On the Impact of Compression Techniques on the Security and Privacy of Large Language Models (LLMs)                             | Ihsen Alouani                | TBC                    |
| AL20      | Lightweight AI on Programmable Hardware   | John McAllister              | Yun Wu                 |
| AL21      | Transpilation and Computation for Multicore Quantum Processors  | John McAllister              | TBC                    |
| AL22      | Multimodal Hashing for scalable video retrieval   | Shuyan Li                    | Hui Wang               |
| AL23      | Early warning systems for tropical diseases using Artificial Intelligence   | Mai Thai Son                 | TBC                    |
| AL24      | Drought patterns: Analyzing drought situation in Mekong River Delta   | Mai Thai Son                 | TBC                    |
| AL25      | Deep Multimodal Generation and Retrieval  | Pourya<br>Shamsolmoali       | TBC                    |
| AL26      | Change Detection in Multispectral and Hyperspectral Images Using Deep Neural Networks   | Pourya<br>Shamsolmoali       | TBC                    |

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| AL27 | Exploring security protection for machine learning solutions in O-RAN               | Sandra Scott-Hayward | Vishal Sharma                     |
| AL28 | Post-quantum adversaries in transaction surveillance                                | Vishal Sharma        | Karen Rafferty                    |
| AL29 | Resilient, Real-Time, Approximate AI Accelerators Design                            | Yun Wu               | John McAllister                   |
| AL30 | Energy Efficient v.s. Trustworthy in Multi-modal Federated Learning                 | Yun Wu               | John McAllister                   |
| AL31 | Software Engineering for Artificial Intelligence and/or Machine Learning (SE4AI/ML) | Zheng Li             | Hui Wang<br>Maria Angela Ferrario |
| AL32 | Sociopsychological Software Engineering   | Zheng Li             | Ferrario                          |
| AL33 | Big Data Gravity and Friction Management  | Zheng Li             | Javid Taheri                      |