

Thông tin Học bổng Tiến sỹ

Khoa Khoa học, Kỹ thuật & Công nghệ, đại học RMIT Việt Nam hiện đang có nhiều học bổng Tiến sỹ như sau.

Chi tiết học bổng:

- Học bổng bao gồm toàn bộ học phí học Tiến sỹ và trợ cấp hàng tháng khoảng 14.000.000 VND/tháng.
- Thời gian học: 3-4 năm full-time.
- Nghiên cứu sinh Tiến sỹ tại RMIT Việt Nam, và có thời gian học tại RMIT Australia trong khoảng từ 06 tháng đến 01 năm tùy vào đề tài nghiên cứu.
- RMIT cũng mong muốn hợp tác với các trường Đại học đối tác để đề cử các ứng viên Tiến sỹ theo Dự án 89 nhằm xây dựng hợp tác nghiên cứu.

Yêu cầu đầu vào:

Các yêu cầu tối thiểu để được nhận vào chương trình tiến sỹ:

1. Bằng cử nhân danh dự với thời gian học ít nhất là 4 năm (toàn thời gian) với chuyên ngành liên quan. Chương trình cần có ít nhất 25% học phần nghiên cứu. Ứng viên cần đạt điểm trung bình loại giỏi trong năm cuối; HOẶC
2. Bằng thạc sĩ loại giỏi có ít nhất 25% học phần nghiên cứu trong chương trình học hoặc bằng thạc sĩ loại xuất sắc cho chương trình không có học phần nghiên cứu; HOẶC
3. Bằng cấp về trình độ học vấn và/hoặc kinh nghiệm tương đương.

Yêu cầu về tiếng Anh

IELTS (học thuật): ít nhất 6,5 trung bình (không kỹ năng nào dưới 6.0) hoặc các chứng chỉ tương đương.

Các dự án Tiến sỹ:

Tìm các dự án nghiên cứu tại Khoa Khoa học, Kỹ thuật & Công nghệ, RMIT VN tại **Phụ lục đính kèm**.

Khoa Khoa học, Kỹ thuật & Công nghệ, RMIT Việt Nam là một Khoa thuộc RMIT STEM College, Melbourne, Australia. Danh sách đầy đủ các dự án tiến sỹ thuộc STEM College có thể tìm tại [đây](#). Rất nhiều dự án trong số này có thể được thực hiện tại Việt Nam với sự giám sát chung giữa RMIT Melbourne và RMIT Việt Nam.

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Để tìm hiểu thêm thông tin, vui lòng xem thêm tại các trang sau:

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Do số lượng học bổng có hạn, các ứng viên quan tâm vui lòng liên hệ sớm với Văn phòng Nghiên cứu RMIT Việt Nam để biết thêm chi tiết: phd.enquiries@rmit.edu.vn

Trân trọng,

A handwritten signature in black ink on a light-colored background. The signature appears to be 'D. B. I. C.' or similar, written in a cursive style.

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Growing together with Vietnam

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No	Discipline(s)	SSET Supervisor	Additional Supervisor	Industry 4.0 Framework (Align with Industry Sector)	Industry 4.0 Framework (Align with Research Capability)	Project Title	Project Description (100 words max)
1	Computer Science	Dr Minh Dinh	Dr Elham Naghizade	Digital Health Smart Cities & system	AI & Numerical Modeling	Federated learning using unlabelled sensor and user-generated data	As a machine learning framework mostly suited for large-scale labelled data, Federated Learning could be a key technology to bring fragmented sensitive data, such as live sensor monitoring data, thus enables training a shared global model to improve the accuracy of monitoring services while keeping the sensitive data where they originate. In this project, we investigate how to apply the Federated Learning model to enhance the accuracy and efficiency of the constant monitoring and diagnosis process in different domains, such as within smart cities domain, or in medical domain.
2	Computer Science	Dr Minh Dinh	Prof Zahir Tari	Smart Cities & System	AI & Numerical Modeling	Swarm Learning with Blockchain network to facilitate scalable distributed machine learning on the edge	Traditional distributed machine learning (ML) makes use of a decentralized data pipeline but a central server to host the trained model. Consequently, raw data created on the edge must be sent to and from the central server for processing, thus limits scalability. This project investigates the Swarm Learning approach in which blockchain technology is leveraged to facilitates the exchanging of model training attributes such as weights and biases, that are explored by the individual nodes in the network, without sharing the raw data itself. The project will focus on data exchanging protocols to ensure privacy preservation and to improve the accuracy of the ML model being built independently at each edge node.
3	Computer Science	Dr Minh Dinh	Prof Zahir Tari	Smart Cities & System	AI & Numerical Modeling Cyber Security	Machine-Learning Based Reverse Engineering Technique for Binary Analysis	Reverse engineering (RE) of binaries has useful applications in improving and debugging legacy programs, in refactoring code, and in analyzing and classifying malware. Binary analysis using machine learning-based frameworks, such as Gaussian-based process or support vector machine, has shown the power to automate feature extraction tasks while significantly reduced manual analysis efforts required for large-scale programs. Furthermore, if one views a binary as a collection of bit patterns then it is possible to employ a computer vision framework such as Convolutional Neural Network (CNNs) to recognize known features in a binary. This project aims to develop a binary reverse engineering framework that explores the power of deep neural architectures such as CNN and RNN to identify local features and assemble them to develop a global understanding of the inspected executable.
4	Computer Science	Dr Minh Dinh	Prof Jenny Zhang	Smart Cities & System	AI & Numerical Modeling	Deep Context and Attention-based Techniques for Mining Public Opinion	Public opinion plays an important role in understanding and predicting social behaviors. Such impact has been amplified significantly since the emergence of social media platforms. This study investigates how public opinion can help businesses as well as public servants to enhance their operation and products, customer services, and public services. We propose a framework that collects, processes, and analyses public comment data automatically. This study's overall contributions are (1) the identification and qualification of a range of attributes that form the social-media based public sentiment, and (2) understanding how public opinion enhances the decision-making process, especially in public-policies making.
5	Computer Science	Dr Minh Dinh	Dr Son Hoang Dau	Smart Cities & System	AI & Numerical Modeling	Smart redundancy in distributed computing	Distributed computing is essential when the computational problem is of large scale and cannot be run on a single machine. One critical problem that arises in the context of distributed computing is the straggler effect, that is, one slow machine may become a bottleneck of the whole computation system. To remediate the impact of stragglers, a naive strategy that duplicates the same task on different machines can be employed, which, however, leads to high resource wastage. Can we find a smarter way to create redundancy of the computational tasks to address the problem of stragglers in distributed computing in a more resource-efficient way? This project addresses this question and several related aspects including privacy, security, load balancing, and efficiency of the solutions to the straggler problem.
6	Engineering	Dr Stanley Luong	Prof Anthony Holland			SiC based high voltage high capacity diode design, physics and fabrication	Properties of SiC make it attractive for switched power electronic energy conversion, including a wide band-gap, which allows operation at up to 10kV and junction temperatures in excess of 4000 degree C. Thus, SiC devices are seen as the enabling technology for future energy conversion systems for huge applications which cover a divert fields ranging from military to civilian industry such as the development of High-Voltage, High Frequency (HV-HF) power devices which extend the use of switch-mode power conversion to high voltage applications or development in More Electric Aircraft (MEA). In this project, we will investigate in developing high power diode in term of design, physics and fabrication with SiC materials.
7	Computer Science	Dr Tri Dang	N/A	Smart Cities & Systems	Cyber Security Blockchain	Using blockchain to control and monitor shared information	Protecting privacy is a big concern in today's digital world. When a person visits a website or uses a software application, she must accept its privacy policy either explicitly or implicitly. In addition to agreeing with the stated policy, users also trust that the data collectors only do what they wrote. However, more often than not, this trust has no grounds and is based on personal perception only. To mitigate that problem, this project proposes blockchain-based protocols and techniques users can apply to control and monitor their individual and private information without the need of cooperation from the data collectors.
8	Electrical and Electronic Engineering	Dr Bui Xuan Minh		Smart Cities & Systems	Sustainable Development AI & Numerical Modeling	Online parameters identification of permanent magnet synchronous machine used in wind turbine generation	The penetration of the wind energy into the smart power system has been encountering the technical challenges of electric quality, stability and reliability. Permanent magnet synchronous machines (PMSM) have been dominantly applied in the wind-turbine generation due to their advantages of high-power density, high efficiency and high dynamic performance. However, in practice due to the variation of the machine' parameters, such as permanent magnet flux linkage, stator resistance and inductances in relation to the variation of load and aging factor, the dynamic performance, efficiency and state estimation of this generation system deteriorate. This project proposes a novel method for fast and accurately identifying generator's parameters in real-time, so called on-line method, with the aim of enhancing the control performance of the wind-generation system and improving the stability of the integrated power system. At the same time, the generator's health can be monitored, potential electric failures of the generator can be diagnosed, thus increasing the reliability of the integrated power system.
9	Electrical and Electronic Engineering	Dr Bui Xuan Minh		Smart Cities & Systems	Sustainable Development AI & Numerical Modeling	Machine Learning based Control of the Permanent Magnet Synchronous Motor Drive Systems	Permanent magnet synchronous machines (PMSM) have been widely employed in a number of high-end applications, such as wind turbine generation, electric vehicles, ship propulsion and robotics thanks to its high-power density and high-efficiency. The challenges of these systems in practice are the deteriorated efficiency and control performance during the operation. So far, some methods based on the traditional control theories have been proposed to tackle these challenges. However, the performance of these methods is heavily impacted by the non-linearity of the system and the parameters variation during the operation. This project will develop a novel control scheme using the reinforcement learning algorithm to improve the control performance and efficiency of the PMSM drive system.

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10	Electrical and Electronic Engineering	Dr Bui Xuan Minh		Smart Cities & Systems	Sustainable Development AI & Numerical Modeling	Sensorless Control of the Induction Drive System in the Electric Vehicles	Induction Electric drive systems have been replacing the traditional combustion engines in the automotive industry thanks to their superior advantages such as no gas emission, low production cost, low operation and maintenance cost. The robust control scheme of this electric drive system requires the information of rotor speed and position by using the mechanical encoder or resolver. However, these mechanical devices are temperature dependent and vulnerable to the hostile environment. In order to improve the reliability as well as to reduce the size and cost of the drive system in the electric vehicles, some methods have been proposed to estimate the rotor position and speeds. However, the limitations of these methods are low estimation accuracy at low and very low operation speeds and low estimation bandwidth. This project focuses on the development of a new data driven technique to estimate the rotor speed and position of the induction motor with high accuracy, high bandwidth over the full range of operating speed from zero to the rated value.
11	Electrical and Electronic Engineering	Dr Bui Xuan Minh		Smart Cities & Systems	Sustainable Development AI & Numerical Modeling	Design and Control of a Novel Multiphase Electrostatic Machines	The production of the electric machines requires specific natural resources, which have been raising the environmental and sustainable economic issues. So far, the electric machines have been designed based on electromagnetic principles and dominantly made of materials, such as laminated cores, permanent magnet and the metal conductors (copper or aluminium). In contrast, the electrostatic machines are made of only dielectric and electrodes. Therefore, the elimination of the costly metal conductors, permanent magnet, the laminated cores can reduce the complexity of the manufacturing process and the price of the machines. It can also reduce the carbon emission due to the production of metal conductors and permanent magnet. This project aims to develop a novel prototype and control scheme of a multiphase electrostatic machine with high efficiency, simple structure and low cost for the applications under high temperature conditions or sensitive to magnetic fields.
12	Engineering	Dr Alexandru C Fechete	Professor Anthony Holland Professor Andrew Greentree	Smart Cities & Systems	System Development & IoT	Modelling of robustness and resilience space-based electronics	The space environment is a challenging one for electronics. There are high levels of both ionizing and nonionizing radiation, combined with large changes in temperature, depending on whether they are in shade or not. This extreme environment presents challenges for the materials and design of space-based electronics. This project aims to model radiation response and thermal process for electronic components designed for space applications. We will develop a new, multi-scale, multi-physical disciplinary modelling methodology, combining radiation modelling, device-level, and whole circuit simulations. Outcomes from this research will inform the design of electronics for space applications.
11	Computer Science	Sam Goundar	Ron Van Schyndel Son Hoang Dau	Smart Cities & System	Artificial Intelligence Cyber Security	AI-based Smart IoT Processing of Images & Videos during Surveillance	Smart IoT devices and Surveillance cameras capture images and videos, sending them directly to the Cloud-based servers for analysis. Globally, visual data generated from IoT Surveillance cameras are overwhelming and there is a drastic need for re-designing the devices for the video and image data gets converted automatically into relevant, timely, actionable intelligence and more importantly redefine the device health and life of that device to operate with the highest efficiency, optimum processing, consume low power. Artificial intelligence and deep learning algorithms can be adopted to work on the data captured, power consumed, computing performed, storage used to provide efficient processing and performance, and low data transmission.
12	Computer Science	Sam Goundar	Iqbal Gondal Qiang Fu Zahir Tari	Smart Cities & System	Internet of Things (IoT) Cyber Security	A Secure Framework to Mitigate IoT Environment against Security Vulnerabilities	This project proposes implementing IoT ecosystem and then performing hardware and firmware attacks to determine security holes. Middleware interactions from the IoT hardware to cloud would also be reviewed for cloud-network specific vulnerabilities for further attacks. Finally, an audit methodology would be proposed with relevant and exhaustive reports on vulnerabilities identified. IoT is a growing market and will be the future of our daily lives. Because of its emergence, there is no standard to guide the development process, there are many protocols and custom solutions to connect a hardware device to the cloud. The project outcomes can be used to help IoT device makers to develop secure IoT devices.
13	Computer Science	Sam Goundar	Xun Yi Iqbal Gondal Zahir Tari	Smart Cities & System	Artificial Intelligence Cyber Security	Zero-Day Threat Detection and Prevention of Cyber Attacks in Data Centre Power Grids using AI	The main objective of the project is to protect the power grid and UPS of digital data warehouses and data centres from cyber-attacks by framing an AI based multi-level cyber shield. The system design is collaborative of multi-agents to monitor various activities, an agent for network infrastructure surveillance, a software agent to detect malicious viruses, agent to filter the network traffic, agent to secure data backup monitoring, agent to update security policies etc. Multi-agent based algorithm is designed to handle data regression, clustering of similar data items, classification of untrusted data, vulnerable management, Thread hunting, internal temperature monitoring, backup power monitoring, and analysing massive quantities of risk data.
14	Computer Science	Sam Goundar	Hai Dong Fengling Han Ibrahim Khallil	Smart Cities & System	Blockchain System Development	Modified Practical Byzantine Fault Tolerance (MPBFT) Algorithm - A Novel Protocol for Achieving Consensus in Blockchain Networks	This project proposes to develop a novel protocol for achieving consensus in blockchain networks. The proposed protocol intends to overcome the disadvantages of the Proof-of-Work (PoW) consensus mechanism by overcoming issues like high usage of computing resources and delay in confirmation of new blocks over the blockchain. Simulations will be run, and our proposed algorithm modified until we come up with the modified algorithm that reduces the CPU utilization by a defined percentage and confirms the twice number of blocks when compared with the original Proof-of-Work algorithm. The Modified Practical Byzantine Fault Tolerance (MPBFT) Algorithm will then be suitable for consortium based blockchain networks.
15	Computer Science	Sam Goundar	Ibrahim Khallil Shabnam Kasra Son Hoang Dau	Smart Cities & System	Blockchain System Development	A Transparent, Distributed, and Secure Platform for Crowdfunding based on Blockchain	Online crowdfunding platform powered through blockchain brings transparency and accountability. This could possibly improve the scale of business since more and more people would now like to fund the ventures as each individual is aware of the utilization of the funds. The blockchain technology builds upon the Industrial Internet (Industry 4.0), a transparent and secure environment for the people and the transactions. This project intends to develop an application based on blockchain that has the potential to improve the security and reliability of the transactions. Since the control in blockchain based technology is decentralized, it will effectively address the monopoly over the funds and improve accountability.
16	Computer Science	Sam Goundar	Zahir Tari Xun Yi Iqbal Gondal Ronald Kumar, SBM, RMIT Vietnam	Advanced Manufacturing Transport and Logistics Smart Cities & Systems	Blockchain System Development	Blockchain Smart Contracts for Autonomous Supply Chain Management and Operation	Due to the COVID-19 pandemic, there has been a disruption in the global and local supply chain as the supply chain was managed with humans in charge of the supply chain system. Although almost all supply chains are controlled with Supply Chain Management systems, it still requires human intervention and participation. With the lockdown, the humans couldn't participate or intervene to manage the supply chain and therefore the lock down disrupted the supply chain and, in some cases, it came to complete shutdown. This project proposes to develop a fully automated supply chain management system running on blockchains and self-managed and monitored with smart contracts as a solution to prevent any future disruptions.

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17	Computer Science	Sam Goundar	Fabio Zambetta Iqbal Gondal Margaret Hamilton Ushik Khwakhali, SSET, RMIT VN	Digitally Enabled Education Smart Cities & Systems	Artificial Intelligence Reality Systems Development Virtual Reality & Augmented Blockchain	Metaverse and Artificial Intelligence for Next Generation Educational Technology Platforms	This project uses Metaverse and Artificial Intelligence to develop an educational technology platform and training programs that are challenging to offer in real-world setting. Meta-Education has the potential to radically transform the teaching and learning landscape. It's power, though rudimentary is already realised with the use of VR, AR, XR, and MR in existing educational platforms. It has been cheaper, easier, and safer to provide STEM education using these, rather than risking training in real-life scenarios. Trainee neurosurgeons and pilots are a good example. Artificial Intelligence will ensure that the Meta-Education platform follows the rules prescribed by the Teacher. Artificial Intelligence is also the enabler of simulation based STEM training. For learners to be able to get the feel of training in the authentic world, Artificial Intelligence is needed to ensure learners are able to work and learn with intelligent NPC tutors, peers, and other learners.
18	Computer Science	Sam Goundar	Iqbal Gondal Margaret Hamilton Ronald Kumar, SBM, RMIT Vietnam	Smart Cities & System	Cyber Security	Resolving the Current Skills Gaps in Cyber Security Education – A Vietnam Survey	The recent escalation in the number of cyber-attacks and online crime has made cybersecurity an increasingly urgent challenge at a time when digital technologies are transforming national economies and the daily lives of citizens. It is important that national and regional strategies which address these risks to digital security are supported by tertiary education and training programmes that provide graduates and trainees with the necessary knowledge and expertise about cyber security. As society is becoming increasingly dependent on digital technology, cybersecurity is an issue of great concern to governments, industry, and organisations of all types. This project aims to better understand the gaps that exist between the knowledge and skills of the young graduates entering the cybersecurity workforce and the cyber security needs of the industry.
19	Computer Science	Sam Goundar	T.B.A. from RMIT Melbourne T.B.A. International Universities	Smart Cities & System	Cyber Security Blockchain	Blockchain-based Multi Factor Authentication for Securing Cloud Servers	Since the COVID-19 pandemic, we have been digitally transformed without being aware of it (Prybylski, 2022; Forbes; Stackpole, 2021; MIT). This means internet traffic has increased by 60% (OECD, 2020), and 30% more people are now working from home (McKinsey, 2021). Cyber threats have increased by 81% (McAfee, 2021). There is a need to enhance cyber security with blockchain technology and multi factor authentication. We aim to enhance cyber security by hashing the public cloud servers. Additionally, we are going to require users to login via blockchain and use a centralised multi factor authentication. These enhancements will be significant because it will keep the users secure from cyber-attacks. It will contribute towards SDG 3, 8, 9, and 11. Blockchain technology provides trust, transparent and immutable transactions. Our expected outcomes would be the design specifications of servers with their conceptual models to protect our digital economy and keep everyone cyber secured.
20	Computer Science	Sam Goundar	T.B.A. from RMIT Melbourne T.B.A. International Universities	Digital Health Smart Cities & System	Artificial Intelligence Internet of Things (IoT) Systems Development Cyber Security	Analysing Brainwaves for Prevention and Treatment of Mental Illness using Artificial Intelligence and Internet of Things	We propose to design a device that can detect signs of mental illness at initial stages so that the person could start the treatment as soon as possible. Regular analysis of the 'brainwaves' will be uploaded at a central location and will be compared with previous readings as well as from the standard analysis that will be fed into the system to detect signs for various illnesses. The privacy of the patient and security of the data will be taken into consideration while developing the device and the application. The device would be based on IoT (Internet of Things) along with the use of machine learning and artificial intelligence. The IoT part would take care of his connection with devices such as mobile, etc. or to a cloud server. Whereas ML and AI would be used for its background functioning that would be training the data and predicting the disease.
21	Computer Science	Sam Goundar	T.B.A. from RMIT Melbourne T.B.A. International Universities	Smart Cities & System	Blockchain System Development Cyber Security	FinTech Applications and GDPR Privacy Requirements: How Do We Comply?	Blockchain based FinTech applications are transparent, trusted and based on consensus. Nothing is hidden, kept secret or private. Public blockchains emphasize openness as a key characteristic that enables auditability. However, users still value the ability to keep information that is non-relevant to the transaction private, such as their identity. There are two main concerns around privacy for users: identity privacy and transaction privacy. In order to comply with regulations in Fintech industry, for example, Anti-Money Laundering and Financing of Terrorism (AML-CFT), when required, the transactions' information must be revealed to authorized agencies. What frameworks are needed to maintain privacy and comply with authorities seeking information? In what format do we send, receive, and do transactions so that it satisfies the above?
22	Computer Science	Sam Goundar	T.B.A. from RMIT Melbourne T.B.A. International Universities	Smart Cities & System	Blockchain System Development Cyber Security	A Secure, Equitable, and Energy Efficient Protocol for Cryptocurrency Networks	Cryptocurrencies are going mainstream and becoming an acceptable form for payments and other financial transactions (US Government's Republican Policy Committee, 2022; Hougan, Forbes.Com, 2022). However, ever since its introduction via the Satoshi Nakamoto white paper in 2008, it has been plagued with high energy consumption, security risks, scalability issues, slow processing speed, and high transaction costs. Many protocols have been proposed to overcome these issues. Most cryptocurrency networks use Proof-of-Work (PoW) or Proof-of-Stake (PoS). The problem with these two protocols is that PoW gives preference to users who have spent a lot of money to setup their supercomputers, while PoS gives preferences to users that have more coins. Therefore, the rich getting richer paradox. We propose a secure, equitable and energy efficient protocol called Proof-of-Evidence (PoE). Our protocol keeps the users secure by keeping them inside a perimeter network within the DMZ. We ensure that everyone on our proposed network gets a chance to add a block of transactions and get rewarded. Because there is no competition to add transactions, normal computers are used and therefore the energy requirements are low and efficient.
23	Computer Science	Sam Goundar	T.B.A. from RMIT Melbourne T.B.A. International Universities	Smart Cities & System	Artificial Intelligence System Development Sustainable Development	Dynamic Disaster Relief Distribution Modelling with AI based Fuzzy Petri net	Relief distribution during natural or man-made disasters is a collection of support actions that assist people in returning to their everyday lives after it has been disrupted. Its goal is to mitigate the effects of disasters by delivering needed relief goods to the right people at the right time and in the right place. One of the most critical aspects to consider is uncertainties related to changes in the relief distribution system, as minor disruptions could have severe consequences for planning outcomes. The failure of a single essential route, for example, might cause significant disruptions in resource allocation strategy. This proposal outlines a research project which applies formal methods for modelling the dynamic circumstances of a disaster-affected region based on artificial intelligence based fuzzy Petri nets, fuzzy set theory and stochastic modelling techniques
24	Engineering	Dr Minh Tran	Professor Songlin Ding (RMIT School of Engineering)	Advanced Manufacturing	Digital Twins AR&VR	Digital twin assistance for smart manufacturing	Digital twin is considered as an innovative and essential tool for smart industry and currently has been applied to various industries including automotive, aerospace, and maritime engineering. The project focuses on investigating the digital twin for smart manufacturing application in which the robotic system can automatically recognize the dimension variation on the stock and obstacles around its operating zone, and avoid collision in real time with feedback data. This will allow safe remote control and failure prediction via preventive maintenance.

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25	Aviation	AP Alberto Bernabeo	A. Prof. Ceruti Alessandro (UNIBO, Italy)		Digital Twins AR&VR	ENHANCED SOLUTIONS FOR BLENDED LEARNING in AVIATION TRAINING	This study focuses on addressing in-class engagement, the learning performance, and practical training of low experienced pilots to improve their performance on both classroom and simulator training. The Target population of this study consists of pilots attending their frozen ATPL course, with very low or without flight experience on complex high-performance aircraft. These pilots are mainly post-millennials, which have grown up in a highly technological environment. Research indicates that they tend to process information differently from previous generations, and they have a different attitude toward learning. The scope of the study is to identify new learning and training methodologies, which could fit the learning characteristics of the Target population and optimise the integration of learning tools such as - but not limited to - Virtual Reality (VR) and Augmented Reality (AR) in the training curricula.
26	Aviation	AP Alberto Bernabeo	Prof. Piancastelli Luca (UNIBO, Italy)	Transport and Logistics Smart Cities & Systems	Sustainable Development	Study and testing of a green trainer to transform small general aviation aircraft for training into a no-emission aerial vehicles	LAQ and noise aviation emissions effect the quality of life and health. Air pollution is the number one environmental cause of premature death in the European Union. Despite progress in recent decades, it still causes more than 400,000 premature deaths every year, and it brings respiratory and cardiovascular diseases to millions. While the aviation contribution is estimated to 0.4% of the total deaths attributed annually to global air quality degradation, aviation has a substantial impact on local air pollution around airport areas and efforts are ongoing to reduce it further. Aircraft noise remains a matter of concerns for airports and local authorities despite significant improvements, due to anticipated increase of total number of flights in Europe (could reach 12.8 million by 2035 – despite the present COVID-19 disruption). Regarding the reduction of local air quality (LAQ) from NOx and particulate matter (PM), the selected technologies may consider sustainable drop-in and non-drop-in fuel options, aligned with EU industrial roadmaps and R&I activities in topic HORIZON-CLS-2021-DS-01-05. Regarding the reductions of aviation noise around airports, the selected technologies should consider propulsion and aircraft-propulsion integration interdependencies as well as operational air-traffic management procedures.
27	Aviation	AP Alberto Bernabeo	Prof. Tositti Laura (UNIBO, Italy)		Artificial Intelligence Virtual Reality & Augmented Reality Systems Development	Aircraft Cabin Air Quality Assessment of Long-term Effects of Contaminants	The general objective of this research project is to enable step-advances in the analysis of the issues raised by contamination events resulting from oil leakage (incl. oil pyrolysis products) on board commercially operated large transport aeroplanes and the potential toxicological risks in light of the existing European standards and legislation on the quality of indoor air and professional exposure limits.
28	Aviation	AP Alberto Bernabeo	A. Prof. Ceruti Alessandro (UNIBO, Italy)		Sustainable Development Modelling and Simulations	Horizon Europe Project: Digital Transformation – Case study 1: Application of digital 'twin' concept for the design verification of VTOL and drones.	The research project aims at evaluating a series of changes applied to aviation products, processes and operations resulting from the deployment of new digital solutions with a focus on measuring the impact on safety standards and regulatory materials as well as to prepare their evolution. The project will build upon a series of case studies allowing to develop a comprehensive investigation of the key changes at stake, by developing several working examples (use cases and conceptual models), analysing the impact on the working processes, the safety management processes, and the existing regulatory standards. Such case studies will lead to the identification of key actions to be taken by safety regulators, service and solution providers to streamline the deployment of such innovative digital applications.
29	Aviation	AP Alberto Bernabeo	RMIT AU		Sustainable Development Virtualisation	Horizon Europe Project: Digital Transformation – Case study 2: Use of the blockchain technologies for the management of aircraft parts throughout their lifecycle.	The research project aims at evaluating a series of changes applied to aviation products, processes and operations resulting from the deployment of new digital solutions with a focus on measuring the impact on safety standards and regulatory materials as well as to prepare their evolution. The project will build upon a series of case studies allowing to develop a comprehensive investigation of the key changes at stake, by developing several working examples (use cases and conceptual models), analysing the impact on the working processes, the safety management processes, and the existing regulatory standards. Such case studies will lead to the identification of key actions to be taken by safety regulators, service and solution providers to streamline the deployment of such innovative digital applications.
30	Aviation	AP Alberto Bernabeo	AP Ceruti Alessandro (UNIBO, Italy), Manny and Ondris (RMIT, SCD)		Sustainable Development Data Science Applications	Horizon Europe Project: Digital Transformation – Case study 3: Use of flight training data to support the application of evidence-based / competency-based training concepts. Case study 4: Application of new analytical methods and techniques for fuel management (pre-flight / in-flight). Case study 5: Data models for enhancing the use of operational or training data for safety.	The research project aims at evaluating a series of changes applied to aviation products, processes and operations resulting from the deployment of new digital solutions with a focus on measuring the impact on safety standards and regulatory materials as well as to prepare their evolution. The project will build upon a series of case studies allowing to develop a comprehensive investigation of the key changes at stake, by developing several working examples (use cases and conceptual models), analysing the impact on the working processes, the safety management processes, and the existing regulatory standards. Such case studies will lead to the identification of key actions to be taken by safety regulators, service and solution providers to streamline the deployment of such innovative digital applications.
31	Aviation	AP Alberto Bernabeo	AP Ceruti Alessandro, AP Laura Tositti (UNIBO, Italy), Dr Manar Fawzi Bani Mfarrej (Zayed University, UAE)	Transport and Logistics Smart Cities & Systems		Air Quality Monitoring (Alberto with SBM, UNIBO, Zayed University)	The Objective of this project is to make an interdisciplinary study related to the reduction of CO2 and other GHG (green house gases) emissions while at the same time offering an analysis on how the foreseen increment in the (air) traffic in Vietnam can become sustainable. The proposal is also intended to create synergies between different entities developing dedicated competencies related to environmental/climate changes and challenges. Not only Aircraft operators in the Vietnam will benefit from this proposal which aims to: •Collect data related to CO2 and other GHG emissions •Monitor the transport performance in tonne-kilometres •Create a simulation of CO2 and GHG emissions with reference to the new technologies available in the (aviation) sector. The main advantage of this analysis is to help Vietnam in establishing: 1. long term strategies in order to have a sustainable (air) transport 2. interconnections with Industry 4.0, Digital Transformation and Smart Cities.
32	Aviation	AP Alberto Bernabeo	AP Ceruti Alessandro (UNIBO, Italy), Manny and Ondris (RMIT, SCD)	Sustainable Development Modelling and Simulations	Artificial Intelligence Virtual Reality & Augmented Reality Systems Development	TBC	TBC
33	Materials Modelling & Materials Modelling	Dr Peter Claiden	Dr Cuong Nguyen	System Development	Numerical Modelling	Device for remote detection of advanced manufacturing process and security screening	This project proposes a novel type of detector with applications in the advanced manufacturing and security sectors. Previous funding has come from the Atomic Weapons Establishment and UK Ministry of Defence. The device employs nanoparticles with responses that are close to the quantum/classical limit. Physical experimentation and testing are already possible but in addition the project will explore theoretical limits of the materials to improve performance parameters

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34	Computational Engineering	Dr Cuong Nguyen	Prof Klaus Hackl (RUB, Germany)	Smart Cities & Systems	AI & Numerical Modeling	Computational modelling and simulation of advanced engineering materials using data-driven approach enhanced by machine learning	Traditional simulations in computational mechanics rely on two very different types of equations. The first one is about universal laws such as conservations of mass, momentum and energy, whereas the second one is related to material models which are calibrated from experimental material data. It is well-known that the second type of equations contains modeling errors and often fails in matching with new experimental findings. In order to take advantage of data science, the experimental data sets are used directly in simulations. Specifically, we try to minimize the distance between the phase-space derived from universal laws and the cloud of data points obtained from experiments. Machine learning is found to be promising in providing efficient techniques for solving this minimization problem.
35	Computational Engineering	Dr Cuong Nguyen	Dr Minh Dinh	Smart Cities & Systems	AI & Numerical Modeling	A forecasting machine learning pipeline for phase-field modeling of mixed-mode fracture problems	Fracture is one of the most typical failure modes of many natural and human-made materials such as concrete, rock, ceramic, metals and biological soft tissues. In order to predict crack initiation and propagation efficiently, the phase-field paradigm has gained significantly popularity over the past decade. Using the phase-field variable helps us to model the crack propagation process without undergoing the mesh refinement of finite element models. However, the main drawback of phase-field modeling lies at the expensively computational cost due to the requirement of using sufficiently fine meshes. To predict faster the results of mixed-mode fracture problems, we combine a phase-field model with a time-series forecasting method. Specifically, in order to build a forecasting machine learning pipeline we utilize two time-series forecasting approaches: a statistical method namely ARIMA and a neural network learning-based method, namely LSTM. Regarding findings already established in our research team, we successfully implemented the pipeline for modelling mode-I cracks (tensile).
36	Computational Engineering	Dr Cuong Nguyen	Dr Minh Dinh & Dr Thao Nguyen	Smart Cities & Systems	AI & Numerical Modeling	Physics-informed neural networks enhanced by Sobolev training for computational modelling	Computational modeling has been becoming an important part in understanding and optimizing many engineering systems. Despite great achievements using numerical discretization techniques of partial differential equations arising in computational simulation, incorporating noisy data into existing algorithm is not straightforward, generating finite-element mesh remains complex, solving high-dimensional problems is still challenging. Physics-informed neural networks has emerged as a promising alternative, but the low rate of convergence has been considered as the main weakness of this approach. In this project, we develop and implement the Sobolev-training for physics-informed neural networks with the aim to obtain a more efficient machine learning procedure in dealing with a variety of problems in computational modeling. Specifically, by incorporating derivatives information into the loss function, we are able to guide the neural network toward effectively reducing errors in the corresponding Sobolev space. Applications of the proposed approach can be found in solving forward and inverse problems appearing in many fields such as computational elasticity, plasticity and fracture mechanics.
367	Cyber Security	Dr Jonathan Crellin	Dr Thanh Nguyen	Smart Cities & Systems	Cyber Security	Cybercrime in Vietnam: Typology	A survey from public sources of cyber crime attacks that have been reported. Review attack vector(s), attack type, success or failure, estimated cost, threat actor if known, and originating region or country. Cyber crime remains dynamic and adaptive, and is likely to continue to evolve and continue to threaten industry and commerce (and the public sector) in the Vietnamese economy. One of the fundamental problem is developing a methodology for collecting and evaluating data from multiple public sources, and may include dark web sources.
38	Cyber Security/Education	Dr Jonathan Crellin	Dr Thanh Nguyen	Digitally enabled education, Smart Cities and Systems.	Cyber Security Education and Training	Cyber Security Education in Vietnam	A survey of educational avenues in cyber security in Vietnam. Compare 'commercial' and 'academic' approaches in terms of content, cost, and effectiveness in employment opportunities.
39	Computational Methods	Dr Nguyen Hieu Thao	Prof Michel Verheagen (TU Delft) Dr Oleg Soloviev (TU Delft)	Signal Processing Computer Vision	Optimization Fourier Optics	Nonuniform Defocus Removal - an Approach from Convex Optimization	We study the anisoplanatic deconvolution problem given a single nonuniform defocused image from a mathematical point of view, called the Nonuniform Defocus Removal (NDR) problem. The problem naturally arises in many imaging applications, yet little has been known about its solution methods because it is typically ill-posed and generally unsolvable without additional knowledge of the solution. Defining the NDR problem in a specific, yet practically relevant setting, we verify its key mathematical properties and establish rigorous convergence analysis of the proposed solution. The so-called Defocus Removal (DR) algorithm is proposed for the NDR problem and its global convergence is established without imposing any unverifiable conditions. Other important features of the DR algorithm such as solvability, robustness against noise and sensitivity to model deviations are numerically studied. An imaging experiment is conducted to demonstrate the physical relevance of the mathematical model of the NDR problem and the potential of the DR algorithm. Regarding the data of the NDR problem, we consider the more challenging case where the nonuniformly defocused images are not dividable into isoplanatic subimages. In other words, the NDR problem is not reducible to a number of simpler isoplanatic deconvolution problems. This is the main difference of this paper compared to most of the previous works on nonuniform defocus removal, where the data image typically captures several objects each with different, yet approximately constant defocus value. As a consequence, solution methods partitioning the image into isoplanatic zones are not applicable to the NDR problem and those handling the entire data image such as the proposed DR algorithm need to be developed and analyzed.
40	Medical Informatics Public Health	Dr. Arthur Tang	Dr. K.O. Kwok Dr. E.K. Yeoh Dr. S.Y.S. Wong Dr. M. Ip Dr. B.H.M. Ma Dr. E. Hui (Chinese University of Hong Kong)	Medical Informatics Public Health	Simulation and Modelling Digital Health	A Multifaceted Approach in Advancing Infection Control and Prevention Practices in Residential Care Homes for the Elderly (RCHes) in Hong Kong	This project employs a multifaceted approach in infection control and prevention in Residential Care Homes for the Elderly (RCHes), including (1) Diagnostic, (2) Prophylactic, (3) Control, (4) Infection Profiling, and (5) Modelling and Simulation. The primary focus of the project is on Antibiotic Resistance Microbes (AMR) and Antibiotic Use. The objectives are (1) to compile a package of infection control strategies feasible in RCHes setting to reduce AMR infection and transmission; (2) to construct a common infections profile in RCHes; and (3) to establish essential epidemiological parameters for simulation and modelling.

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41	Computational Meth	Dr Nguyen Hieu Thao	Prof Michel Verheagen (TU Delft) Dr Oleg Soloviev (TU Delft)	Image Processing Superresolution	Optimization Image reconstruction	Subpixel image reconstruction using nonuniform defocused images	This paper considers the problem of reconstructing an object with high-resolution using several low-resolution images, which are degraded due to nonuniform defocus effects caused by angular misalignment of the subpixel motions. The new algorithm, indicated by the Superresolution And Nonuniform Defocus Removal (SANDR) algorithm, simultaneously performs the nonuniform defocus removal as well as the superresolution reconstruction. The SANDR algorithm combines non-sequentially the nonuniform defocus removal method recently developed by Thao et al. and the least squares approach for subpixel image reconstruction. Hence, it inherits global convergence from its two component techniques and avoids the typical error amplification of multi-step optimization contributing to its robustness. Further, existing acceleration techniques for optimization have been proposed that assure fast convergence of the SANDR algorithm going from rate $O(1/k)$ to $O(1/k^2)$ compared to most existing superresolution (SR) techniques using the gradient descent method. An extensive simulation study evaluating the new SANDR algorithm has been conducted. As no algorithms are available to address the combined problem, in this simulation study we restrict the comparison of SANDR with other SR algorithms neglecting the defocus aberrations. Even for this case the advantages of the SANDR algorithm have been demonstrated.
42	Computer Science	Dr Vinh Truong		Digital Health	Image Processing	Improving Food Safety and Public Nutrition using Artificial Intelligence technologies	Vietnamese street food is well-known worldwide. Nearly every individual and family is able to prepare and sell their own special delicacies. However, this level of popularity also raises a lot of issues with regard to public health. Local government agencies have made every effort to control food safety by tightly registering food distributors and suppliers, constantly inspecting the hygiene level of food storage, and closely observing the level of germs on the food dishes. However, these efforts are insufficient given the enormous volume of food that is produced, delivered, and sold daily. As a result, a number of high-profile food safety incidents have been recorded in recent years (Ammar et al., 2022). Difficulties with food nutrition exist in addition to problems with food safety. The truth is that there isn't much nutritional information available for street cuisine. When this information is typically not provided, local consumers find it challenging to maintain a healthy diet. To help better regulate the situation and improve the safety and health of the public, a cutting-edge technology solution powered by artificial intelligence is required for the issues of food safety and food nutrition. Prior research likewise concentrated on the characterization and classification of the foods, but not on their characteristics related to safety and health (e.g., bacteria, hygiene and calorie levels). They concentrated on intricate foods like noodles and pizzas rather than simple ones like seeds and meat (Rejeb et al., 2022). With regard to Vietnamese cuisine, this study aims to investigate how big data can be used to categorize food in terms of its safety and health based on its forms, colors, textures, molds, and morphology against the guidance set in United Nations Sustainable Development Goals and Australian Guide for Healthy Eating. A large dataset of 50,000 food photographs was utilized in the study to train an AI program and test it against a set of 1,000 images. Theoretically, this research advances our knowledge of layered objects (Kim & Kim, 2022). Based on the setting of Vietnamese street meals, this study helps promote public safety and health in relation to food.
43	Computer Science	Dr Vinh Truong		Industry 4.0 in the education	Online education	The effects of Covid-19 on students' performance	The Covid-19 pandemic has dramatically changed the way students and teachers conventionally communicate, teach and learn. To learners, Covid-19 is not only about distance learning but also about physical and mental health. However, little has been known about its integrated effect on students' performance. This study evaluated the impact of Covid-19 on students' grades and marks in highly interactive subjects and less interactive ones on both highly performed students and poorer ones. Theoretically, this study helps us understand more about the integrated effect of distance learning and unhealthy learning on students' performance in a long term. Practically, educators could apply the findings to better personalise their school teaching and learning activities during pandemics and crises to maintain the individual performance of their students in a long term.
44	Computer Science	Dr. Bao Nguyen	T.B.A. from RMIT Melbourne T.B.A. International Universities	Computer Vision	Artificial Intelligence, Image Processing	Classify the interior design concepts using deep learning	Interior style classification is an interest problem which brings potential applications in both commercial and academia communities. This task aims to devise interior design styles automatically. Thus, interior designers will explore customer's tastes and they will correctly provide suggestions for decor inspiration based on customer's preference. Recently, Convolutional Neural Networks (CNNs) have been considered the de-facto standard in computer vision tasks. Therefore, several current works have tended to address interior style classification using CNN-based architectures. Recently, transformer-based architectures and attention-based encoder-decoder models also have been proved successfully in both computer vision task as well as natural language processing task. Moreover, there are many works arguing the efficiency of combining CNN-based architectures and transformer-based architectures for normal image classification problem. To find out the architecture network that is satisfied for interior style classification problem. In this study, we propose a robustness method to address interior style design classification, named ISC-DeIT. This proposed method based on Data-efficient image transformer architectures and knowledge distillation that is able to be trained on small datasets effectively, and a proposed addition module is plugged to leverage learning feature representations, improves the predictive accuracy.
45	Computer Science	Dr. Bao Nguyen	Prof Yoshiaki Shirai (Ritsumeikan) Prof Paolo Avesani (Trento Uni)	Computer Vision	Artificial Intelligence, Image Processing	Fashion Image Captioning with Attention Mechanism	Image captioning aims at generating a natural language description for an input static image. Advanced by recent developments of deep learning, many captioning models rely on an encoder-decoder based paradigm, and it has been found effective for this task. Encoder-decoder models use a Convolutional Neural Network (CNN) to encode the input image into a compact hidden representation. Then, followed by a Recurrent Neural Network (RNN) to decode this representation and generate word-by-word sentence to form a natural language description of the image. In this project, we propose an appropriate model for fashion image captioning which is inspired from the channel attention mechanism combined with spatial attention to enhance attention on the details of fashion attribute. The channel attention mechanism is designed to insight into the deep features representation rather than only the spatial dimension. By incorporating between channel attention and spatial attention, the proposed model would be able not only to represent the relationship between items inside the input fashion image, but also to mention the detail attributes of clothes such as texture, fabric, shape, style, etc.

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46	Computer Science	Dr. Bao Nguyen	Prof Yoshiaki Shirai (Ritsumeikan) Prof Paolo Avesani (Trento Uni)	Computer Vision	Artificial Intelligence, Image Processing	Outfit Compatibility Prediction Towards Occasion	Fashion is an integral part of a human life, because people are more comfortable and confident when they dress well. However, outfit compatibility is not only a combination of different items but also regarding various aspects such as style, user preference, and specific occasions. Most of existing works only lead to address the outfit compatibility concerning style or user preference. In this paper, we try to address not only the outfit compatibility problem, but also the recommending item for the missing one in a sequence of fashion items, call fill-in-the blank (FITB) tasks. More specifically, we propose an efficient method for outfit compatibility and the fill-in-the blank tasks according to specific occasions. To this end, we utilized an auxiliary classification branch to learn the significantly important features regarding specific occasions. Besides, a sequence to sequence approach is also applied to learn the relationship of different items along with a visual semantic space, which is able to learn the connection between visual features and their semantic presentation.
47	Electronics Engineering & Computer Systems	Dr. Stanley Luong	Dr. Ron Van Schyndel Prof. Anthony Holland	Computer Vision	Image Processing, Mini/Micro Electronics Portable Hardwares Design	Navigational assisted device for the blind.	This project will investigate methods which derived from a multi-discipline input from Electronics Engineering, Computer Science, Software Engineering to formulate solutions in term of hardware, software, algorithm to realise a practical device to assist blind people in daily navigation.