

Doctor of Engineering (EngD)

Graduate Programmes Office
School of Computing and Information Systems
Singapore Management University

The SMU EngD virtual info session will begin at 6:00pm (Singapore Time).
Please take note of the following:



Turn off
your
video



Mute your
microphone



EngD Brochure
smu.sg/EngDbrochure



EngD Application
Key Information
smu.sg/EngDinfo



Why Choose EngD @ SMU



Speaker

Michelle Cheong

Professor of Information Systems (Education)
Associate Dean, SCIS Post-Graduate Professional Education
Director, Doctor of Engineering

Objectives

To engage industry in digital transformation and practice scholarship

- To train ICT manpower with deeper technical skills to conduct industry-focused R&D
- To attract high calibre professionals to conduct practice research with our faculty
- To build practice research into the identity and branding of SCIS

Scope of Practice Scholarship

1. Design prototype IT systems and implement them in business setting, collect data and study the effectiveness of the systems
2. Perform translational research to deploy research output in real IT applications
3. Develop practice guidelines and frameworks for industry IT applications
4. Architect systems for large-scale IT implementation
5. Contribute to international/national IT technical standards
6. ...

SCIS Research Areas

CORE RESEARCH AREAS - CREATE COMPUTING TECHNOLOGY AND SYSTEMS



Artificial Intelligence & Data Science

✘ Data Management & Analytics

✘ Intelligent Systems & Optimisation

✘ Machine Learning & Intelligence



Human-Machine Collaborative Systems

✘ Pervasive Sensing & Systems

✘ Multimedia

✘ Human-Computer Interaction



Information Systems & Technology

✘ Software Engineering & Systems

✘ Cybersecurity

✘ Information Systems Management

INTEGRATIVE RESEARCH AREAS - DIGITAL TRANSFORMATION IN ACTION



Computing Practice & Education

✘ Technology-Enhanced Learning

✘ Computing Curriculum & Pedagogy

✘ Analytics & Decision Support Practice

IT Practice-Methodologies, Architectures & Framework



Urban Systems & Operations

Crowd Management

Urban Mobility & Smart Commuting

Urban Logistics & Sustainability

Maritime Traffic Management



Active Citizenry & Communities

Community Crowdsourcing & Crowdtasking

Job & Skill Intelligence

Lifestyle & Wellness Intelligence

Urban & Social Analytics



Safety & Security

Optimisation of Security & Civil Resource Deployment

Security of Digital Platforms & Devices

Privacy-Preserving Data Sharing & Analytics

Cybersecurity Regulations & Policies

Graduate Learning Outcomes

Upon completion of the professional doctorate training, graduates would be able to:

- Apply deep tech knowledge in practical scenarios
- Exercise critical ability and power to analyse problems
- Develop tools and solutions that feature deep technology
- Address problems of interest critical to industry partners
- Engage in community-based learning for practice research
- Adhere to and advocate high levels of research integrity and ethical standards for practice research outcomes

Graduate LOs of SCIS-EngD vs PhD in IS/CS

S/N	Category	SCIS EngD	SCIS PhD IS and PhD CS
1	Nature of scholarship	Examples of practice scholarship <ul style="list-style-type: none"> - Design prototypes and study their effectiveness in organizations - Translate academic research to real applications - Develop guidelines and frameworks for industry applications - Architect systems for large-scale deployment - Contribute to technical standards 	Examples of academic scholarship <ul style="list-style-type: none"> - Computing theory - Protocol design - Computational models - New technological capability
2	Primary career	Tech leadership in professional practice	Academia, technology R&D
3	Measures of learning	3-5 articles in professional venues, e.g., ACM and IEEE magazines	3-5 articles in academic venues, e.g., ACM and IEEE transactions
4	Coursework	6 CUs	6 CUs
	Professional foundation	3 CUs in translational research seminars, MITB professional seminars, scientific writing and presentation	Nil
	Research foundation	3 CUs in empirical research projects (ERPs)	4 CUs in empirical research projects (ERPs) 2 CUs in Advanced Research Topics (ARTs)
	Dissertation	28 CUs	28 CUs
	Total Course Units	40 CUs	40 CUs

Programme Schedule (Full-time)

Year	Term 1	Term 2	Term 3
One	Courses (2 CUs)	Courses (2 CUs)	Courses (2 CUs) + ERP (1 CU) + Scientific Writing & Presentation (1 CU)
	Library Training Part 1 and 5 Seminars (1 CU)		
Two	ERP (1 CU) + Prepare for Qualifying Exam (QE)	ERP (1 CU) + Qualifying Exam (QE) + Form Dissertation Committee + Prepare Dissertation Proposal	+ Submit Written Dissertation Proposal + Oral Defense of Proposal
	Library Training Part 2 and 5 Seminars (1 CU)		
Three	Conduct Dissertation Project	Conduct Dissertation Project + Prepare the Design & Implementation	Conduct Dissertation Project + Present and defend the Design & Implementation
Four	Conduct Dissertation Project	Conduct Dissertation Project + Submit Written Report of Completed Dissertation	Oral Defense of Dissertation + Revise & Re-submit Report + Submit Approved Report to PGR Programme Office (28 CUs)

Programme Schedule (Part-time)

Year	Term 1	Term 2	Term 3
One	Courses (1 CU)	Courses (1 CU)	Courses (1 CU) + ERP (1 CU)
	Library Training Part 1 and 5 Seminars (1 CU)		
Two	Courses (1 CU) ERP (1 CU)	Courses (1 CU) ERP (1 CU)	Courses (1 CU) + Scientific Writing & Presentation (1 CU)
	Library Training Part 2 and 5 Seminars (1 CU)		
Three	+ Prepare for Qualifying Exam (QE)	Qualifying Exam (QE) + Form Dissertation Committee + Prepare Dissertation Proposal	+ Submit Written Dissertation Proposal + Oral Defense of Proposal
Four	Conduct Dissertation Project	Conduct Dissertation Project	Conduct Dissertation Project + Present and defend the Design & Implementation
Five	Conduct Dissertation Project	Conduct Dissertation Project + Submit Written Report of Completed Dissertation	Oral Defense of Dissertation + Revise & Re-submit Report + Submit Approved Report to PGR Programme Office (28 CUs)

Residency Period:

- EngD students are encouraged to spend a minimum of two blocks of five working days at SMU during the third year of their candidature and are **required to do so during the fourth and fifth year of their candidature** (total of two weeks in duration per year).
- The study period at SMU is crucial as it serves as important interaction time between EngD students, supervisors and fellow doctoral students. There will be planned activities for the candidate such as research seminars, discussions, some intellectual exchanges, etc.

Programme Structure

Component	Course Units (CU)
Coursework¹ <ul style="list-style-type: none"> • Technical Foundation Courses: SCIS PhD Courses • Technology Application Courses: MITB Courses Option to: <ul style="list-style-type: none"> • <i>replace up to 1 CU of Technical Foundation Course via cross-enrolment into other SMU academic/professional doctoral course</i> OR <ul style="list-style-type: none"> • <i>replace up to 1 CU of Technology Application Course via cross-enrolment into other SMU professional master's degree course</i> 	6 2-4 2-4 0-1
Professional Foundation Course <ul style="list-style-type: none"> • Scientific Presentation & Scientific Writing • Translational Research Seminars, MITB Professional Seminar Series & Library Training 	3 1 2
Research Foundation <ul style="list-style-type: none"> • Empirical Research Projects (ERP): 1 CU per term for 3 terms² 	3
Doctoral Dissertation	28
TOTAL	40

¹ Alumni of SMU Master of IT in Business (MITB), Master of Applied Information Systems (MAIS) or MSc in Computing, who have graduated within the last 5 years, may be exempted up to 4 CUs of matching courses to the EngD programme.

² There is flexibility that ERP can begin in Year 1 Term 1 for candidates to begin their small-scope applied research earlier, which candidates can build towards their final dissertation project.

Technical Foundation Courses (SCIS PhD Courses)

Course Code	Course Title
IS702	Information Security
IS703	Algorithms and Optimization* [@]
IS715	Systems Security* ^{@+}
IS711	Learning and Planning in Intelligent Systems
IS706	Software Mining and Analysis* [@]
IS708	Mobile and Distributed Systems*
IS713	Foundations for Data Analytics
IS712	Machine Learning ⁺
CS701	Deep Learning and Vision
CS702	Computational Interaction
CS703	Optimization and Computing

Note: [@] Not offered in AY2022/23

^{*} Offered once every 2 years

⁺ Mutually exclusive with MITB's Applied Machine Learning and Cybersecurity Technology

Technology Application Courses (Selected MITB Courses)

Financial Technology (FINTECH)	Analytics Technology & Applications (ANALYTICS)	Artificial Intelligence & Applications (AI)	Information Technology Management (TECH)	Digital Transformation (DT)
Data Science in Financial Services	Data Management	Introduction to Artificial Intelligence	IoT: Technology & Applications	Agile & DevSecOps
Corporate Banking & Blockchain	Data Analytics Lab	Algorithm Design & Implementation	Cybersecurity Technology & Applications+	Digital Enterprise Architecture
Digital Payments & Innovations	Applied Statistical Analysis with R	Applied Machine Learning+		
Quantum Computing in Financial Services (New)	Customer Analytics & Applications	Deep Learning for Visual Recognition		
RiskTech & RegTech (New)	Big Data: Tools & Techniques	Natural Language Processing for Smart Assistants		
	Visual Analytics & Applications	Multi-Agent Systems		
	Text Analytics & Applications	AI Planning & Decision Making		
	Social Analytics & Applications	Recommender Systems		
	Process Analytics & Applications	Machine Learning Engineering (New)		
	Data Science for Business	AI System Evaluation (New)		



Note: + Mutually exclusive with PhD's Machine Learning and Systems Security

EngD Courses
smu.sg/EngDcourses

EngD Academic Plan & Report

(A) EngD Study and Research Plan

- This study and research plan must be discussed and confirmed with respective Chair and Co-Chair of the EngD Programme.
- Please update the study plan once a year and submit to the EngD Admin Office by end of 1st term of study for every AY during the EngD candidatures

(B) Meeting with EngD Supervisors Report

- Students must meet respective supervisors for discussion on EngD progress/review at least ***six times*** a year.
- Form must be submitted to EngD Admin Office by Friday, end of 3rd study term. If Friday is a public holiday, then submission must be made one working day earlier (e.g. Thursday)

Qualifying Exam Process

EngD QE comprises of:

- Oral examination (one Open session and one Closed door session), and
- Written examination

Full-time students: QE is scheduled in the **second year, second term, week 8** and students are given a maximum of two attempts. Student should **pass QE by end of year two.**

Part-time students: QE is scheduled in the **third year, second term, week 8** and students are given a maximum of two attempts. Student should **pass QE by end of year three.**

Graduation Requirements

- **Course completion (12 CUs)**
 - Disciplinary courses (6 CUs)
 - Professional Foundation Courses (3 CUs)
 - Research Foundation-ERP (3 CUs)
 - Minimum cGPA of 3.0/4.0
- **Successful completion of the Doctoral Dissertation (28 CUs)**
- As a guideline, candidates are expected to have 3-5 conference/journal papers in the pipeline at the time of dissertation defence. The papers should meet the standard of the whitelisted publication venues for SCIS Term Track faculty.
- In the event that the dissertation submitted by an EngD candidate does not meet the minimum 3 potential publications and the Dissertation Committee decides to pass the candidate, there must be valid and strong supporting justification

Admission Criteria

- Applicant must hold at least a Bachelor's degree with good honours. Having a Master degree is a plus, but not mandatory
- Substantial work experience in the tech industry with vertical domains, with good understanding of industry problems
- Good GMAT/GRE/SMU Admission Test (for NUS, NTU, SMU, SUTD grads) → must match MITB admission requirements. ***MITB, MSc in Computing or MAIS alumni who graduated with min CGPA of 3.4/4.0 within 5 years of application may be exempted***
- Good TOEFL (min 90) or IELTS (min 6.5) scores for applicants whose medium of instruction at the Bachelor/Master level was not English
- Cover Letter
- Curriculum Vitae
- Degree Certificates and Transcripts
- Personal and Research Statements
- Recommendation or Reference Letters
- Applicants will be interviewed to determine suitability



EngD Application
Key Information
smu.sg/EngDinfo

SCIS Term Faculty Profiles



EngD Term Faculty
smu.sg/EngDfaculty

EngD Students



Tristan LIM Ming Soon

Lecturer

Full-Time EngD Student (August 2021 intake)

Designing a Gamified Heutagogical Multimodal Assessment (GHMA) Framework with AI-driven Learning Analytics for Technology and Innovation Education.



Brindha Jeyaraman

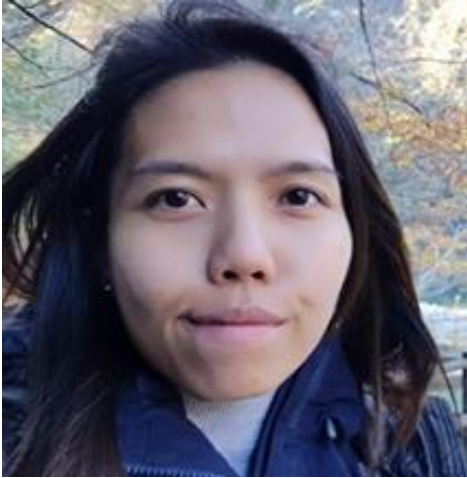
Deputy Director, Data Analytics, Monetary Authority of Singapore (MAS)

Part-Time EngD Student (August 2021 intake)

Implement a Gesture Recognition system using Machine Learning techniques.

Deep Learning in the Fintech Industry for Credit Risk Prediction, Microeconomic prediction, Stock Market Prediction, Portfolio Management and Stock Trading

EngD Students



Nurul Asyikeen Binte AZHAR

Data Scientist, PACE Analytics, Rio Tinto
Full-Time EngD Student (August 2020 intake)

Data Scientist at Rio Tinto implementing tweaked data science methods to derive solutions to business problems.

Multi-Agent based Market Simulation for Trade Flow and Price Determination in Upstream Supply Chain Market.



TAN Ming Hui

Data Scientist, Procter & Gamble
Part-Time EngD Student (August 2020 intake)

Research focuses on the integration of traditional data sources with geospatial analytics to drive smarter decisions.



Programme Fees

	Amount	Remarks
Application Fee	S\$100	One-off
Registration Fee	S\$400 (SC/PR) S\$500 (others)	One-off
Tuition Fee*	\$107,000 (include prevailing GST)	S\$12,000 (deposit upon acceptance, include prevailing GST) Refer to the Payment Schedule at smu.sg/engdfees for full-time and part-time tuition fee billing.
Over-staying Fees	S\$10,700 per year (include prevailing GST)	From the 5 th year onwards for full-time students; 6 th year onwards for part-time students

Goods and Services Tax (GST) is a tax collected on behalf of the Singapore Government and will be charged at the prevailing rate. The amount illustrated above is based on current prevailing GST at 7%. Note that GST will be changed from 7% to 8% on 1st January 2023. The applicable total amount payable will be charged accordingly.

Tuition Fee*

10% discount on tuition fees will be given to all SMU graduates.
 The discount will be applied to all tuition fee billings.



EngD Fees
smu.sg/EngDfees

Scholarships Administered By External Organizations



Singapore Digital (SG:D) Scholarship (Postgraduate)

Singapore Citizens



EngD SG:D
smu.sg/EngDdigital

EDB Industrial Postgraduate Programme IPP Scholarship

Singapore Citizens or Singapore Permanent Residents.



EngD EDB IPP
smu.sg/EDB-IPP

A*STAR Graduate Scholarship (AGS)

Permanent residents and non-Singaporeans who are awarded either the NSS (PhD) or AWP will be required to take up Singapore citizenship



EngD A*Star
bitly.ws/vmRJ

Vingroup Young Talent Scholarship

Candidates of Vietnamese Origin



EngD VG
Scholarship
smu.sg/EngVG

IP Matters

1. Self-funded candidates

- **Self-funded students will own their work** however, they will have to grant to SMU a perpetual royalty-free and worldwide licence to store, publish, print and reproduce their work.

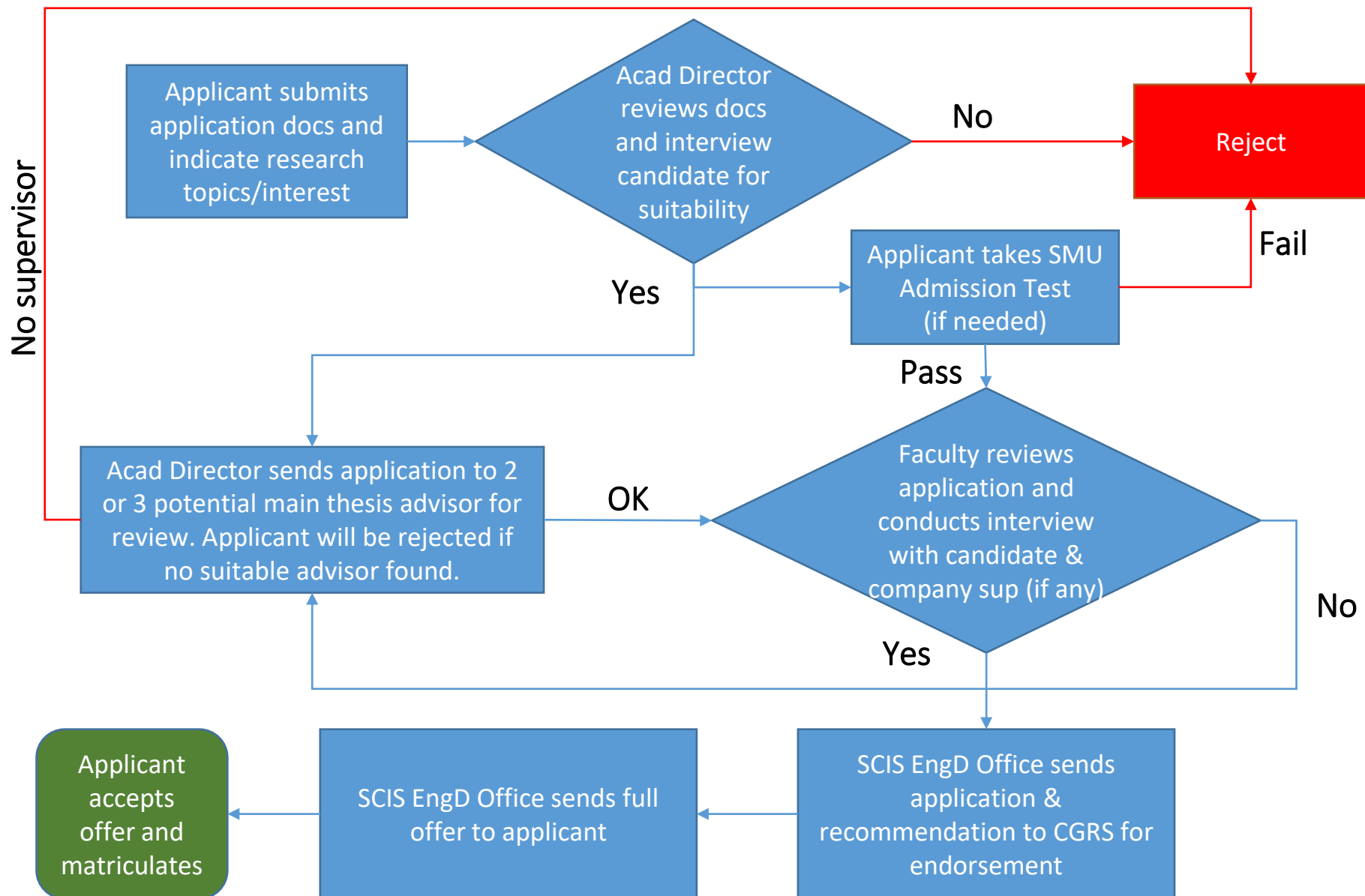
2. Self-funded candidates using company resources

- IP assertion rights have to be agreed **between the company and the student**. However, they will have to grant to SMU a perpetual royalty-free and worldwide licence to store, publish, print and reproduce their work.

3. EDB IPP funded candidates

- For Project IP, the University shall have the non-exclusive, royalty-free rights to use the IP for academic, R&D, and other non-commercial purposes. The **University and the Company** shall agree on the terms and conditions relating to the ownership and commercialisation of the Project IP (“IP Arrangements”).

EngD Application Process



Apply Now!

Contact Details:

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School of Computing and Information Systems 2
90 Stamford Road
Singapore 178903
Tel: (65) 6808 7901
Email: engd@smu.edu.sg

Website:
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