SMU PhD IN INFORMATION SYSTEMS

SMU PhD

Technology and management research for real-world impact

SINGAPORE MANAGEMENT UNIVERSITY

Aims of Programme

Mission

The Singapore Management University (SMU) offers the PhD in Information Systems programme. The programme produces PhD graduates with expertise that straddles between the Information Technology (IT) and business sectors for Research and Development (R&D) units and applied academic institutions.

Goal

The programme develops researchers and educators who address deep technology challenges in real-world information systems that impact business processes or management, or who develop tools and methodologies to translate business goals into technological solutions.

Our PhD graduates are capable of collaborating with faculty members from different research areas and designing technological solutions for real-world problems and applications, while producing top-rated academic publications.

Our Value Proposition

Interdisciplinary Work

Our PhD students are trained to work across research areas. The curriculum covers five areas that have high market demands – **Cybersecurity; Data Management & Analytics; Information Systems & Management; Intelligent Systems & Decision Analytics; and Software & Cyber-Physical Systems.**

Applied Research

The programme provides opportunities for students to work with industry data sets and commercial platforms. Students will learn to conduct their research in the context of real information systems and business goals.

Industry-relevant Training

Our PhD students will acquire professional skills that are important in industrial R&D, such as intellectual property management. Students will have opportunities to network with academic researchers and industry practitioners.

Employment Prospects of Graduates

R&D units require PhD graduates with an integrated view of business and IT to complement graduates from other institutions who are trained to work on component technologies.

Academic institutions, particularly software schools, require PhD graduates with skills in application and systems building, as well as in management.

Industry requires PhD graduates capable of developing tools and methodologies that translate business goals into technology requirements, and who can build technology-based solutions that contribute to revenue growth or cost reduction.

Students' Achievements

Distinguished / Best Paper Awards

Best Paper Award (2015)	Best Paper Award (2013)	Best Workshop Paper Award (2012)	Distinguished Paper Award (2012)
Sougata SEN	**Chee Meng Tey**	**Kiat Wee Tan**	**Qiang Yan, Jin Han**
Sensing Systems and Applications Using Wrist Worn Smart Devices (WristSense)	Network and Distributed System Security (NDSS) Symposium	Special Interest Group on Data Communication (SIGCOMM)	Network and Distributed System Security (NDSS) Symposium

In the headlines

Discovery of iOS security flaws

TODAY, 3 Oct 2013

A*STAR, SMU researchers first to discover iOS security flaws

The Straits Times, 3 Oct 2013

Singapore team helps plug flaws in Apple devices

Lianhe Zaobao, 3 Oct 2013

Local researchers found three security weaknesses in Apple's iOS operating system (Translated)

The Straits Times, 2 Oct 2013

Apple fixes iOS7 after Singapore researchers identify flaws

Selected Graduates' Professional Appointments after SMU

Post-Doctoral Fellow Leibniz University of Hanover, Germany	Software Engineer Alibaba, China Google Zurich Samsung Research America Twitter, Inc., USA
Research Scientist Institute for Infocomm Research (I2R), A*STAR, Singapore DSO National Laboratories, Singapore HP Labs, USA New York University, Abu Dhabi TCS Innovation Labs, Bangalore	Data Scientist Booking.com, Netherlands

Areas of Research Concentration

Cybersecurity

- Data Security & Privacy
- Mobile Platform & Application Security
- IoT & RFID Security & Privacy
- Computer & Software Security
- Multimedia Content Security
- Cloud Computing Security
- Human Behaviour-Based Security

Data Management & Analytics

- Data Mining & Machine Learning
- Consumer & Social Network Analytics
- Information Retrieval & Multimedia Analytics
- Spatial & Context-Aware Data Management
- Recommender Systems & Preference Analytics
- Visual Analytics
- Data Privacy & Authentication

Information Systems & Management

- Economics of IS & Technology
- Social Media Marketing & Digital Strategies
- Platform, Networks & Markets
- Information Products & IT Services
- IT & Supply Chain Management
- Financial IS & Technology
- Design, Innovation & Entrepreneurship

Intelligent Systems & Decision Analytics

- Autonomous Agents & Multi-Agent Systems
- Learning & Adaptation
- Heuristic Search & Optimisation
- Planning & Scheduling
- Business Simulation & Serious Gaming
- Urban Logistics, Transportation & Sustainability
- Cognitive Computing & Decision Support Systems

Software & Cyber-Physical Systems

- Mobile & Wearable Systems & Testbeds
- Cyber-Physical & IoT Systems
- Interactive & Wearable Computing Interfaces
- Software Mining & Program Analysis
- Software Testing & Debugging
- Empirical Software Engineering
- Cloud & Enterprise Systems & Applications

Students can undertake their PhD studies in any of these research areas. SMU encourages research activities that integrate several of these areas.

Through SMU's Interdisciplinary Doctoral Programme, students could combine their PhD work in Information Systems with work in Economics, Marketing or Psychology.

Curriculum Structure

This is a direct PhD programme, with a maximum candidature period of five years for full-time students. The curriculum comprises coursework (12 Course Units) in addition to a dissertation (28 Course Units).

Graduate Coursework: In the first two years of study, students will enrol in intensive courses to build their research depth and breadth, as well as professional skills.

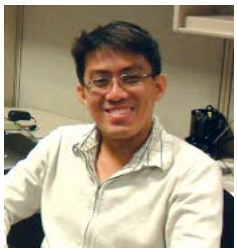
Depth Requirements: Students will enrol in the advanced course in their respective primary areas and undertake research apprenticeships with their primary advisors. Each advanced course covers important research papers on key topics and techniques that students need to be acquainted with in order to undertake area-specific research.

Breadth Requirements: Students will attend courses in the five areas of research concentration shown above. These requirements are intended to help PhD students establish their networks and to expose them to industry practices. In addition, students will attend the advanced course in one of the breadth areas.

Professional Skills: To round up the PhD training, the curriculum includes workshops on English Communications; Information Systems Research Methodology; Intellectual Property Management; Research Writing and Presentation; and teaching skills.

Students' Experiences

Internships



Freddy Chua
Intern (Jun-Sep 2012)
Hewlett Packard Research Labs (HP Labs)
Silicon Valley
California, USA

At HP Labs, I was part of the Social Computing Group managed by Bernardo Huberman. I was asked to propose a research project that will benefit the business objectives of HP Labs based on stipulated requirements. I undertook the research project by writing computer programmes and performing experiments to verify the research results. When I presented my findings to HP Labs, they found my results useful and are considering taking the project to the next stage. The company is currently filing a patent for my work. Although the internship was for a short three months, I consider the delivery of results in this span of time a great achievement! The internship helped me gain experience in independent research and will definitely be useful to me in the future.

Students on the programme have also completed internships at:

- Alibaba Group (Hangzhou, China)
- Google Inc. (Mountain View, California, USA)
- IBM Research Lab (New Delhi, India)
- Microsoft Corporation (Redmond, Washington, USA)
- Samsung Information Systems America, Inc. (Santa Clara, California, USA)
- Yahoo! Research Lab (Barcelona, Spain)

Overseas Training Residencies (LARC-CMU exchange)

Since 2011, SMU, in collaboration with Carnegie Mellon University (CMU) through the SMU Living Analytics Research Centre (LARC, https://centres.smu.edu.sg/larc), provides our students with overseas training residencies. Selected PhD students from any of SMU's PhD programmes may spend up to ten months at CMU. The research work of these students is directly linked to LARC projects, and they conduct their dissertation research on these projects under the joint supervision of SMU and CMU faculty.

Selected Dissertations

CYBERSECURITY

- Security and Privacy in RFID-Enabled Supply Chain (Shaoying Cai, 2014)
- Towards Secure and Usable Leakage-Resilient Password Entry (Qiang Yan, 2013)
- Novel Techniques of Using Diversity in Software Security and Information Hiding (Jin Han, 2012)

DATA MANAGEMENT & ANALYTICS

- User Behaviour Mining in Microblogging (Tuan Anh Hoang, 2015)
- Event Identification and Analysis on Twitter (Qiming Diao, 2015)
- Social Correlation in Latent Spaces for Complex Networks (Freddy Chong Tat Chua, 2014)

INFORMATION SYSTEMS & MANAGEMENT

- Pricing Strategy for Cloud Computing Services (Jianhui Huang, 2014)
- The Valuation of User-Generated Content: A Structural, Stylistic and Semantic Analysis of Online Reviews (Noi Sian Koh, 2011)

INTELLIGENT SYSTEMS & DECISION ANALYTICS

- Dynamic Queue Management for Hospital Emergency Room Services (Kar Way Tan, 2014)
- Robust Execution Strategy for Scheduling Under Uncertainty (Na Fu, 2012)

SOFTWARE & CYBER-PHYSICAL SYSTEMS

- Enabling Real-Time In-Situ Context-Based Experimentation to Observe User Behaviour (Kartik Muralidharan, 2015)
- Ranking-based Approaches for Localising Faults (Lucia, 2014)

"I often get asked why I chose to do my PhD at SMU. What initially drew me towards this university was the kind of research being done, particularly in the Software & Cyber-Physical Systems research group. I was keen on building systems that had real world applicability and they were doing just that! Having spent 5 years at the SMU School of Information Systems (SIS), I can state that the SMU PhD in Information Systems programme is structured towards providing the right balance between research and application. Research centres such as LiveLabs, the Living Analytics Research Centre and iCity Labs have active collaborations not only with academia but also with industry. Such collaborations provided me with opportunities to spend a year at Carnegie Mellon University as well as to interact with other faculty members and individuals who became instrumental at different stages of my dissertation work.

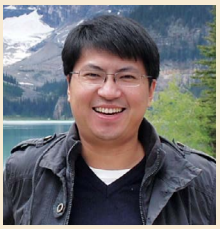
But it is not just about work. SIS has a vibrant community where I made several long-lasting friends. I had a wonderful time at SMU and today I am a proud alumnus."

Kartik Muralidharan
Research Scientist
TCS Innovation Labs
Bangalore, India

> In the different stages of the SMU PhD programme, I was exposed to various aspects of research. I participated in multiple projects on data analysis and mining. These projects helped me to acquire a solid background in big data analysis, improved my work and communication skills, and more importantly, gave me a concrete view of research work. In addition, I had opportunities to collaborate on projects with experts of other disciplines which taught me how computational methods may benefit research across disciplines. All these valuable experiences have gradually developed me into an independent researcher, and have also given me the confidence to build an academic career.

Tuan Anh Hoang
Post-doctoral Fellow
Leibniz University of Hanover
Germany

> Before entering the School of Information Systems (SIS) at SMU, I was just an undergraduate who knew nothing but coding. After more than 4 years in the SMU PhD in Information Systems programme, I received an enriching research experience. The programme not only made me become an independent Information Systems (IS) security researcher with high-quality publications, but it also enriched me in many other ways like enhancing my English communication skills and broadening my knowledge base on other IS areas. These valuable experiences and skills finally helped me find a dream job in one of the top IT companies.



Jin Han
Research Engineer
Twitter, Inc.
United States of America

Admission and Application

ADMISSION REQUIREMENTS

At least a good Bachelor's degree.
A Master's degree is useful but not required.

Good GRE or GMAT results.

Good TOEFL or IELTS scores.
For applicants whose medium of instruction at the Bachelor's/ Master's level was not English.

Submission of the following documents:

Identity Card/Passport
Latest Curriculum Vitae
Degree Certificates and Transcripts
Personal and Research Statements
Recommendation and/or Reference Letters

APPLICATION INFORMATION

The PhD in Information Systems is a full-time programme. The University's application windows are listed below.

Intake	Opening Date for Application	Closing Date for Application
August	1 November (of prior year)	31 January (of intake year)
January	1 April (of prior year)	30 June (of prior year)

Details of programme fees and application procedure can be found at **http://smu.sg/phdis**

Financial Assistance Schemes

SMU awards two types of scholarships on a competitive basis. We assess applicants for different award schemes at the time of admission based on qualification and suitability for these schemes.

SMU SCHOLARSHIPS

The scholarship covers registration and subsidised tuition fees. This scheme also provides successful recipients with monthly living stipends.* The scholarship is renewed yearly, conditioned on good academic performance, for a maximum duration of four years. Beyond the scholarship duration, students who have been on the scholarship may receive continued support through research and teaching assistantships or industry grants.

SMU PRESIDENTIAL DOCTORAL FELLOWSHIP

The SMU Presidential Doctoral Fellowship* is awarded to exceptionally qualified students who enrol into SMU's PhD programmes as well as to existing PhD students who have outstanding academic performance. The Fellowship is a one-year award that is renewed annually, for up to four years.

* The stipend rates are published on SMU's PhD site at **http://graduatestudies.smu.edu.sg/phd** and are subject to change.

A Unique University in Vibrant Singapore

SMU has been designed to provide a different model of university education in Singapore.

A STRONG AND INNOVATIVE RESEARCH CULTURE

- Internationally recognised for its world-class research and distinguished teaching conducted by faculty members who joined us from top universities.
- Faculty members collaborate on cross-disciplinary work to generate impactful and real-world relevant ideas, over and above research in their own disciplines.
- Faculty members establish research centres and institutes to conduct problem-driven research and influence industry practice across a wide range of topics.

A DIFFERENT LEARNING APPROACH

- Faculty members encourage an interactive learning environment through inquiry, participation and teamwork.
- Seminar-style teaching in small classes for optimal student-instructor interaction.

STATE-OF-THE-ART INFRASTRUCTURE

- Research facilities including proprietary and published databases.
- SMU's library (for access to many publications and other necessary materials).

Being in the heart of the city, students will have easy access to industry partners who provide research data and validation platforms.

Each School has dedicated personnel to take care of students' administrative needs. Furthermore, many SMU research centres and institutes provide post-doctoral fellowships and/or research assistantships that add value to students' research experience.

SMU
SINGAPORE MANAGEMENT UNIVERSITY

General Office, Level 5
School of Information Systems
80 Stamford Road
Singapore 178902

http://smu.sg/phdis (65) 6828 0125 sis_phd@smu.edu.sg (65) 6828 0919