



SMU Academic Research PhD Programmes:

**PhD in Computer Science/
PhD in Information Systems**

School of Computing and Information Systems (SCIS)

**Creating Value for
Business & Society
Through Innovative IT Solutioning**

Presented by:

**Prof Zheng Baihua
Associate Dean (SCIS Postgraduate Research Programmes)**

School of Computing and Information Systems



ESTABLISHED
in year **2003**



VISION

An IT school that is admired for the innovation, reputation and relevance of our research and education



MISSION

To create computing knowledge for the digital transformation of business and society, and apply it in training IT professionals in value-creating solutioning



STATISTICS UPDATED ON
31 August 2022

FACULTY

79 Full Time Faculty
29 Teaching Instructors
68 Research Staff

SUPPORT

39 Administrators

ENROLLMENT

2206 Undergraduates (UG)
144 Postgraduate Research (PGR)
515 Postgraduate Professionals (PGP)

PhD in Computer Science/Information Systems

**COMPUTING
TECHNOLOGY AND
PRACTICE SCHOLARSHIP IN
SOLUTION DEVELOPMENT**



To develop researchers/educators...

- Who address deep technology challenges in real computing/information systems that impact business or society, or
- Who develop tools and methodologies to translate business goals/societal issues into technology solutions.

PhD graduates will be capable of:

- Collaborating with faculty members from different research areas,
- Designing technology solutions for real-world problems and applications,
- While still producing top-rate academic publications.

Full-Time PhD Scholarship

- All full-time PhD students admitted to SMU are awarded SMU Scholarships.
- Subject to satisfactory progress, the award will cover registration fee, and tuition fees, in addition to providing a monthly living stipend for 4 years.
- Monthly Stipend Rate for Students

Scholarship	Before Qualifying Examination (international students / Singapore Citizen)	After Qualifying Examination (international students / Singapore Citizen)
SMU Presidential Doctoral Fellowship in Computing	SG\$3,750 / SG\$5,000	SG\$3,750 / SG\$5,000
SMU Scholarship	SG\$2,200 / SG\$2,800	SG\$2,700 / SG\$3,300

- Financial Assistance Schemes are available which allow students to work as Research Assistant, Teaching Assistance or Graduate Instructor on a part-time basis after they cease to receive the scholarship stipends.

Other PhD Scholarships

- AI-SG Fellowship 
 - Monthly of stipend of **SG\$5,000** for international students/**SG\$6,000** for local students for up to four years of studies at SMU
 - Full-amount of tuition fee
 - Generous conference trip support, especially for top-tier publications

- A*STAR Computing and Information Science (ACIS) Scholarship
 - Monthly of stipend of **SG\$3,750** for international students/**SG\$5,000** for local students for up to four years of studies at SMU
 - Full-amount of tuition fee
 - Support of up to 12 months of oversea attachment
 - Other allowances, e.g., computer allowance/book allowance/conference allowance



Research Conference Support



- Travel grants are available to support PhD students' paper presentations at international and local conferences
- Examples of Conferences attended by our PhD students in 2022
 - ACL'22: the 60th Annual Meeting of the Association for Computational Linguistics, Dublin, Ireland
 - AAI'22: the 36th AAI Conference on Artificial Intelligence, virtual conference
 - ICSE'22: the 44th International Conference on Software Engineering, Pittsburgh, PA, USA
 - ICAPS'22: the 32nd International Conference on Automated Planning and Scheduling, virtual conference
 - ICLR'22: the 10th International Conference on Learning Representations, virtual conference
 - ICML'22 : the 39th International Conference on Machine Learning, Baltimore, US
 - KDD'22: 2022 ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, Washington DC, US
 - MM'22: the 30th ACM International Conference on Multimedia, Lisbon, Portugal
 - WWW'22: the Web Conference 2022, virtual conference

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-Machine Interaction



INFORMATION SYSTEMS & TECHNOLOGY

- Software Engineering & Systems
- Cybersecurity
- Information Systems Management

COMPUTING @ SMU

Build Twin Pillars of Academic Scholarship and Practice Scholarship

Academic Research

Tenure Track



Translational & Practice Research

Term Tracks

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



Research Oriented PhD Programmes

CSRankings: Computer Science Rankings

CSRankings is a metrics-based ranking of top computer science institutions around the world. **Click on a triangle (▶)** to expand areas or institutions. **Click on a name** to go to a faculty member's home page. **Click on a chart icon** (the after a name or institution) to see the distribution of their publication areas as a . **Click on a Google Scholar icon** () to see publications, and **click on the DBLP logo** () to go to a DBLP entry. *Applying to grad school? Read this first.* **Do you find CSrankings useful? Sponsor CSrankings on GitHub.**

Rank institutions in by publications from to

All Areas

AI

- ▶ Artificial intelligence
- ▶ Computer vision
- ▶ Machine learning & data mining
- ▶ Natural language processing
- ▶ The Web & information retrieval

Systems

- ▶ Computer architecture
- ▶ Computer networks
- ▶ Computer security
- ▶ Databases
- ▶ Design automation
- ▶ Embedded & real-time systems
- ▶ High-performance computing
- ▶ Mobile computing
- ▶ Measurement & perf. analysis
- ▶ Operating systems
- ▶ Programming languages
- ▶ Software engineering

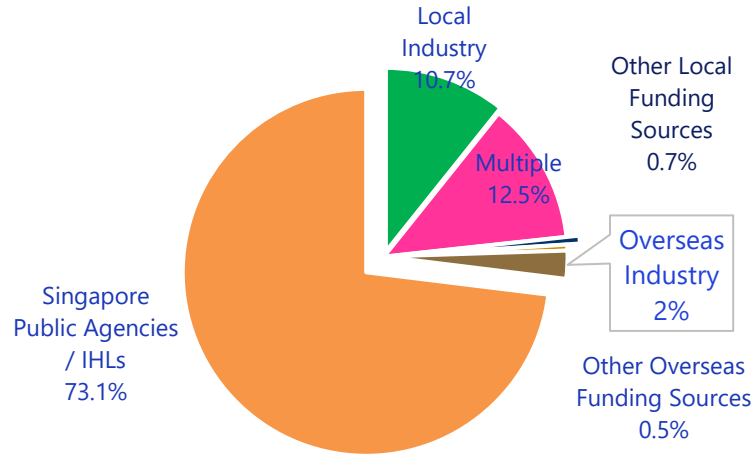
Theory

- ▶ Algorithms & complexity
- ▶ Cryptography
- ▶ Logic & verification

#	Institution	Count	Faculty
1	▶ Tsinghua University	19.7	126
2	▶ Peking University	15.6	127
3	▶ KAIST	11.3	84
4	▶ National University of Singapore	10.8	59
5	▶ Zhejiang University	9.7	93
6	▶ Shanghai Jiao Tong University	9.2	83
7	▶ HKUST	9.0	43
8	▶ Nanyang Technological University	8.9	55
9	▶ Chinese Academy of Sciences	8.2	69
10	▶ Singapore Management University	7.2	42
11	▶ Nanjing University	6.7	87
12	▶ Fudan University	6.4	63
13	▶ Chinese University of Hong Kong	6.3	37
14	▶ Seoul National University	5.9	41
15	▶ Renmin University of China	4.8	44
16	▶ Harbin Institute of Technology	4.2	83
17	▶ University of Tokyo	4.1	38
18	▶ USTC	4.0	29
19	▶ BUPT	3.9	58
20	▶ Beihang University	3.7	38

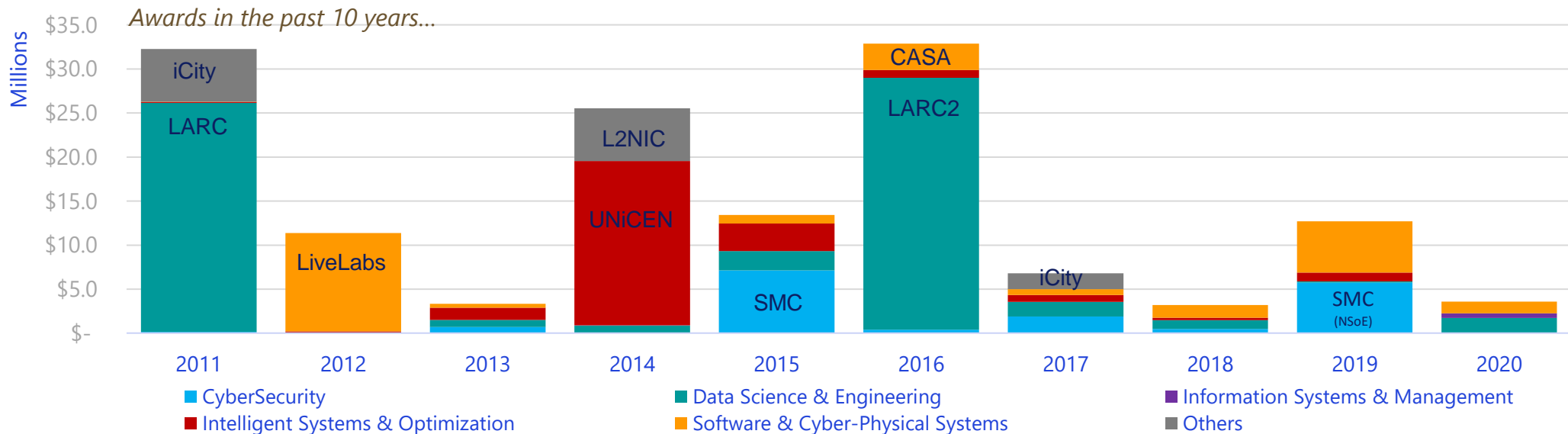
External Research Grants & Project Funding Awarded – By Calendar Year of Project Start Date

Key Funding Sources, Since 2003



Cumulative Amount Awarded to SCIS since 2003

\$151.48 million



Example Dissertations of our PhD graduates



WANG Shuohang (2014-15 Intake)
 Dissertation: Question answering with textual sequence matching
 Job placement: Researcher at Microsoft Redmond



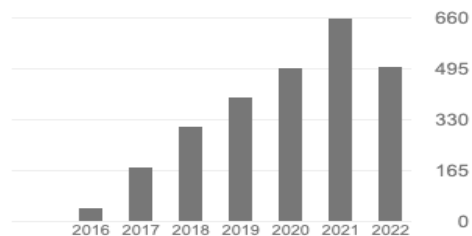
Shuohang Wang
 Senior Researcher, [Microsoft](#)
 Verified email at microsoft.com

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TITLE	CITED BY	YEAR
Machine Comprehension Using Match-LSTM and Answer Pointer S Wang, J Jiang International Conference on Learning Representations (ICLR 2017)	561	2017
Learning Natural Language Inference with LSTM S Wang, J Jiang The 15th Annual Conference of the North American Chapter of the Association ...	432	2016
R3: Reinforced Ranker-Reader for Open-Domain Question Answering S Wang, M Yu, X Guo, Z Wang, T Klinger, W Zhang, S Chang, G Tesauro, ... The 32nd AAAI Conference on Artificial Intelligence (AAAI)	301	2018
A Compare-Aggregate Model for Matching Text Sequences S Wang, J Jiang International Conference on Learning Representations (ICLR 2017)	268	2017
Evidence Aggregation for Answer Re-Ranking in Open-Domain Question Answering S Wang, M Yu, J Jiang, W Zhang, X Guo, S Chang, Z Wang, T Klinger, ... International Conference on Learning Representations (ICLR 2018)	163	2018
Hierarchical Graph Network for Multi-hop Question Answering Y Fang, S Sun, Z Gan, R Pillai, S Wang, J Liu arXiv preprint arXiv:1911.03631	105	2019
A Co-Matching Model for Multi-choice Reading Comprehension	84	2018

Cited by

	All	Since 2017
Citations	2602	2542
h-index	21	21
i10-index	32	32



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Co-authors

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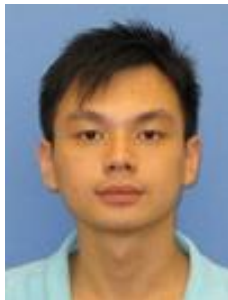
Example Dissertations of our PhD graduates



MA Siqi (2013-14 Intake)

Dissertation: Automatic Vulnerability Detection and Repair

Job placement: Senior Lecturer at The University of New South Wales, Australia



Roy LEE (2013-14 Intake)

Dissertation: Analyzing and Modeling Users in Multiple Online Social Platforms

Job placement: Assistant Professor at Singapore University of Science & Technology, Singapore

PhD Students' Development: Professional Skills Training

- Teaching Workshops and Experience
- Undertake the Graduate Instructor Foundations in Teaching (GIFT) Programme by SMU's Centre for Teaching Excellence
- Have hands-on teaching experience: Teaching Assistantships and Graduate Instructor positions at SMU
- English Communication Courses (including presentation skills)
- Scientific Writing Workshops
- Career Development Workshops (eg. resume writing, personal branding, networking skill, interviewing skills)



Employment Prospects

- **Academic institutions**, particularly software schools require PhD graduates with application/system building and management skills.
- **R&D units** require PhD graduates with system/business-view of technology, to complement graduates from other institutions who are trained to work on component technologies.
- **Industry** requires PhD graduates with the skill to develop tools and methodologies to translate business goals into technology requirements, and also to build technology-based solutions that contribute to revenue growth or cost reduction.

SCIS' PhD training will offer our graduates good employment prospects through a well-rounded education, and also opportunities to establish their network of contacts.

Employment Prospects

Job Placements		Examples	Percent.
R&D Labs/Centers		<p>Singapore: Salesforce, GRAB, AStar, DSO National Laboratories, IBM Singapore Lab, SAP, Twitter Singapore</p> <p>US: Microsoft/Microsoft Research, Amazon Research, EY, Baidu Research</p> <p>China: Alibaba, Huawei, Ant Financial, JD.com</p>	50%
Academy	Faculty	<p>Singapore: Singapore University of Technology and Design, National University of Singapore, Singapore University of Social Science</p> <p>Australia: Melbourne University, University of New South Wales</p> <p>Canada: Queen's University, University of Manitoba</p> <p>USA: University of Maryland Baltimore County, New Mexico State University</p> <p>Vietnam: RMIT Vietnam, VinUniversity, University of Engineering and Technology, Vietnam National University, Vietnam</p> <p>Hong Kong: The Chinese University of Hong Kong</p> <p>China: East China Normal University, Jinan University, Hunan University, Hubei University, Nanjing University of Science and Technology</p>	25%
	Post-Doc/ Research Fellow	<p>CMU, New York University, University of Luxemburg, University of Hanover Germany, Queen's University Canada, National University of Singapore, Dartmouth College</p>	21%

Admission Requirements

Passion

For the pursuit and creation of knowledge to benefit society.

At least a good Bachelor's degree

A Master's degree is useful but not required.

GMAT/GRE

SMU, NUS, SUTD and NTU students are exempted.

TOEFL/IELTS

For applicants whose medium of instruction at the undergraduate level was not English.

PhD Application Procedure

When to Apply?

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

How to Apply

Online application: <https://scis.smu.edu.sg/programmes/PhD/online-application>





Regarding...

PhD Programmes:
smu.sg/scis-phd

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