A/Prof (James) Xi Zheng

Australian Research Council Future Fellow, Director of the Intelligent Systems Engineering Research Group **http://itseg.org/,** Director of International Engagement, Associate Professor (US Full Professor) in Software Engineering at School of Computing Macquarie University (Sydney, Australia)

Email: james.zheng@mq.edu.au
Mobile: 0431044581 (Australia)
MQ Profile: https://researchers.mq.edu.au/en/persons/xi-zheng
Google Scholar: https://scholar.google.com/citations?user=SNfRGJoAAAAJ
Linkedin: https://www.linkedin.com/in/xi-zheng-614b6032/

PROFESSIONAL PROFILE

A/Prof. Xi Zheng is a distinguished leader in cyber-physical systems and AI trustworthiness, with substantial achievements in research, funding, and academic leadership. **In 2024, he was awarded the prestigious $960,412 ARC Future Fellowship for "Advancing Robust Autonomy in Cyber-Physical Systems," making him the only recipient in Software Engineering and one of seven in IT across Australia. This marks the first Future Fellowship in the history of Macquarie University's School of Computing.** A/Prof. Zheng has successfully secured over $2.4 million in competitive funding from the Australian Research Council (including 1 Future Fellowship, 2 Linkages, and 1 Discovery project) and Data61, with a focus on safety analysis, model testing, verification, and trustworthy AI for autonomous vehicles. He is currently leading a $537,041 ARC LP initiative on autonomous path planning for passenger aircraft in collaboration with MIT-based startup Savion and is also a Chief Investigator on major initiatives, such as a $35 million ARC Centre of Excellence bid and a $2.9 million project focused on enhancing rural driving safety.

His research has garnered over **5,902 citations with an H-index of 42, i10-index of 112** (14th Feb 2025), and he continues to push academic boundaries with his students' work gaining significant recognition, including recent acceptance for drone testing at the ACM International Conference on Software Engineering (ICSE'25), the first industry-scale extensive study on autonomous driving testing at the ACM International Conference on the Foundations of Software Engineering (FSE'22), and multiple best paper awards, including the recent best paper award at the 21st IEEE International Conference on Mobile Ad-Hoc and Smart Systems (MASS).

A/Prof. Zheng's leadership extends to serving as a General Chair in the bid to host the IEEE/ACM International Conference on Automated Software engineering (ASE) 2028 in Sydney, which, if successful, would be the first time this top software engineering conference is held in Sydney. He has also served on the Program Committees for leading conferences, such as ICSE (2026), CAV (2025), FSE (2022, 2024) and PerCom (2017-2025), and as PC Chair for IEEE CPSCom-2021 and IEEE Broadnets-2022. He is an associate editor for ACM Distributed Ledger Technologies and an editor for Springer's Journal of Reliable Intelligent Environments. In 2023, A/Prof. Zheng served as a visiting professor at both UCLA and UT Austin, and he co-founded the International Workshop on Trustworthy Autonomous Cyber-Physical Systems (TACPS.org), further contributing to his reputation as a global leader in the field. His numerous recognitions include the Deakin Industry Researcher Award (2016) and the MQ Early Career Researcher Award (Runner-up, 2020). A/Prof. Zheng is a leading co-organizer for the **Shonan Meeting (Seminar No. 235)** on *"LLM-Guided Synthesis, Verification, and Testing of Learning-Enabled CPS"* in March 2026 and the **Dagstuhl Seminar (202501048)** on *"Advancing Testability and Verifiability of CPS with Neurosymbolic and Large Language Models"* in October 2026.

EDUCATION HISTORY

2012.09 – 2015.09 Ph.D., Software Engineering, The University of Texas at Austin, Texas, USA.
Thesis: Physically Informed Runtime Verification for Cyber Physical Systems.

2004.02 – 2006.06 Master of Computer Science and Engineering, UNSW, Sydney, Australia.

1997.09 – 2001.09 Bachelor of Computing Information Science, Fudan University, Shanghai, PRC.

EMPLOYMENT HISTORY

2017.11 ~ Present
Director for Intelligent Systems Research Group, Director of International Engagement , Deputy Program Leader for Software Engineering at School of Computing, Associate Professor (equivalent to Full Professor USA) in Software Engineering, Macquarie University, Sydney, Australia.

Major Accomplishments:

- Co-founded the International Workshop on Trustworthy Autonomous Cyber-Physical Systems (TACPS https://www.tacps.org/) alongside world-renowned researchers in the domain, including Prof. Aloysius Mok (UT Austin), Prof. Insup Lee (UPenn), Prof. Oleg Sokolsky (UPenn), Prof. Bhaskar Krishnamachari (USC), Prof. Dakai Zhu (UT Dallas) and Prof. Ruzica Piskac (Yale). Our workshop program underscores verification and validation as central themes. These foundational aspects are critical throughout the Software Development Life Cycle (SDLC) of TACPS. From the stages of data collection and labeling, to the intricacies of AI-driven system design, development, testing, and deployment, the need for meticulous validation and verification is paramount.

- Founded the Intelligent Systems Engineering Research Group (https://itseg.org/) at Macquarie University and successfully secured over 2.4 million AUD in funding. This funding was garnered through four highly competitive Australian Research Council Projects (one Future Fellow, one Discovery and two Linkage projects), as well as two CSIRO/DATA61 CRP projects. All of these initiatives center on testing, security analysis, and verification of autonomous driving systems and Unmanned Aerial Vehicle (UAV) systems.

- Guided 7 PhD students to successful completion and supervised 1 Postdoctoral researcher. All have gone on to carve out significant roles as leading researchers in various industries and academic institutions. For instance, Dr. Tiehua Zhang is now with Ant Group in China, and Dr. Yong Li serves as a Senior Lecturer at Changchun University of Technology, China. In 2023, two of the PhD graduates A/Prof. Zheng supervised were recognized with the Vice Chancellor's commendation for thesis excellence.

- In 2020, A/Prof. Zheng received a high commendation for the Excellence in Early Career Research Award from the Faculty of Science and Engineering at Macquarie University.

2015.09 ~ 2017.11, Lecturer in Computer Science, (equivalent to Assistant Professor USA) Deakin University, Melbourne, Australia

Major Accomplishments:

- Developed and taught new undergraduate and postgraduate courses in Software Engineering and Internet of Things (IoT).

- Incorporated state-of-the-art and state-of-the-practice materials into postgraduate courses, and have trained postgraduate students in research methodologies to address real-world research challenges. These students have made significant contributions, as evidenced by their work winning the Best Paper award for Security Analysis of Modern Critical Android Mobile Applications at the Australasian Computing Doctoral Consortium in 2017, and Verification of Microservices Using Metamorphic Testing at the International Conference on Algorithms and Architectures for Parallel Processing in 2019.

- Honored with Industry Researcher award in Deakin 2016.

2005.11 ~ 2012.07, Solution Architect, Menulog Pty. Ltd., Sydney, Australia

Major Accomplishments:

- Designed and developed a scalable and robust distributed system architecture, multiple kernel middlewares and a runtime monitoring system behind Menulog, one of the biggest online food takeaway system in Australia (sold $855 million in 2015 https://tinyurl.com/39re6tj4).

PUBLICATIONS AND OTHER RESEARCH OUTPUTS (Updated on 27/Mar/2024, full publication list please check https://itseg.org/publications_stat.php)

A/Prof. Zheng has published over 100 refereed papers (more than 30 CORE A*) including:
**** over 80 refereed journal articles, (48 IEEE/ACM Transactions, 12 IoT Journal, 2 JPDC, 2 IEEE Systems Journal, 1 JSAC, 1 IEEE Commun. Surv. Tutor., 1 ACM Computing Survey)***
**** over 20 refereed conference and workshop papers (2 ICSE, 3 FSE, 1 ASE, 1 UbiCOMP, 2 PerCom, 3 ICSOC)***

Ten Career-Best Research Outputs

[1] Liang, L., Deng, Y., Morton, K., Kallinen, V., James, A., Seth, A., Kuantama, E., Mukhopadhyay, S., Han, R. and **Zheng, X**., 2025. RLaGA: A Reinforcement Learning Augmented Genetic Algorithm For Searching Real and Diverse Marker-Based Landing IEEE/ACM International Conference on Software Engineering (ICSE). **CORE A***

[2] **Zheng, X.**, Mok, A.K., Piskac, R., Lee, Y.J., Krishnamachari, B., Zhu, D., Sokolsky, O. and Lee, I., 2024, July. Testing learning-enabled cyber-physical systems with large-language models: A formal approach. The ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE). **CORE A***

[3] Shao, C., Li, G., Wu, J. and **Zheng, X**., 2024. Exploring Semantic Redundancy using Backdoor Triggers: A Complementary Insight into the Challenges Facing DNN-based Software Vulnerability Detection. *ACM Transactions on Software Engineering and Methodology*, *33*(4), pp.1-28. **CORE A***

[4] Zhang, T., Xu, R., Zhang, J., Liu, Y., Chen, X., Yin, J. and **Zheng, X**., 2024. DSHGT: Dual-Supervisors Heterogeneous Graph Transformer—A Pioneer Study of Using Heterogeneous Graph Learning for Detecting Software Vulnerabilities. *ACM Transactions on Software Engineering and Methodology*, *33*(8), pp.1-31. **CORE A***

[5] Deng, Y., Yao, J., Tu, Z., **Zheng, X.**, Zhang, M. and Zhang, T., 2023. Target: Automated scenario generation from traffic rules for testing autonomous vehicles. *IEEE Transactions on Software Engineering*. **CORE A***

[6] Deng, Y., **Zheng, X.**, Zhang, T., Liu, H., Lou, G., Kim, M. and Chen, T., 2023. A Declarative Metamorphic Testing Framework for Autonomous Driving. IEEE Transactions on Software Engineering. **CORE A***

[7] Lou, G., Deng, Y., **Zheng, X.**, Zhang, M. and Zhang, T., 2022. Testing of Autonomous Driving Systems: Where are we and where should we go? The ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE). **CORE A***

[8] Deng, Y., **Zheng, X.**, Zhang, M., Lou, G. and Zhang, T., 2022. Scenario-based Test Reduction and Prioritization for Multi-Module Autonomous Driving Systems. The ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE). **CORE A***

[9] Deng, Y., Zheng, X., Zhang, T., Liu, H., Lou, G., Kim, M. and Chen, T.Y., 2022. A declarative metamorphic testing framework for autonomous driving. *IEEE Transactions on Software Engineering*, *49*(4), pp.1964-1982. **CORE A***

[10] Lin, X., Wu, J., Li, J., **Zheng, X.** & Li, G., 2021. Friend-as-Learner: Socially-Driven Trustworthy and Efficient Wireless Federated Edge Learning. IEEE Transactions on Mobile Computing, pp. 1–14. **CORE A***

Research Projects

In the past 7 years, A/Prof Zheng initiated and have been successful as CI in obtaining over 12 competitive research grants

(~AU$2.4 million) that were supported by external and internal grants, which included support from ARC Future Fellow Program, ARC Discovery Program, ARC Linkage Program, Data61 CRP, Industry funding, and MQ ECR grant.

• 2024: "Advancing Robust Autonomy in Cyber-Physical Systems", CI, ARC Future Fellow grant FT240100269. Awarded $960,412. 2024-2028.

• 2023: “Vulnerability Detection in Complex Software Systems using Deep Learning Models and Software Testing ", Ant Group Research Project. Lead CI. Awarded $30,705.

• 2022: “Robust and Scalable Autonomous Landing for Drones", ARC Linkage Project grant LP210100337. CI.

Awarded $459,593.

• 2022: “Explainable AI for Complex Heterogeneous Systems", Australian Data61 Top Up Grant. Lead CI.

Awarded $33,805.

• 2021: “Context-aware verification and validation framework for autonomous driving”, ARC Discovery Project grant DP21010247. CI. Awarded $448,958.

• 2021: “A safety-preserving ecosystem for autonomous driving”, ARC Linkage Project grant LP190100676. Lead

CI. Awarded $341,853.

• 2020: “Trustworthy AI-Human Interaction in Cyber-Physical World”, Australian Data61 CRP Grant. Lead CI.

Awarded $130,440.

• 2019: “Dynamic Safety Analysis for Cyber-Physical Systems”, MQ New Staff Research Grant. Lead CI.

Awarded $18,000.

• 2017: “Smoking behaviour & context detection and automated recommender system”, Lead CI. Deakin Centre

for Cyber Security Research Equipment Grant. Awarded $10,000.

• 2017: “Customizable and Efficient Development and Deployment of Micro Service for Software as a Service”,

Deakin Faculty award of Travel Grant. Lead CI. Awarded $3,500.

• 2017: “Customizable and Efficient Development and Deployment of Micro Service for Software as a Service”,

Deakin Faculty award of Minor Equipment Scheme. Lead CI. Awarded $20,000.

• 2016: “Securing Modern Vehicle Systems”, Deakin CCSR SRC Equipment Fund. Lead CI. Awarded $5,100.

• 2016: “Securing Modern Vehicle Systems”, Deakin SSBE Industry Engagement Grant. Lead CI. Awarded

$10,000.

• 2016: “Securing Modern Vehicle Systems”, Deakin Distributed Systems and Security Research Cluster Grant.

Lead CI. Awarded $2,000.

• 2016: “Investigating How to Build a Reliable and Secure Software-as-a-Service (SaaS) Platform”, Industry

Research Grant. Lead CI. Awarded $120,000.

Awards and Certificates

• 2024: ‘Overmind: Fast and Scalable Decentralized Learning Simulation for Mobile Environments’ awarded Best Paper at International Conference on Mobile Ad-Hoc and Smart Systems.

• 2023: Vice Chancellor's Commendation for Thesis Excellence awarded to Two PhD Graduates in the research group at Macquarie University.

• 2020: Highly recommended for the Excellence in Early Career Research Award, Faculty of Science and Engineering,

at Macquarie University.

• 2020: PhD students-led research project ‘Embedded Intelligence – Intelligent Systems Incubator’ awarded most innovative project in the Alpha innovation contest.

• 2018-20: ‘A survey on security issues in services communication of Microservices-enabled fog applications’ awarded for the top 20 most read paper in Concurrency and Computation: Practice and Experience (2017-2018, 2018-2019, 2019-2020), a CORE A journal.

• 2018-20: Six papers recognized as Highly Cited Papers in 2018-2022.

• 2019: ‘Verification of Microservices Using Metamorphic Testing’ awarded Best Student Paper at International

Conference on Algorithms and Architectures for Parallel Processing.

• 2017: ‘Security Analysis of Modern Critical Android Mobile Applications’ awarded Best Paper at Australasian

Computing Doctoral Consortium.

• 2016: Awarded Industry Researcher in Deakin.

MEMBERSHIPS

IEEE Member
ACM Member

References

Upon Request