

James Xi Zheng

Nationality: Australian

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Key Skills

Cyber Physical Systems (CPS), Cloud Computing, Robotics and Automation, Runtime Verification, Real Time Systems, Pervasive computing, Software Engineering, Information Retrieval, Mobile software and Middleware Design, Object Oriented Design and Development, Data and Application Integration, Large /Real Time Database System Design and Management, Software/System Development and Administration, Data Modelling, Information Management, Web Development and Technology.

Education

- **Ph.D., Software Engineering, The University of Texas at Austin (GPA: 3.97/4)**
- **Master of Computer Science and Engineering, UNSW, Sydney Australia (GPA: 3.88/4)**
- **Bachelor of Computing Information Science, Fu Dan University, Shanghai PRC (Major: 80/100)**

Research Focus

Software Modelling, Formal Verification, Security analysis, and Systematic testing for Cyber Physical System, Cloud Computing, Robotics and Autonomous Systems, Real-Time Systems, and Hybrid Systems.

Academic Experience

1) 11/2017 ~

Macquarie University Australia

Position Held: Lecturer in Software Engineering

My main jobs include: design and teach various subjects in Software Engineering; lead a few interesting yet challenging industry based research projects in formal verification and security analysis for Cyber Physical Systems/Internet of Things/Robotics/Service computing applications (including Microservices based and Fog/Edge based); mentor HDR students (mainly PhDs) in these research areas; and provide/plan career development for students.

2) 01/2016 ~ 11/2017

Deakin University Australia (Burwood Campus)

Position Held: Lecturer in Computer Science

My main jobs include: design and teach various subjects in Computer Science including distributed systems, verification and validation, security analysis for Cyber Physical Systems and Internet of Things, robotics, and software engineering units; engage industrial and government for research projects in the area of Internet of Things, Cloud Computing, and Humanoid Robotics; mentor postgraduate students in these research areas for interesting yet challenging thesis; and provide/plan career development to students.

3) 09/2015 ~ 12/2015

Deakin University Australia (Burwood Campus)

Position Held: Research Fellow in Cyber Physical Systems

My main job is to create practical and project-oriented software engineering teaching units with specific focus on Cyber Physical Systems, lead a project for robocup soccer, collaborate on industrial research projects on securing car systems against various malicious attacks and in-depth forensic analysis of

behaviours in vehicle systems, and conduct research on various topics in Cyber Physical Systems, and Internet of Things in general.

4) **09/2013 ~ 08/2015 The University of Texas at Austin**
Position Held: Graduate Research Assistant, Mobile and Pervasive Computing Lab

My research focuses on the design and implementation of specification language, middleware, and real-time simulation for Cyber Physical Systems (CPS). I contributed an intuitive way to integrate Formal Methods (temporal logic and timed automata specifically), practical online monitoring tools and middleware (efficient and expressive), and real-time simulation into CPS runtime verification.

5) **01/2013 ~ 09/2013 The University of Texas at Austin**
Position Held: Graduate Teaching Assistant

Algorithm EE360C – Spring 2013, Summer 2013

IT Industry Certifications

- MCSD - Microsoft Certified Solution Developer
- MCSE – Microsoft Certified System Engineer
- MCDBA – Microsoft Certified Database Administrator
- MCP – Microsoft Certified Professional

Professional Experience

11/2005~ 07/2012 Menulog/Artog/MyRate, Sydney Australia
Position Held: Solution Architect

- 1) Architect and design majority of the Menulog Systems by applying the latest research results in RDBMS, SOA, message systems, software integration, runtime software verification, and static analysis. This architect is essential for this 855 million dollar worth online systems (<http://www.afr.com/technology/web/ecommerce/james-packerbacked-menulogs-855m-sale-part-of-international-land-grab-20150511-ggylwn>), which is the largest food ordering system in Australia
- 2) Co-establish the IT team In Menulog
- 3) Establish collaboration with technical partners across the world
- 3) Provide training for the IT team
- 4) Manage various IT projects with other key stakeholders using SCRUM

04/2004~ 11/2005 Glintech Consulting, Sydney Australia
Position Held: IT Consultant

- 1) Develop Web application and middleware in .Net, ASP, VB, MySQL, SQL Server, Oracle, Adobe IForm; 2) develop XML database using SQLXML; 3) created invoice generation engine using XSL-FO; 3) develop message queuing system using IBM MQ, Java

Grant Applications and Award

“Investigating How to Build a Reliable and Secure Software-as-a-Service (SaaS) Platform”, CI: Xi Zheng, Mohamed, Abdelrazek, and Wanlei Zhou, Industry Research Grant (awarded 120k AUD for the first stage), 2016

“Securing Modern Vehicle Systems”, CI: Xi Zheng, Lei Pan, Lynn Batten, Deakin Distributed Systems and Security Research Cluster, awarded 2k, 2016

“Securing Modern Vehicle Systems”, CI: Xi Zheng, Lei Pan, Lynn Batten, SSBE Industry Engagement Grant, awarded 10k, 2016

“Securing Modern Vehicle Systems”, CI: Xi Zheng, Lei Pan, Lynn Batten, CCSR SRC Equipment Fund, awarded 5.1K, 2016

“Customizable and Efficient Development and Deployment of Micro Service for Software as a Service”, CI: Xi Zheng and Wanlei Zhou, Deakin Faculty award of Minor Equipment Scheme, Awarded 20k, 2017

“Customizable and Efficient Development and Deployment of Micro Service for Software as a Service”, CI: Xi Zheng and Wanlei Zhou, Deakin Faculty award of Travel Grant, Awarded 3.5K, 2017

“Smoking behaviour & context detection and automated recommender system”, CI: Xi Zheng, Sutharshan Rajasegara, and Chandan Karmakar, Deakin Centre for Cyber Security Research Equipment Grant, Awarded 10K, 2017

Deakin Industry Engagement Award *for excellence in industry engagement leading to strategic partnerships or industry funding 2016*

Key Industry engagement research projects:

1. Investigating How to Build a Reliable and Secure Software-as-a-Service (SaaS) Platform (Secured 120K, this involved into a follow-up research project “Customizable and Efficient Development and Deployment of Micro Service for Software as a Service” with multi software companies overseas)

This project is to explore the state of the art practical approaches to tackle challenges in developing, configuring, deploying, and securing Software-as-a-Service applications using Micro Services.

2. Securing Modern Vehicle Systems (Now exploring research collaboration with department of automotive vehicle in Tsinghua and a few Automotive companies to secure modern vehicle systems)

The project investigates how to apply formal methods, software testing, network traffic analysis, machine learning algorithms, malware detection, and vulnerability detection to deal with challenges from multi layers inside modern vehicle systems.

3. Non Invasive Sensor Based Smoking/Drinking Intervention Systems (Now in a commercial prototype stage to attract industrial interest for future ARC Linkage application)

This project is to investigate using state of the sensors, feature extraction and engineering algorithms, machine learning algorithms, and micro service architecture to develop smart smoking/drinking intervention systems. This project is our first step into IoT health domain.

Selected Invited Talks

Nanjing University China, Visit Talk, “Physically Informed Runtime Verification for Cyber Physical Systems”, NanJing, China, March 2015

NICTA Australia, End of Visit Talk, “Physically Informed Runtime Verification for Cyber Physical Systems”, Sydney, Australia, May 2015

University of California, Los Angeles, Visit Talk. “Physically Informed Runtime Verification for Cyber Physical Systems”, Los Angeles, USA. June 2015

NanYang Technological University, Visit Talk. “Physically Informed Runtime Verification for Cyber Physical Systems”, Singapore. June 2015

Singapore Management University, Visit Talk. “Physically Informed Runtime Verification for Cyber Physical Systems”, Singapore. June 2015

Hong Kong Polytechnic University, Visit Talk. “Physically Informed Runtime Verification for Cyber Physical Systems”, Hong Kong. June 2015

Sun Yat-Sen University, Visit Talk. “Physically Informed Runtime Verification for Cyber Physical Systems”, Guang Zhou, China. June 2015

TianJing Univeristy, Visit Talk. “Research prospects in Service computing and IoT”, TianJing, China, Jan 2017

Sun Yat-Sen University, Visit Talk. "Research prospects in Service computing and IoT", Guangzhou, China, Jan 2017

Southern University of Science and Technology, Visit Talk. "Research prospects in Service computing and IoT", Shenzhen, China, Jan 2017

Anhui University, Visit Talk. "Research prospects in Service computing and IoT", Anhui, China, April 2017

Tsinghua University, Visit Talk. "Securing Modern Vehicle Systems", Beijing, China, Dec 2017

IDrivePlus Automotive Co., Visit Talk. "Safety Analysis for Vehicle Systems", Beijing China, Dec 2017

MMC Aired Technology, Visit Talk. "Reliability Analysis for IoT", ShenZhen China, Jan 2018

HuaQiao University, Visit Talk. "Research Prospect in IoT Security", XiaMen China, June 2018

Geely Automobile Research Institute, Visit Talk. "Securing Modern Vehicle Systems and Its way forward", Hangzhou China, June 2018

Teaching

Software Engineering (Undergraduate), Distributed Systems (Undergraduate), Operating Systems (Undergraduate), Fundamentals of Robotics (Undergraduate), Practical Projects (Postgraduate), Software Testing (Postgraduate), Fundamentals of Computer Science (Undergraduate), Data Structures and Algorithms (Undergraduate)

Selected Supervised Research Students (Major Thesis)

Peiyin Wang, MIT Professional Deakin, 2015 (thesis: survey of modern car systems)

Harish Radhappa, MIT Professional Deakin, 2016 (thesis: security analysis of sensor networks)

Huzefa Bootwala, MIT Professional Deakin, 2016 (thesis: security analysis of modern vehicle systems)

Gurjeet Bhatia, MIT Professional Deakin, 2016 (thesis: practical overview of human motion detection solutions)

Lovejit Gupta, MIT Professional Deakin, 2016 (thesis: Detecting Alcohol Drinking Behaviour Using non-intrusive mechanisms)

Akash Chhetri, MIT Professional Deakin, 2016 (thesis: Real-time recommendation system to intervene excessive use of Tobacco and Alcohol)

Veerpal Kaur Ramgarhia, MIT Professional Deakin, 2016 (thesis: Recommendation Systems on Health)

Babin Bhandari, MIT Professional Deakin, 2016 (thesis: A Non-Intrusive Way of Detecting Smoking Using Accelerometer)

Lakshmi Sirisha Revadi, MIT Professional Deakin, 2016 (thesis: Investigating Key User Experiencing Engineering Aspects in Software-as-a-Service Service Delivery Model)

Research-Related Administrative Work

- PC member of PerCOM 2017, 2018, 2019 <http://www.percom.org>
- PC member of MOBILESoft – New Idea Track 2017
- Technical Co-Chair of Cyber Physical Systems Track of CSS 2017
- Technical Co-Chair of ACDC 2017
- PC Co-Chair of International workshop on Emerging Computing Paradigms and Context in Business Process Management (BPM 2018)
- Publications Chair of Australasian Computer Science Week (ACSW 2019)
- Reviewer for prestigious journals including IEEE Systems Journal, ACM Transactions on Design Automation of Electronic Systems, Pervasive and Mobile Computing, IEEE Transaction on Cloud Computing, IEEE Internet of Things, Future Generation Computer Systems, Journal of Parallel and Distributed Computing

Publications

i. Refereed journal articles:

- Xianjiao Zeng, Guangquan Xu, X. Zheng, Yang Xiang, Wanlei Zhou, E-AUA: An Efficient Anonymous User Authentication Protocol for Mobile IoT, IEEE Internet of Things Journal, 2018 Q1 JIF: 7.633
- Haiming X, Guangyu T, Guangqian D, Yong Hu, Hongxu Ch, X. Zheng, Tom H. Luan (2018) A Hybrid Method Combining Markov Prediction and Fuzzy Classification For Driving Condition Recognition. IEEE Transactions on Vehicular Technology. JIF: 4.06. Q1
- T.L. Zheng, X. Zheng, Y.Q. Zhang, Yao Deng, Rui Zhang, L. Xiao (2018) SmartVM: a SLA-aware Microservice Deployment Framework. World Wide Web (WWW) Journal. JIF: 1.83. Q2 (CORE A)
- G.Q. Xu, Y. Zhang, A.K. Sangaiah, X.H. Li, A. Castiglione, X. Zheng (2018) CSP-E2: An abuse-free Contract Signing Protocol with low-storage TTP for energy-efficient electronic transactions ecosystems. Information Sciences. in-press. JIF: 4.81. Q1
- D.J. Yu, Yike Jin, Y.Q. Zhang, X. Zheng (2018) A Survey on Security Issues in Services Communication of Microservices. Concurrency and Computation: Practice and Experience. in-press. JIF: 1.22. CORE A
- X. Zheng, C. Julien, H.X. Chen, R. Podorozhny, f. Cassez (2017) Real-Time Simulation Support for Runtime Verification of Cyber-Physical Systems. ACM Transactions on Embedded Computing Systems (TECS) 16(4), p.106. JIF: 1.48. Q2 (CORE A)
- L. Pan, X. Zheng, P. Kolar, S. Bangay (2017) Object Localization through Clustering Unreliable Ultrasonic Range Sensors. International Journal of Sensor Networks pp.1-14.
- A. Anvari, L. Pan, X. Zheng (2017) Generating security questions for better protection of user privacy. International Journal of Computers and Applications pp.1-22.
- H. Radhappa, L. Pan, X. Zheng, W. Sheng (2017) Practical overview of security issues in wireless sensor network applications. International Journal of Computers and Applications pp.1-12.
- X. Zheng, M. Fu, Mohit Chugh (2017) Big data storage and management in SaaS applications. Journal of Communications and Information Networks 2(3) pp.18-29.
- L. Pan, X. Zheng, H.X. Chen, T. Luan, H. Bootwala, L. Batten (2017) Cyber Security Attacks to Modern Vehicular Systems. Journal of Information Security and Application 36, pp.90-100.
- X. Zheng, C. Julien, R. Podorozhny, F. Cassez, T. Rakotoarivelo (2016) Efficient and Scalable Runtime Monitoring for Cyber-Physical System. IEEE Systems Journal Volume: PP issue:99. JIF: 3.89. Q1.
- X. Zheng, C. Julien, M. Kim, S. Khurshid (2015) Perceptions on the State of the Art in Verification and Validation in Cyber Physical Systems. IEEE Systems Journal Volume: 11 Issue: 4. JIF: 3.89. Q1.

ii. Fully refereed conference proceedings

- M. Fu, C.M. Wong, H. Zhu, Y.J. Huang, Y.P. Li, X. Zheng, J. Wu, J. Yang, C.M. Vong, DALiM: Machine Learning Based Intelligent Lucky Money Determination for Large-Scale E-Commerce Businesses, International Conference on Service-Oriented Computing, 2018 CORE A
- D. Wang, S. Wen, Wanlei Z., X. Zheng (2018) Who Spread to Whom? Inferring Online Social Networks with User Features. IEEE International Conference on Communications, Kansas City, MO, USA. in-press. CORE B
- M.D. Liu, G.Q. Xu, J. Zhang, R. Shankaran, G. Luo, X. Zheng, Z.H. Zhang, Roundtable Gossip Algorithm: A Novel Sparse Trust Mining Method for Large-scale Recommendation Systems, ICA3PP 2018, CORE B
- X. Zheng, Jiao Jiao Jiang, Y.Q. Zhang, Yao Deng, Min Fu, TianLei Zheng, Liu Xiao (2017) SmartVM: A Multi-Layer Microservice-Based Platform for Deploying SaaS. International Symposium on Parallel and Distributed Processing with Applications (ISPA), Guangzhou, China. in-press. CORE B
- Y.Q. Zhang, M.S. Zhang, X. Zheng, D. E. Perry (2017) Service2vec: A Vector Representation for Web Services. International Conference on Web Services (ICWS) Honolulu pp. 890-893, Hawaii, USA. CORE A
- B. Bhandari, J.C. Lu, X. Zheng, S. Rajasegari, C. Karmakar (2017) Non-Invasive Sensor Based Automated Smoking Activity Detection. International Conference of the IEEE Engineering in Medicine and Biology Society pp. 845-848, Jeju, Korea. CORE C
- X. Zheng, A. Bansal, M. Lease (2017) Bullseye: Structured Passage Retrieval and Document Highlighting for Scholarly Search, Proc. of Asia-Pacific Conference on Conceptual Modelling p.32, Geelong, Australia, 2017.
- V. Pham, X. Liu, X. Zheng, M. Fu, S. Deshpande, W.D. Xia, M. Abdelrazek (2017) PaaS - Black or White: An Investigation into Software Development Model for Building Retail Industry SaaS. Proc. of International Conference on Software Engineering Companion (ICSE-C), In Conjunction with ICSE (CORE A*), Buenos Aires, Argentina.
- A. B. Abkenar, S. W. Loke, X. Zheng, A. Zaslavsky (2017) Service-Mediated On-Road Situation-Awareness for Group Activity Safety. International Workshop on Next Generation Computing (NGCom), In Conjunction with MobiQuitous (CORE A), Melbourne, Australia.
- T.L. Zheng, Y.Q. Zhang, X. Zheng, M. Fu, L. Xiao, L.M. Zhu (2017) BigVM: A Multi-Layer-Microservice-Based Platform for Deploying SaaS. International Conference on Advanced Cloud and Big Data (CBD) pp. 45-50. Shanghai, China.
- X. Zheng, L. Pan, H.X. Chen, R. D. Pietro, L. Batten (2017) A Testbed for Security Analysis of Modern Vehicle Systems. International Symposium on Security, Privacy and Trust in Internet of Things, In Conjunction with TrustCom (CORE A), pp. 1090-1095, Sydney, Australia.
- X. Zheng, L. Pan, E. Yilmaz (2017) Security Analysis of Modern Mission Critical Android Mobile Applications. Proc. of Australasian Computing Doctoral Consortium p.2, Geelong, Australia. Best paper award
- X. Zheng, L. Pan, H.X., Chen, P.Y. Wang, L. Batten (2016) Investigating security vulnerabilities in modern vehicle systems. Proc. of International Conference on Applications and Techniques in Information Security pp. 29-40, Cairns, Australia.
- X. Zheng, C. Julien (2015) Verification and Validation in Cyber Physical Systems: Research Challenges and Our Solution. Proc. of International Workshop on Software Engineering for Smart Cyber-Physical Systems (SEsCPS), In Conjunction with ICSE (CORE A*), pp. 15-18, Florence, Italy.

- X. Zheng, C. Julien, R. Podorozhny, F. Cassez (2015) BraceAssertion: Runtime Verification of Cyber-Physical Systems. Proc. of International Conference on Mobile Ad-hoc and Sensor Systems (MASS) pp. 298-306, Berlin, Germany. **CORE B**
- X. Zheng (2014) Physically Informed Assertions for Cyber Physical Systems Development and Debugging. International Conference on Pervasive Computing and Communications Workshops, In Conjunction with PerCOM (**CORE A***), pp. 181-183, Budapest, Hungary.
- **X. Zheng**, D. Perry, C. Julien, (2014) BraceForce: Software Engineering Support for Sensing in CPS Applications, Proc. of International Conference on Cyber-Physical Systems (ICCPS) – WiP Track pp. 228, Berlin, Germany.
- **X. Zheng**, D. Perry, C. Julien (2014) BraceForce: a middleware to enable sensing integration in mobile applications for novice. Proc. of International Conference on Mobile Software Engineering and Systems (MobileSoft) pp. 8-17, In Conjunction with ICSE (**CORE A***), Hyderabad, India.

iii. Other publication outputs:

- **X. Zheng**, C.L. Fok, C. Julien, S. Khurshid, M. Kim (2014) On the state of the art in verification and validation in cyber physical systems. The University of Texas at Austin, The Center for Advanced Research in Software Engineering, Tech. Rep. TR-ARiSE-2014-001, 1485.
- **X. Zheng**, C. Julien, R. Podorozhny, F. Cassez (2014) Braceassertion: Behavior-driven development for cps application. Tech. Report TR-ARiSE-2014-008.
- **X. Zheng**, D.E. Perry, C. Julien (2013) Braceforce: A middleware enabling novice programmers to integrate sensing in cps applications. Tech. Report TR-ARiSE-2013-003, University of Texas at Austin.
- **X. Zheng**, C.L. Fok, C. Julien, S. Khurshid, M. Kim (2013) Brace: Assertion-driven development of cyber-physical systems applications. Tech. Report TR-ARiSE-2013-001, University of Texas at Austin.