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Highlights:

Solid knowledge in prognostics and health management (PHM), reliability and safety.
Rich leadership experiences in student activities and organizations.

Education:

University of Cincinnati Cincinnati, United States 08/2016 – present

- Ph.D. Candidate in Mechanical Engineering, School of Mechanical and Material Engineering
- Focus Areas: Industrial Big Data, PHM
- Courses: Introduction to Industrial Big Data Analytics and Applications, Machine Learning, Applied Statistics I, Applied Statistics II, Applied Fast Fourier Transforms

Beihang University (BUAA) Beijing, China 09/2013 – 01/2016

- Master of Engineering in Control Science and Engineering, School of Reliability and Systems Engineering (RSE)
- Focus Areas: System Safety

Beihang University Beijing, China 09/2009 – 07/2013

- Bachelor of Engineering in Quality and Reliability Engineering, School of RSE

Current Research Experiences at IMS Center:

HIWIN Corporation 11/2016 – present

- Wrote a literature survey about rehabilitation machine and gait analysis.
- Wrote the design of experiments (factorial design, ANOVA), IRB application and a part of NSF application for the development of a cyber assistant for a robotic gait training system.

Shanghai Electric Corporation 2/2016 - present

- Constructed wind power prediction algorithms in Python based on Matlab models.
- Wrote the report for parameter selections of the relevant algorithms.

Review for Cyber-Physical System (CPS) 07/2016 - 08/2016

- Wrote the survey report about key elements, enabling technologies, application fields, representative demonstrations, challenges and future trend for CPS.

Previous Experiences:

Mishap Mechanisms in Complex Systems and Rehearsal Methods Based on Functional Resonance Analysis Method (FRAM) 07/2013 – 01/2016

The National Natural Science Foundation of China Program

Research Assistant, Advisor: Prof. Jin Tian

- Used formal methods to describe couplings of functional variability, and then applied model checking to analyze hazards, hazardous scenarios and the resonance of complex socio-technical systems.
- Applied finite state machine (FSM) to respectively describe functions, variability of

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functions and couplings of variability, and then used model checking to automatically identify hazards and hazardous scenarios, and to exhibit resonance of systems.

- Self-learned formal methods, investigated about tens of model checking techniques, mastered 3 tools (NuSMV, PAT, SPIN), and found SPIN can satisfy our requirements.
- As the pioneer in the lab, investigated the present situation of Model-Based Safety Assessment (MBSA), discussed about a strategy to formally express FRAM.
- Translated chapter 3 & 9 (about 13000 words) of the book *FRAM: the Functional Resonance Analysis Method Modeling Complex Socio-technical Systems* to Chinese, examined about 46000 words and corrected tens of translation errors of technical terms.

Accident Investigation Method Based on Systems-Theoretic Accident Model and Processes (STAMP)

Research Assistant, Advisor: Prof. Jin Tian 03/2014 – 04/2014 02/2015

- On the basis of the investigation of MBSA, put forward a formal approach to extend Causal Analysis based on STAMP (CAST) with NuSMV. It exhibited accident causation traces and some possible factors, which were not included in the official report.
- Investigated the present situation of STAMP and reanalyzed Black Hawk Friendly Fire Accident by CAST.

Functional Hazard Analysis for Helicopter Flight Control System 04/2013 – 06/2013

Research Assistant, Advisor: Prof. Jiao Jian

- Mastered Safety Assessment Methods in SAE ARP4761, including Functional Hazard Analysis, Fault Tree Analysis, Failure Mode and Effects Analysis.
- Analyzed 35 functions and identified 186 hazards of the Flight Control System and their possible effects.

Reliability Research on Shanghai Mitsubishi Elevator 11/2014

Research Assistant, Advisor: Prof. Jin Tian

- Collected the information about Analytic Hierarchy Process (AHP), Quality Function Deployment (QFD), TOPSIS, Fuzzy Comprehensive Evaluation and prepared for the decision analysis research.

Publications:

- Yang, Q., Tian, J., and Zhao, T. (2017). *Safety Is An Emergent Property: Illustrating Functional Resonance in Air Traffic Management with Formal Verification*. *Safety Science*. (SCI)
- Tian, J., Wu, J., Yang, Q., and Zhao, T. (2016). FRAMA: A Safety Assessment Approach Based on Functional Resonance Analysis Method. *Safety Science*. (SCI)
- Yang, Q., and Tian, J. (2015). Model-Based Safety Assessment using FRAM for complex systems. *Proceedings of the 25th Annual European Safety and Reliability Conference*, Zurich, Switzerland. (EI, 20160902010416)
- Yang, Q., and Tian, J. (2015). A Formal Approach to Causal Analysis based on STAMP (CAST). *Proceedings of the 1st International Conference on Reliability Systems Engineering*, Beijing, China. (EI)
- Hollnagel, E. (Author), Tian, J., Wu, J., Yang, Q., and Gao, J. (2015). *FRAM: the Functional Resonance Analysis Method Modeling Complex Socio-technical Systems*. Beijing: National Defense Industry Press. (The 3rd Translator)



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Seminars and Conferences:

- The 25th annual European Safety and Reliability Conference, Zurich, Switzerland, 2015.
- The 1st International Conference on Reliability Systems Engineering, Beijing China, 2015.

Extracurricular Activities:

Member, 18th Graduate Student Council of BUAA 11/2014 – 11/2015

19 members, the high authority of Graduate Student Union of BUAA

- Deliberated and adopted important decisions of the Graduate Student Union, debriefed the regular reports of the presidium, appointed and dismissed the presidium members.

Vice President, Graduate Student Union of School of RSE, BUAA 12/2013 – 12/2014

- Led Recreation and Sports Department and Publicity Department and organized about 22 activities.
- Took charge in 5 major activities of School of RSE, such as welcome party and singing competition, which generally last about 3 hours and over 160 persons participated in, including about 3 heads of school.
- Directed teams of school take part in university competition, responsible for design originality and making presentations and totally won 3 team awards.

Volunteer, FLTRP Regional Debate Training Courses 09/2011 – 10/2011

Organized by China English Language Education Association and Foreign Language Teaching and Research Press

- Managed daily operation and finance of the training of over 70 persons and won the excellent volunteer award.

Member, Committee of Class 39141, Class 3914 & Class SY13142, School of RSE, BUAA

09/2009 – 08/2010, 09/2010 – 08/2011, 09/2013 – 01/2016

- Won the 2014-2015 1st Prize of Outstanding Graduate Class of BUAA (10%)

Honor and Awards:

- 2016 Excellent Graduate of BUAA (28/157)
- 2015 Outstanding Student Cadre of Graduate President Scholarship of BUAA (2/157)
- 2014 Outstanding Graduate Student of BUAA (15/157)
- 2013-2014 Outstanding League Member of BUAA

Special Skills:

- IT skills: Python, Matlab, LabVIEW, SAS, R, MTConnect, Minitab, AutoCAD, CAXA, LaTeX, NuSMV, SPIN, PAT, Linux (Ubuntu, Fedora), Photoshop, Corel VideoStudio
- Languages: Chinese (native), English (proficient), German (A II)
- Interests: Badminton, Guitar, Singing (The 2nd Prize of the 2nd Singers Competition of School of RSE, BUAA), Photography, Chinese calligraphy