

# Koosha Marashi

SOFTWARE/FIRMWARE ENGINEER · FULL-STACK DEVELOPER

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## Education

### Missouri University of Science and Technology (Missouri S&T)

Rolla, MO

PH.D. IN COMPUTER ENGINEERING

Aug. 2012 – July 2017

- **Dissertation:** Quantitative Dependability and Interdependency Models for Cyber-Physical Systems
- **Advisor:** Dr. Sahra Sedigh Sarvestani
- **GPA:** 3.83/4.0

### Isfahan University of Technology (IUT)

Isfahan, Iran

B.S. IN ELECTRICAL ENGINEERING

Sep. 2006 – Feb. 2011

- **GPA:** 15.61/20

## Work Experience

### Missouri S&T, Department of Electrical and Computer Engineering

Rolla, MO

GRADUATE RESEARCH ASSISTANT

Aug. 2012 – Present

- Developed reliability and interdependency models for smart grids. These analytical models help in identifying vulnerabilities and reducing service interruptions in modern electrical grid.
- Made an ultra-low-power VLF signal detector for underwater communications extending battery life of transceivers by a factor of 40.

### Kalscott Eng.

Lawrence, KS

SOFTWARE/HARDWARE DEVELOPMENT INTERN

May 2016 – Aug. 2016

- Reduced power consumption of a navigation system for UAVs to one thirtieth of its original value and increasing its performance by 40% by migrating the system to a Linux-powered single-board computer and utilizing optimized algorithms.

### Intellispeak LLC

Lawrence, KS

FULL-STACK DEVELOPMENT INTERN AND CO-OP

May 2015 – May 2016

- Utilized Bluetooth beacons and constructed an information network to help patients with Autism.
- Was responsible for development of server back-end, Android app, database, and web interface.

### Kalscott Eng.

Lawrence, KS

SOFTWARE/HARDWARE DEVELOPMENT INTERN

May 2014 – Aug. 2014

- Developed an automated air-band radio for UAVs. This system is able to predict intent of UAVs with 98% accuracy and inform nearby traffic.

### Beh-Azmoon

Isfahan, Iran

FIRMWARE ENGINEER

Dec. 2011 – Jun. 2012

- Created a wireless digital crack monitoring system for structural health monitoring. This system will replace the traditional crack gauges and eliminates the need for constant surveillance.

### IUT, Department of Electrical and Computer Engineering

Isfahan, Iran

RESEARCH ASSISTANT

Feb. 2006 – Nov. 2011

- Made a multi-functional stand-alone data logger.
- Developed navigation system and sensor fusion algorithm for LynCean mobile robot.
- Made a controller board for Parsa humanoid robot.
- Prototyped an AUTOSAR-compliant engine control unit for Honda GX35 engine.

## Leadership Activities

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### Eta Kappa Nu Honor Society - Gamma Theta Chapter

Rolla, MO

ACTIVE MEMBER

Mar. 2014 – Present

- Attended regular meetings and helped in voluntary services.

### Super-mileage Car Student Design Team

Isfahan, Iran

HARDWARE DEVELOPMENT LEADER

Oct. 2009 – Aug. 2010

- Communicated status and issues to cross-functional teams and senior manager.
- Coordinated resources using Microsoft Project.

### NODET Rescue Robot Student Design Team

Isfahan, Iran

TEAM LEADER

Sep. 2008 – Apr. 2009

- Mentored students, helping them to solve problems and make decisions.

## Honors and Awards

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|------|---|---------------------|
| 2013 | <b>National University Transportation Center Fellowship</b> , US Department of Transportation | Rolla, MO           |
| 2013 | <b>Travel Scholarship</b> , Trustworthy Cyber Infrastructure for the Power Grid               | Urbana, IL          |
| 2012 | <b>Vice-Provost for Graduate Studies Fellowship</b> , Missouri S&T                            | Rolla, MO           |
| 2010 | <b>Gold Medal</b> , 38 <sup>th</sup> Geneva Invention Exhibition                              | Geneva, Switzerland |
| 2010 | <b>Best Invention Award</b> , Russian Incubator of Inventions                                 | Geneva, Switzerland |
| 2009 | <b>Outstanding Undergraduate Researcher Award</b> , IUT                                       | Isfahan, Iran       |

## Publications

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### JOURNAL PAPERS

- **K. Marashi**, S. Sedigh, and A. Hurson, "Identification of Interdependencies and Prediction of Fault Propagation for Cyber-Physical Systems," *Reliability Engineering & System Safety*, submitted.
- M. Woodard, **K. Marashi**, and S. Sedigh, "Survivability Evaluation and Importance Analysis for Complex Networked Systems," *IEEE Transactions on Network Science and Engineering*, submitted.
- N. Jarus, M. Woodard, **K. Marashi**, A. Faza, J. Lin, P. Maheshwari, and S. Sedigh, "Survey on Modeling and Design of Cyber-Physical Systems," *ACM Transactions on Cyber-Physical Systems*, submitted.
- **K. Marashi**, S. Sedigh, and A. Hurson, "Consideration of Cyber-Physical Interdependencies in Reliability Modeling of Smart Grids," *IEEE Transactions on Sustainable Computing*, under review.
- **K. Marashi**, M. Woodard, S. Sedigh, and A. Hurson, "Quantitative Reliability Analysis for Intelligent Water Distribution Networks," *Transactions of the American Nuclear Society*, 2014.

### CONFERENCE AND WORKSHOP PAPERS

- **K. Marashi**, S. Sedigh, and A. Hurson, "Quantification and Analysis of Interdependency in Cyber-Physical Systems," *In Proceedings of the 3<sup>rd</sup> International Workshop on Reliability and Security Aspects for Critical Infrastructure Protection (ReSA4CI '16)*, Toulouse, France, Jun. 2016.
- **K. Marashi** and S. Sedigh, "Towards Comprehensive Modeling of Reliability for Smart Grids: Requirements and Challenges," *In Proceedings of the 15<sup>th</sup> IEEE International Symposium on High-Assurance Systems Engineering (HASE)*, pp. 105-112, Miami, FL, Jan. 2014. Selected for appearing in 2<sup>nd</sup> issue of 2015 Science of Security Newsletter.
- **K. Marashi**, M. Woodard, S. Sedigh, and A. Hurson, "Quantitative Reliability Analysis for Intelligent Water Distribution Networks," *In Proceedings of the Embedded Topical Meeting on Risk Management for Complex Socio-Technical Systems*, Washington, D.C., Nov. 2013.

## Patents

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| 2014 | <b>Wireless Temperature Monitoring System for Centrifugal Casting</b> , Pat. No. 81750 | <i>Iran</i> |
| 2010 | <b>2D Wireless Structural Crack Monitoring System</b> , Pat. No. 62181                 | <i>Iran</i> |
| 2010 | <b>Handheld Data Logger for Agricultural Applications</b> , Pat. No. 61142             | <i>Iran</i> |
| 2009 | <b>Life Detector Robot with Adjustable Functionality</b> , Pat. No. 60845              | <i>Iran</i> |
| 2009 | <b>Extendable DC Motor Controller System</b> , Pat. No. 60839                          | <i>Iran</i> |
| 2009 | <b>An Innovative Co-Axial Rotation Mechanism</b> , Pat. No. 60847                      | <i>Iran</i> |
| 2009 | <b>Robust Track Mechanism for Locomotion of Mobile Robots</b> , Pat. No. 60849         | <i>Iran</i> |
| 2009 | <b>Lightweight Robust Platform for Mobile Robots</b> , Pat. No. 60848                  | <i>Iran</i> |

## Professional Activities

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| 2016 | <b>Reviewer</b> , Journal of Mathematics and Computer Science                                |
| 2016 | <b>Reviewer</b> , IEEE International Computers, Software & Applications Conference (COMPSAC) |
| 2015 | <b>Reviewer</b> , IEEE International Computers, Software & Applications Conference (COMPSAC) |
| 2014 | <b>Reviewer</b> , IEEE International Green Computing Conference (IGCC)                       |
| 2014 | <b>Reviewer</b> , IEEE International Symposium on High Assurance Systems Engineering (HASE)  |
| 2014 | <b>Reviewer</b> , IEEE International Conference on Software Security and Reliability (SERE)  |
| 2013 | <b>Reviewer</b> , IEEE International Conference on Software Security and Reliability (SERE)  |

## Professional Development

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| 2017 | <b>Student Leadership Conference</b> , Missouri S&T  | <i>Rolla, MO</i>          |
| 2014 | <b>Graduate Teaching Assistant Workshop</b> , Missouri S&T   | <i>Rolla, MO</i>          |
| 2014 | <b>Research &amp; Technology Development Conference</b> , Missouri S&T   | <i>Rolla, MO</i>          |
| 2014 | <b>Transportation Infrastructure Conference</b> , Missouri S&T   | <i>Rolla, MO</i>          |
| 2014 | <b>IEEE/Ameren Lean Fundamentals Workshop</b> , Ameren   | <i>St. Louis, MO</i>      |
| 2014 | <b>Presenting Data and Information by Edward Tufte</b> , Fairmont Chicago  | <i>Chicago, IL</i>        |
| 2013 | <b>IEEE Seminar on Modeling Cyber Attack-Defense Interactions</b> , Missouri S&T   | <i>Rolla, MO</i>          |
| 2013 | <b>Engineering Management &amp; Systems Engineering Seminar on Applications and Future Directions of Computational Intelligence</b> , Missouri S&T | <i>Rolla, MO</i>          |
| 2013 | <b>Transportation Infrastructure Conference</b> , Capitol Plaza Hotel  | <i>Jefferson City, MO</i> |
| 2013 | <b>Trustworthy Cyber Infrastructure for the Power Grid (TCIPG) Summer School</b> , Q Center  | <i>St. Charles, IL</i>    |

## Professional Society Membership

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|------------|--|
| Since 2015 | <b>Student Member</b> , National Society of Professional Engineers |
| Since 2015 | <b>Member</b> , ACM - SIGMETRICS                                   |
| Since 2015 | <b>Student Member</b> , ACM  |
| Since 2014 | <b>Member</b> , IEEE - Eta Kappa Nu                                |
| Since 2013 | <b>Student Member</b> , IEEE                                       |

## Technical Skills

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|--------------------------------|--|
| <b>Programming Languages</b>   | Python, C/C++, Java, SQL, Verilog  |
| <b>Web Technologies</b>        | HTML, JavaScript, CSS, Jekyll, Amazon AWS/EC2  |
| <b>Computer Software</b>       | MATLAB & Simulink, LabVIEW (CLAD certificate, issued 5/13), OrCAD, $\LaTeX$ , SAS, JMP |
| <b>Programmable Devices</b>    | AVR and ARM-based Microcontrollers, FPGA   |
| <b>Communication Protocols</b> | TCP/IP, 802.03, 802.11, UART, SPI, I <sup>2</sup> C, ZigBee, Bluetooth                 |
| <b>Operating Systems</b>       | Windows, Linux (Ubuntu, Raspbian), Android   |
| <b>Miscellaneous</b>           | Git, Digital and analog circuit design, PCB design, Android application development    |