

# Koosha Marashi

SOFTWARE/FIRMWARE ENGINEER · BACK-END/WEB/EMBEDDED SYSTEMS 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:** 3.8/4.0

### Isfahan University of Technology (IUT)

Isfahan, Iran

B.S. IN ELECTRICAL ENGINEERING

Sep. 2006 – Feb. 2011

- **GPA:** 15.61/20.00

## 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/FIRMWARE DEVELOPMENT INTERN

May 2016 – Aug. 2016

- Reduced power consumption of a UAV navigation system to one thirtieth of its original value and improved its performance by 40% by migrating 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.
- Responsible for development of server back-end (Python), Android app (Java), database (MySQL), and web interface (HTML, JavaScript, and CSS).

### Kalscott Eng.

Lawrence, KS

SOFTWARE/FIRMWARE 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 is to replace the traditional crack gauges eliminating 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.

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

## Professional Activities

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- 2017 **Reviewer**, Springer Journal of Computing
- 2016 **Reviewer**, Journal of Mathematics and Computer Science
- 2016 **Reviewer**, IEEE International Computers, Software & Applications Conference (COMPSAC)
- 2015 **Reviewer**, IEEE International Computers, Software & Applications Conference (COMPSAC)
- 2014 **Reviewer**, IEEE International Green Computing Conference (IGCC)
- 2014 **Reviewer**, IEEE International Symposium on High Assurance Systems Engineering (HASE)
- 2014 **Reviewer**, IEEE International Conference on Software Security and Reliability (SERE)
- 2013 **Reviewer**, IEEE International Conference on Software Security and Reliability (SERE)

## Professional Development

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

## Professional Society Membership

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- Since 2015 **Student Member**, National Society of Professional Engineers
- Since 2015 **Member**, ACM - SIGMETRICS
- Since 2015 **Student Member**, ACM
- Since 2014 **Member**, IEEE - Eta Kappa Nu
- Since 2013 **Student Member**, IEEE

## Technical Skills

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<b>Programming Languages</b>	Python (expert), C/C++ (proficient), SQL (proficient), Java (prior experience), Verilog (prior experience)
<b>Web Technologies</b>	HTML, JavaScript, CSS, Bottle, RESTful API, Jekyll, Amazon AWS/EC2
<b>Computer Software</b>	MATLAB & Simulink, LabVIEW (CLAD certificate, issued 5/13), OrCAD, LaTeX
<b>Data Analysis</b>	Machine learning, Neural networks, Statistical modeling, Regression, ANOVA, TensorFlow, 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, Red Hat, Raspbian), Android
<b>Miscellaneous</b>	Agile development, Git, Jira, Digital and analog circuit design, PCB design, Android app development