

Mohammadreza Mousaei

RESEARCH ASSOCIATE · FIELD ROBOTICS CENTER, CARNEGIE MELLON UNIVERSITY

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Research Experience

Carnegie Mellon University

Pittsburgh, PA

RESEARCH ASSOCIATE AT FIELD ROBOTICS CENTER, ADVISOR: PROF. RED WHITTAKER.

Dec. 2017 - present

- **Developing Software for Pipe Crawler robot**
 - Developing 3D Perception software for pipe crawler robot using ToF Lidar
 - Developing online robot localization software using EKF
 - Developing post processing robot localization software using Factograph optimization (with GTSAM package)
 - Constructing 3D map of the environment using ICP
 - Developing robot simulation environment using Gazebo
 - Developing and tuning steering software using PID controller
- **Developing Software/Hardware for Moon Rover Robot**
 - Developing partial Hardware of a custom built light weighted Lidar
 - Developing Software for our custom built Lidar to construct a 3D point cloud

University of Illinois at Chicago

Chicago, IL

RESEARCH ASSISTANT AT WIRELESS LAB, ADVISOR: DR. SMIDA.

Aug. 2015 - Nov. 2017

- **Designing a fully integrated radar and communication platform**
 - Proposing the novel idea of integrating radar and communication functionality using custom designed pilot symbols
 - Formulating and solving the optimization problem using convex optimization methods to design pilot signals
 - This work is published at IEEE Military Communications Conference 2017 (IEEE Milcom 2017)
- **Optimizing Pilot Overhead for Ultra-Reliable Short-Packet Communication**
 - Formulating fading channel estimation properties for short packet communication
 - Formulating and solving the optimization problem for pilot-assisted finite-length packet transmission
 - This work is published at International Conference on Communication (IEEE ICC 2017)

Sharif University Of Technology

Tehran, Iran

RESEARCH ASSISTANT AT COMPUTER VISION LAB, ADVISOR: DR. JAMZAD.

Nov. 2014 - Feb. 2015

- **Developing Software/Hardware for an at-Home robot**
 - Mechanical Design of the robot platform (Differential Drive Robot with 4DOF Lynx Arm)
 - Controlling the 4DOF arm using inverse kinematic (analytical approach)
 - Developing software for motion planning (using artificial potential field)
 - Our robot could achieve 2nd rank in AUTCUP International Robotics Competition (AI League)

Tehran Polytechnic University

Tehran, Iran

RESEARCH ASSISTANT AT COMPUTER VISION LAB, ADVISOR: DR. SHIRI.

Jan. 2015 - Jul. 2015

- **Developing Hardware/Software of an at-Home Robot for ROBOCUP15**
 - Designing a digital circuit for gathering sensor data (Ultrasonic, IR, IMU, ...) over I2C BUS
 - Developing Software for ellipse detection using hough transform method (with OpenCV and Kinect)

Shahid Beheshti University

Tehran, Iran

RESEARCH ASSISTANT AT TELECOMMUNICATIONS LAB, ADVISOR: PROF. AFJEI.

Sep. 2013 - Dec. 2013

- **Research on optimizing Power Line Communication Systems with OFDM Modulation**

Publications

- **M. Mousaei**, M. Soltanalian, B. Smida, "ComSens: Exploiting Pilot Diversity for Pervasive Integration of Communication and Sensing", **IEEE International Conference on Communication**, May 2017, *Submitted*.
- **M. Mousaei**, B. Smida, "Optimizing Pilot Overhead for Ultra-Reliable Short-Packet Transmission", *IEEE International Conference on Communication*, May 2017.
- A. Sheikhsafari, S. Gharghabi, K. Sartipi, **M. Mousaei**, A. Sheikhsafari, E. Babaian and S. Shiry Ghidary, "Amirkabir University of Technology (AUT) @Home 2014 Team Description Paper", **Robocup 2014, Joao Pessoa, Brazil**, Jul. 2014.
- A. Keipour, K. Sartipi, **M. Mousaei**, S. Mohammadzadeh, M. Jamzad, "Team Description Paper for Sharif University of Technology (SUT) Team", **AUTCUP Robotics competitions**, Oct. 2013.
- **M. Mousaei**, A. Keipour, E. Babaian, "Automated High-Speed Traffic Monitoring and Violation Detection Using RFID Technology", **IEEE Iranian Conference on Electrical Engineerin**, May 2014.

Education

University of Illinois at Chicago

M.Sc. IN ELECTRICAL ENGINEERING

- GPA: 3.58/4

Chicago, IL
Aug. 2015 - PRESENT

Shahid Beheshti University (former National University of Iran)

B.S. IN ELECTRICAL ENGINEERING

- GPA: 17.09/20 (3.72/4)

Tehran, Iran
Sep. 2010 - Jan 2015

Research Interest

- Robot Autonomy • Robot 3D Perception • SLAM • Localization

Honors & Awards

2014	2nd Place , AUT-CUP Robotic International Competition, Artificial Intelligence league	Amirkabir U. of Tech
2012	2nd Place , ACM ICPC Qualification Programming Contest	S. Beheshti Univ.
2012	19th Place , ACM ICPC West Asia Regional Programming Contest	Sharif U. of Tech
2011	5th Place , ACM ICPC Qualification Programming Contest	S. Beheshti Univ.
2010	Ranked Top 1% , Mathematics and Physics among more than 178,000 students in Iranian nationwide university entrance examination (Konkoor).	Tehran, Iran
2008	Accepted , Iranian National Olympiad Competition in Mathematics	Tehran, Iran
2007	Accepted , Iranian National Olympiad Competition in Computer Science	Tehran, Iran

Work Experience

PLTW Illinois

IT EXPERT

- Tech support and IT Technician

Chicago, IL
Jun. 2016 - Sep. 2016

Hooshmand Afzar CO (Pish Robot)

DIGITAL DESIGNER

- Designing and Implementing robot control circuits

Tehran, Iran
Jan. 2012 - Jun. 2012

Rahjuyan Sanat Taban CO (RST)

DIGITAL DESIGNER

- Digital & Analogue Circuits Designing and Implementing

Tehran, Iran
Jun. 2012 - Dec. 2012

Skills

Programming	C/C++, ROS, Python, C#, MATLAB, JAVA, VHDL, Verilog, LaTeX
Smart Phone Programming	iOS (Swift), Android
Web	HTML, CSS, JS, php
Controllers	AVR, ARM, FPGA, Raspberry Pi, Arduino
PCB Layout	Altium Designer
Languages	Persian (native), English (fluent), Arabic(Intermediate)

Teaching Experience

2017	Wireless Communications , Teaching Assistant	UIC
2016	Digital Communications , Teaching Assistant	UIC
2016	Solid State Device Theory , Teaching Assistant	UIC
2016	Logic Design , Teaching Assistant	UIC
2015	Computer Communication Networks I , Teaching Assistant	UIC
2015	Probability and Random Processes , Teaching Assistant	UIC
2012-13	Digital Logic Design , Teaching Assistant	S. Beheshti Univ.
2012-13	Robotics Workshop , Instructor	Mofid I Highschool
2012-13	Robotics Workshop , Instructor	Mofid III Highschool
2012-13	Robotics Workshop , Instructor	Danesh Highschool
2012	Mathematics and Physics , Instructor	Allame Highschool
2012	Mathematics and Physics , Instructor	Salam Highschool
2012	Mathematics and Physics , Instructor	Talash Highschool

Projects

2017	Computer Vision , Implementing different CV algorithms on OpenCV	Udacity
2017	Machine Learning , Implementing different ML algorithms on MATLAB	Coursera
2017	Image and Video Processing , Implementing Image and Video processing methods on OpenCV	Coursera
2016	Wireless Communication , Simulating LTE system on MATLAB	UIC
2016	Information Theory , Survey paper on Rate in Finite Blocklength	UIC
2015	Digital Control , Implementing a current source controlling with PID using ARM	S. Beheshti Univ.
2015	Image Processing , Implementing Different kinds of Visual Cryptography using both MATLAB and C#	S. Beheshti Univ.
2014	Communication Circuits , Simulating a Low Noise Amplifier (LNA) with ADS	S. Beheshti Univ.
2014	Digital Signal Processing(DSP) , Simulating Different kinds of filters (butterworth, chebishev etc) with MATLAB	S. Beheshti Univ.
2013	Industrial Electronics , Simulating different kinds of convertes(buck, boost, buck- boost) with MATLAB	S. Beheshti Univ.
2012	Electronics II , Designing, Simulating and Implementing a High gain Amplifier with low noise	S. Beheshti Univ.

Test Scores

TOEFL

SCORE: 105

- Reading (29/30), Listening (29/30), Speaking (22/30), Writing (25/30)

GRE

SCORE: 313

- Analytical (3.5/6.0), Quantitative (167/170), Verbal (146/170)

Hobbies

- Professional Swimming • Mountain climbing • Biking

References

References available upon request