

# Mohammad Mousaei

ROBOTICS RESEARCHER · CARNEGIE MELLON UNIVERSITY

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## Research Experience

### Carnegie Mellon University

RESEARCH ASSOCIATE AT FIELD ROBOTICS CENTER

Pittsburgh, PA

Nov. 2017 - present

- **Developing Planning Software for multi-agent air/ground robots for DARPA Subterranean Challenge:**  
Adviser: Dr. Sebastian Scherer
  - Developing simulation environment in gazebo and implementing Global and Local Trajectory Planner in ROS.
- **Successfully deployed first of its kind, autonomous inspection system for decommissioning uranium enrichment facilities**  
Adviser: Prof. William (Red) Whittaker
  - Leading Autonomy team for state estimation, 3D Perception and state machine.
  - Control/ROS developer for attitude and position control.
- **Developing Software/Hardware for Moon Rover Robot**  
Adviser: Prof. William (Red) Whittaker
  - Developing Software/Hardware of a custom designed light weighted LiDar to construct a 3D point cloud of environment

### University of Illinois at Chicago

RESEARCH ASSISTANT AT NICEST LAB

Chicago, IL

Aug. 2015 - Nov 2017

- **Designing a fully integrated radar and communication system**  
Adviser: Dr. Besma Smida
  - Proposing, Formulating and Designing the integrated radar and communication system using pilot symbols
- **Optimizing Pilot Overhead for Ultra-Reliable Short-Packet Transmission**  
Adviser: Dr. Besma Smida
  - Formulating and Optimizing wireless communication systems for short packet communication.

### Sharif University Of Technology

RESEARCH ASSISTANT AT COMPUTER VISION LAB

Tehran, Iran

Nov. 2014 - Feb. 2015

- **Designing and Implementing an autonomous home assistant robot for participating in AUT-CUP competitions**  
Adviser: Dr. Mansour Jamzad
  - Design and Implementation of an at-Home robot (Electromechanical Platform, Motion planning, Control)

### Tehran Polytechnic University

RESEARCH ASSISTANT AT COMPUTER VISION LAB

Tehran, Iran

Jan. 2015 - Jul. 2015

- **Developing an autonomous home assistant Robot for ROBOCUP 2015 (Joao Pessoa, Brazil)**  
Adviser: Dr. Saeed Shiry
  - ROS/OpenCV developer for object detection

## Skills

<b>Programming</b>	C/C++, C#, Python, MATLAB, JAVA, VHDL, Verilog, LaTeX
<b>Robotic Programming Tools</b>	ROS (Robot Operating System), OpenCV, PCL, OMPL, Gazebo
<b>Smart Phone Programming</b>	iOS (Swift), Android (JAVA)
<b>Web</b>	HTML, CSS, JS, php
<b>Microcontrollers</b>	AVR, ARM, FPGA, PLC
<b>PCB Layout</b>	Altium Designer
<b>Languages</b>	Persian (native), English (fluent), Arabic(Intermediate)

## Education

### University of Illinois at Chicago

M.Sc. IN ELECTRICAL AND COMPUTER ENGINEERING

Chicago, IL

Aug. 2015 - PRESENT

### Shahid Beheshti University (former National University of Iran)

B.S. IN ELECTRICAL AND COMPUTER ENGINEERING

Tehran, Iran

Sep. 2010 - Jan 2015

## Publications

- **M. Mousaei**, S. Vahidian, B. Smida, "Training Signal Optimization for Communication in Finite-Blocklength: An Analytical Approach", **IEEE Communications Letters**, *Under Preparation*.
- **M. Mousaei**, M. Soltanalian, B. Smida, "ComSens: Exploiting Pilot Diversity for Pervasive Integration of Communication and Sensing", **IEEE Military Conference on Communication**, Oct 2017.
- **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.
- **M. Mousaei**, A. Keipour, E. Babaian, "Automated High-Speed Traffic Monitoring and Violation Detection Using RFID Technology", **IEEE Iranian Conference on Electrical Engineering**, May 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.

## Honors & Awards

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

## Work Experience

### PLTW Illinois

IT EXPERT

*Chicago, IL*

*Jun. 2016 - Sep. 2016*

- Debug and Troubleshoot Network technical problems
  - Finding and tuning bottleneck of the network (NIC, Soft interrupt, Kernel buffer, Network layer, etc)

### Hooshmand Afzar CO (Pish Robot)

DIGITAL DESIGNER

*Tehran, Iran*

*Jan. 2012 - Jun. 2012*

- Designing and Implementing a differential drive mobile robot
  - Designing Control System (PID Hybrid Control system with Go-to-Goal and Obstacle-Avoidance states) and implementing with ROS on Raspberry Pi platform

### Rahjuyan Sanat Taban CO (RST)

DIGITAL DESIGNER

*Tehran, Iran*

*Jun. 2012 - Dec. 2012*

- Design and Implementing digitally controlled current source
  - Analog/Digital Design of a closed loop digital control system using PID controller and Implementing the designed using C++ on ARM Cortex-M3 (LPC1768) Microcontroller.

## Test Scores

### TOEFL

SCORE: 105

*ETS*

*Dec. 2014*

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

### GRE

SCORE: 313

*ETS*

*Nov. 2014*

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