Mehdi Mehdikhani

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RESEARCH INTERESTS

- **Robotics, SLAM and Navigation, Computer Vision, Machine Learning, Algorithms, Artificial Intelligence, Human-Robot Interaction, Mechatronics, Embedded Systems**

- As an individual with a great enthusiasm for robotics, I am interested in designing and enhancing technologies to create a positive impact on solving real-world problems. Computer science methods (image processing, artificial intelligence, machine learning, algorithms), control theory and embedded systems are my tools to encounter robotics challenges.

EDUCATION

- **Isfahan University of Technology** (IUT)**,** B.Sc. in Computer Engineering (Software), Isfahan, Iran. 2012 – 2017
  Overall GPA: 16.68/20
  Last two years GPA: 18.2/20
  Thesis: Theoretical study and practical implementation of Simultaneous Localization and Mapping (SLAM) and map-based indoor navigation, **Score: 20/20**, 2016
  Supervisors*:* Prof. Mehdi Keshmiri, Dr. Nader Karimi
- **Pre-University Diploma**, Physics and Mathematics, Isfahan, Iran, **GPA: 19.81/20**, 2011-2012
- **High School Diploma**, Physics and Mathematics, Isfahan, Iran, **GPA: 19.62/20**, 2008-2011

RESEARCH EXPERIENCE

- **Research Assistant** at Advanced Robotics and Mechatronics Laboratory (ARMLab), Department of Mechanical Engineering, Isfahan University of Technology, Iran, 2015-Present.

  Major duties:

  - Design and construction of new robotic platforms.
  - Modification and maintenance of the available platforms.
  - Implementation and assessment of various SLAM and navigation algorithms.
  - Help other students in their research and thesis.

- **Robotics Engineer** at dynamic and robotics center, Department of Mechanical Engineering, Isfahan University of Technology, Iran, 2013-2014.

  Major duties:

  - Design and construction of a new hardware interface for a Stewart platform.
  - Help other students in implementing their codes on robots.
  - Help other students for construction of new robotic platforms.
  - Implementation and test of various control algorithms.

PATENT

- **Expandable data acquisition and motor control device:**
  The device is an interface between a controller (PC, Microcontroller, PLC, …) and various types of rotary encoders, motor drivers and conventional sensors. The most important feature of this device is the ability to connect to more peripherals by adding extension boards to it. (Patent acquired in Iran, Registration Number: 92172). 2016 – (More details)

SELECTED PROJECTS

- **Design and construction of a differential drive mobile robot** with the ability to do simultaneous localization and mapping and map-based indoor navigation. 2016. (**B.Sc. Thesis**) - (More details)
- **Design and construction of a high-precision polishing tool** with the ability to control machining forces. The device can connect to a milling machine and control the force applied by its end effector. Design and construction of embedded system and control software of the device, with an innovative approach to force feedback. 2015. (**Industrial Project**) – (More details)
- **HMI design and PLC programming** for pipelines pressure control and automatic scheduling of working hours in a water pumping station. Organon Sanaat Sepahan Co. Isfahan, Iran, 2016. (**Summer Internship -** Industrial Automation) – (More details)
- **Manage a rescue team** consisting of nine main members. Design and construction of a remote-control belt-type mobile robot with a compatible configuration for rescue operations and a quad-rotor with the ability to do semi-autonomous flight and 3D SLAM. 2014 - 2016. (**Team Manager**) – (More details)

PUBLICATIONS

Accepted Paper:

- Mehdi Mehdikhani*, Mohammad Amin Fahami*. **A Model Free Approach to General Video Game Playing.** 4th IEEE International Conference on Knowledge-Based Engineering and Innovation (KBEI 2017). (*equal contribution)

  In this paper, we tried to eliminate two significant problems in general video game playing, the assumption of availability of an exact model of the world and performing a search in an online way. We introduced an offline method for learning the model of the world.

Submitted Paper:

- Mohammad Soltanshah, Mehdi Mehdikhani, Mehdi Keshmiri, Morteza Badali. **An improved dynamic window approach using fuzzy logic for mobile robot local planning.**

  In this research, we introduced an improved version of dynamic window approach by using fuzzy logic. We showed that the new method is more efficient and more optimized than the raw DWA, especially in cluttered environments.

HONORS AND AWARDS

- **Ranked 4th** (in the top 5%) among 73 electrical and computer engineering undergraduates, 2012 - 2016.
- Recognized as **Gifted Student** and Granted **Gifted Student Award** in 2011, Isfahan University of Technology, 2013
- Ranked among the first **0.07%** of more than 260,000 participants in the national entrance exam of universities, 2012.
- **Ranked 1st** in the Kharazmi young competition (The highest ranked scientific competition in Iran hold by top Iranian scientific organizations including "Science & Research Ministry, Education Ministry, Industrial Research Organization, Nation Organization for Development of Exceptional Talents), Robotic branch – 2011.
- Recognized as **gifted and talented student** in the national entry exam of National Organization for the Development of Exceptional Talents (NODET), 2003 and 2006.

LANGUAGE SKILLS

- **English**: Full Professional Proficiency
- **Persian**: Native
- **Azerbaijani**: Native (Bilingual Proficiency)
- **Turkish:** Minimum Professional Proficiency

TECHNICAL SKILLS AND TOOLS

- **Programming Languages:** C++, Python, Java, C#, SQL, Lisp, AIML, Processing
- **Frameworks & Libraries**: ROS, OpenCV, MoveIt, PCL, Boost, Qt
- **Hardware:** AVR, ARM, Arduino, Raspberry Pi, Various sensors, and modules
- **CAD Software:** Altium Designer, LibreCAD, AutoCAD Electrical, Proteus, Eagle
- **Development Tools & IDEs:** Visual Studio, Qt Creator, Atmel Studio, Keil µVision, Code Vision AVR, IntelliJ IDEA, PyCharm
- **Operation Systems:** Linux Ubuntu, Microsoft Windows
- **Simulators:** Gazebo, V-rep
- **Other:** Git, Microsoft Office (Word, Excel, PowerPoint), LaTeX, CUDA, Multi-Threading, MATLAB and Simulink, Network Programming, Computer Networks, Unity game engine, Microsoft SQL Server, Microsoft Project, Blender, MeshLab, Bizagi, Photoshop

TECHNICAL PRESENTATIONS

- **Real-time operation systems**, Isfahan University of Technology, Department of Electrical and Computer Engineering, 2015
- **Software Engineering for embedded systems**, Isfahan University of Technology, Department of Electrical and Computer Engineering, 2015
- **Robotic Competitions, opportunities, and challenges**, Isfahan University of Technology, Department of Mechanical Engineering, 2014
- **Introduction to Reinforcement learning**, (Special Topics in Computer), Isfahan University of Technology, Department of Electrical and Computer Engineering, 2015
- **Robot Gestures Make Difficult Tasks Easier**, (Human-Computer Interaction), Isfahan University of Technology, Department of Electrical and Computer Engineering, 2015

TEACHING EXPERIENCE

- **Teaching Assistant**, Advanced Programming, Isfahan University of Technology, Department of Electrical and Computer Engineering – Fall 2014, Spring 2014
  - Designed homework problems and held problem-solving sessions
- **Laboratory Instructor**, Advanced Programming (C++), Isfahan University of Technology, Department of Electrical and Computer Engineering - Spring 2014, Fall 2015
- **Workshop Instructor**, ROS & Gazebo workshop, Isfahan University of Technology, Department of Mechanical Engineering – 2015,2016
- **Workshop Instructor**, PCB Design workshop, Isfahan University of Technology, Department of Electrical and Computer Engineering – 2015
- **Robotic Tutor**, Robotics tutor in Professor Hessabi student research center, 2014. (More details)

LANGUAGE SKILLS

- **English**: Full Professional Proficiency
- **Persian**: Native
- **Azerbaijani**: Native (Bilingual Proficiency)
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RELATED ACADEMIC COURSES

Engineering Mathematics	20/20	Computer Networks	17.5/20
Artificial Intelligence	17.5/20	Digital System Design	18.3/20
Design and Analysis of Algorithms	18.8/20	IT Project Management	20/20
Human Computer Interaction	19.4/20	E-Commerce	19.2/20
Embedded Systems Design	20/20	Industrial Management & Economics	18.8/20
Microprocessors	20/20		

UNOFFICIAL ATTENDANCE COURSES

- Signals and Systems
- Automatic Control
- Linear Algebra
- Fundamentals of Image Processing
- Mechanics of Robotic Systems

HOBBIES

- Travelling, Swimming, Hiking, Public Speaking, Music

REFERENCES

- Available upon request.