Mehdi Mehdikhani

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RESEARCH INTERESTS

- **Robotics**, **Autonomous Vehicles, Embedded Systems, Automation and Control, Computer Vision, Machine Learning, Artificial Intelligence, Human-Robot Interaction**
- 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 Software Engineering, Isfahan, Iran. 2012 – 2017, Last two years GPA (60 Credits): **18.2/20**
  Thesis: Theoretical study and practical implementation of Simultaneous Localization and Mapping (SLAM) and map-based indoor navigation (Details), **Score: 20/20**, 2016
- **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, IUT, 2015-2018.
  - Design and construction of hardware and software for 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.
  - Manage a rescue robot team, consist of nine people to create an autonomous rescue robot

WORK EXPERIENCE

- **C/C++ Programmer,** Implementing various algorithms on STM32 discovery kit and AVR Microcontrollers, PLC Programming, Organon Sanaat Sepahan Co. Isfahan, Iran, 2017-2018
- **Robotics Engineer** at dynamic and robotics center, Department of Mechanical Engineering, IUT, 2013-2014.
  - Design and construction of a new hardware interface for a Stewart robot platform.
  - Help other students in implementing their codes on robots.
  - Implementation and test of various control algorithms.

INTERNSHIP

PLC Programming and HMI design, Pipeline pressure control and automatic scheduling of working hours in a water pumping station. Organon Sanaat Sepahan Co. Isfahan, Iran, 2016. (Details)

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 – (Details)

PUBLICATION

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).

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.

PROJECTS

- **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. I redesigned and constructed the embedded system and control software of the device, and also I introduced an innovative approach to measure force feedback by creating a new force sensor. 2015. (Details)
- **DC Motor torque and speed control board,** This device is able to control the speed and the torque of a DC motor. Furthermore, with the help of an encoder, we can calculate the speed and theta of the motor and reach a desired position or speed. 2017. (Details)
- **Time and date server by LPC1768** with the ability to send time and date on various connection protocols such as Ethernet, RS232, RS485, I2C and SPI. 2016. (Details)
- **Two-axis gimbal prototype,** by using Dynamixel servo motors and Xsens IMU. 2014. (Details)
- **Thermal camera** with the TPA81 infrared sensor. 2015. (Details)

HONORS AND AWARDS

- **Ranked 4th** (in the top 5%) among 73 electrical and computer engineering undergraduates, 2012 - 2017.
- **Merit-based** Admission Offer to the M.Sc. program, at Isfahan University of Technology and Amirkabir University of Technology without participating in the Nationwide University Entrance Exam. Iran. (Declined - 2017)
- Awarded a **full scholarship** by Open Source Robotics Foundation to participate in the ROSCon held in Vancouver, Canada, 2017.
- 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.

TECHNICAL SKILLS AND TOOLS

- **Programming Languages:** C++, Python, Java, Assembly, C#, SQL, Lisp, AIML, Processing
- **Frameworks & Libraries**: ROS, OpenCV, MoveIt, PCL, Boost, Qt
- **Hardware:** AVR, ARM, Arduino, Raspberry Pi, Digital Logic ICs, Various Sensors and Modules
- **CAD Software:** Altium Designer, LibreCAD, Proteus, AutoCAD Electrical, Eagle
- **Operation Systems:** Linux Ubuntu, Microsoft Windows**,** FreeRTOS
- **Simulators:** Gazebo, V-rep
- **Other:** Git, CUDA, MATLAB and Simulink, LaTeX, Microsoft Office, Microsoft SQL Server, Microsoft Project, Agile Scrum

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TECHNICAL PRESENTATIONS

- **Real-time operation systems**, IUT, Department of ECE, 2015 (Presentation file)
- **Robot Gestures Make Difficult Tasks Easier**, , IUT, Department of ECE, 2015
- **Software Engineering for embedded systems**, IUT, Department of ECE, 2015
- **Introduction to Reinforcement learning**, IUT, Department of ECE, 2015
- **Robotic Competitions, opportunities, and challenges**, IUT, Department of Mechanical Engineering, 2014

TEACHING EXPERIENCE

- **Teaching Assistant**, Advanced Programming, IUT, Department of ECE - Fall 2014, Spring 2014
- **Laboratory Instructor**, Advanced Programming (C++), IUT, Department of ECE - Spring 2014, Fall 2015
- **Workshop Instructor**, PCB Design workshop, IUT, Department of Electrical and Computer Engineering – 2015
- **Workshop Instructor**, ROS & Gazebo workshop, IUT, Department of Mechanical Engineering – 2015, 2016
- **Robotic Tutor**, Robotics tutor in Professor Hessabi student research center, 2014. (details)

VOLUNTEER EXPERIENCES

- Elected as the head of Computer&IT engineering **Student Scientific Association** at the Department of Electrical and Computer Engineering for two consecutive years: 2014 and 2015**.**
- **Free Discussion Moderator**, Held and moderated Azerbaijani free discussion sessions for about one year at Isfahan University of Technology, 2013.

LANGUAGE SKILLS

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

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.