Seyed Hamid Reza Roodabeh

Curriculum Vitae

Tehran - Iran
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Research Interests

Control Theory | Medical Robotics | Cyber-Physical Systems

Education

Bachelor of Science - Electrical Engineering   Sep 2016 - Sep 2021

Amirkabir University of Technology (Tehran Polytechnic)

GPA: 3.32 | Major: Control Engineering

Research Experience

Undergraduate Research Assistant   Oct 2020 - Aug 2021

Amirkabir University of Technology (Tehran Polytechnic) - EE
Department

- Design and Implementation of Athletes / Patients Recovery Evaluation System for **Wrist Rehabilitation** Robot Based on Machine Learning Theory

- B.Sc thesis - Supervised by Dr. Heidarali Talebi, Dr. Iman Sharifi

Research Software Engineer   Mar 2017 - Dec 2018

Amirkabir University of Technology (Tehran Polytechnic) - Parsian
Robotics Laboratory

- Parsian Robotics Research Laboratory is working on Small Size Soccer League. This team aims to design and build SSL robots, compatible with international RoboCup competition rules as an engineering project. The Small Size league is one of the oldest RoboCup Soccer leagues. It focuses on the problem of intelligent cooperation and control in a highly dynamic environment with a hybrid centralized/distributed system.

Honors

- **Ranked top 0.5%** among 163,000 participants in nation-wide university entrance exam
- **Ranked 3rd place** with parsian robotics laboratory in *IranOpen Robotics 2017* competitions
- Admitted to the second round of the **national *Olympiad in Physics***

Technical Reports

Parsian Extended Team Description Paper for RoboCup 2018

M. M. Rahimi, M. M. Shirazi, M. A. Najaf Gholian, F. Hashemi Chaleshtori, N. Moradi, K. Behzad, **S. H. Roodabeh**, A.Gavahi, F. Farokhi Moghadam, S. A. Ghazi Asgar, Y. Alizadeh Gharib, M. Memarian, A. H. Tavakoli, M. A. Khosravi

Selected Courses

- **Modern Control** : A+
- **Industrial Control** : A+
- **Electrical Circuits Analysis and Design** : A+
- **Digital Signal Processing** : A
- **Instrumentation** : A
- **Computational Intelligence** : A
- **Computer Architecture and Microprocessor Design** : A
- **Computer Networks** : A
- **Advanced Robotics** : A

Online Certified Courses

- **Machine Learning - Coursera**
- **Deep Learning Specialization - Coursera**
- **Linear Algebra - MIT**

Academic and Research Projects

- **Development of Lane Detection Algorithm**
  - Application of computer vision algorithms to the high reliability lane detection problem
  - Edge detection, camera calibration, and advanced digital filter design
  - Python Implementation Based on python openCV package

- **Design, Construction and Control of Two-wheeled Segway**
  - Design and construction of robot mechanical structure and selection of proper electronics and motors
  - Accurate and reliable angular acceleration and velocity measurements using IMU unit and digital filter processing
  - Balance control of the Segway using neural network plus fuzzy control algorithms

- **Network-distributed Control of a Grid of DC Motors in an IoT Setting**
  - Wireless control of an arbitrary number of dc motors, suited to IoT use cases
  - Design and development of an intuitive user control panel, implemented using PyQt library, running on a PC as central control unit
  - Data relay nodes, realized via NodeMCU Arduino boards for data transmission
  - PID algorithm runs on ARM microcontrollers to control angular position, velocity and acceleration

- **Smart Home Kit**
  - Temperature, light and air quality monitoring and regulation
  - Transmission of sensor data to cloud platform via MQTT protocol
  - Design and implementation of a monitoring dashboard for the cloud panel

- **Image Processing on Bare-metal Arm Microprocessor**
  - Implementation of a number of image processing and enhancement algorithms, using *Assembly* only
  - Edge detection, gaussian blur filtering, sharpening etc.

- **Development and Controller Design for 5 Degrees of Freedom Robot Manipulator**
  - Construction of the manipulator parts based on an open source project via a 3D printer
  - Enhancement of mechanical specifications relative to base design schematics
  - Controller design for pick-and-place task via inverse-dynamics method

Skills

Programming languages

- Python
- C / C++
- Java
- Matlab / Octave

Machine Learning	
	• Scipy / OpenCV / Numpy / Pandas
	• Tensorflow / Keras / Pytorch

Digital Hardware and CAD Tools	
	• Microcontrollers: *ARM / Arduino*
	• Digital Design: *VHDL*
	• Schematic and PCB Design: *Altium Designer*
	• DC Motors and Drivers: *Brushed, Servo, Stepper*

Software Frameworks	
	• Robot Operating System (ROS) / Gazebo
	• Qt / PyQt
	• Git / DVC

Work Experience

Data Scientist - Part Time
Jan 2021 - Sep 2021

Sotoon

- Help Building more Intelligent and Efficient Costumer Support Services Platforms. Use Methods of Statistical Analysis and Data Analytics to Extract Business Insight from Customer's Inquiries and Behaviors.

Data Scientist - Part Time
Feb 2020 - Jan 2021

Cafebazaar

- Development of Costumer Support Services Including Automatic Ticket Answering, Spam Detection and Summary Generation for Product and Services Advertisements.

Machine Learning Engineering Internship
Dec 2018 - Feb 2019

Rahnema Co. | Rahnema College

- Development of Image Classification and Recommender Systems for Mobile Application Users.

Translator and Editor - Student Job
March 2013 - May 2015

Zoomit

Wrote Articles on such topics as Technology Trends and news, reviews of recently released mobile phones, computers, tablets and many other digital devices

Languages

- English - Fluent
  - IELTS: 8 | S: 8, L: 8.5, R: 8.5, W: 7
  - GRE : 225 | Verbal: 160, Quantitative: 165, Analytical Writing: 4
- Persian - Native

Extra-curricular Activities

- Guide - International Olympiad in Informatics , Tehran 2017