Barzin Moridian

SKILLS

Automation and Robotics: Hands-on Experience • Microprocessors and FPGA programming • signal processing • sensors and actuators selection and utilization • sensor fusion • path planning and tracking • feedback controller design • NI RIO boards • xPC Target Machine• Arduino

Controls: System analysis and linear/non-linear control • mathematical modeling • extended and unscented Kalman filtering • system identification • online parameter estimation • optimal control

Computer Skills:

- Labview (NI Certified)
- Matlab and Simulink
- C/C++
- Python
- JavaScript
- MS Project
- ANSYS
- SolidWorks
- Auto CAD
- Machining/Welding
- Microsoft Office Suite
- 3Ds MAX
- Adobe Photoshop
- HTML/CSS

EXPERIENCES

Mechatronics Engineer and **Team leader** of Autonomous Ground Vehicles group of 6 Members — Fall 2012 – Present — NASLab, Houghton, MI

- Programed Microcontrollers and FPGAs (Labview, Matlab/Simulink, C/C++) for automating ground robots in two categories of lab-size (30lbs) and world-size(700lbs)
- Automated multiple ground robots to establish a mobile microgrid in a collaborative and autonomous manner
- Constructed a multipurpose simulation environment for analysis of dynamics and controls of different types of ground vehicles
- Developed Path planning and path tracking algorithms for having self-sufficient navigation system on mobile robots
- Designed control systems and validated the results from experimental analysis
- Developed drivers for sensors and motor controller (Labview and Matlab/Simulink)
- Integrated different sensors and sensor fusion on robot (LIDAR, Vision, Sonar, IR, IMU, GPS)
- Performed analog and digital signal processing on sensor outputs for debugging
- Designed and modeled mechanical components (SolidWorks)
- Manufactured mechanical components by 3D printing and machining
- Captured and analyzed robots' motion using High precision cameras and integrating data in control system
- Developed task schedules, timelines, deadlines and documentation
- WBS and Gantt chart development
- Assigned tasks according to team member strengths, skills, and abilities
- Motivated high performance and adherence to timelines
- Coordinate and edit project technical report and oral presentation made to corporate, professional and academic audience

Instructor of Dynamic Systems and Controls lab – 32 students — Fall 2013 — Michigan Technological University, Houghton, MI

- Taught modern controls to graduate and undergraduate students in a lab environment
- Guided them through system identification, dynamic system modeling, control system design, simulation, experimenting, control parameter tuning based on simulation and experiment
- Addressed learner issues such as language and computer skill

Instructor of Manufacturing Precision and Metrology – 39 students — Spring 2014 — Michigan

- Operated Cobra Laser Profilometer with DRS8000 scan head, S3P Perth-o-meter, Nikon Autocollimator,

Tolyrond, Brown & Sharp MicroVal CMM — Technological University, Houghton, MI

- Taught different metrology methods to graduate and undergraduate students in a lab environment.
- Guided students through operating precision devices, error minimization practices, analysis of measurement based on mechanical engineering concepts and statistics methods

Controls Engineer for HVAC adaptive controller design — Fall 2012 — Energy Mechatronics Laboratory, Houghton, MI

- Developed algorithm for dual state-parameter real time estimation
- Analyzed and developed Linear and nonlinear mathematical model
- Performed Numerical optimization of system parameters
- Implemented Extended and Unscented Kalman Filtering dynamic models
- Analyzed validation of experimental and simulation results
- Developed WBS and Gantt chart

Design Engineer and **Project manager** of Aircraft Design Project - 14 members — 2009 - 2010 — Amirkabir University of Technology, Tehran, Iran

- Analyzed Local market and climate
- Generated conceptual and first level design
- Analyzed modifications for AN-140 aircraft
- Modeled 3D design of a modified AN-140 aircraft (CATIA)
- Scheduled and conducted team meetings
- Developed task schedules, timelines and deadlines
- Assigned tasks according to team member strengths, skills, and abilities
- Motivated high performance and adherence to timelines
- Coordinate and edit project technical report and oral presentation made to corporate, professional and academic audience

Controls and Design Engineering Intern of industrial refrigeration systems — Summers of 2009, 2008 & 2007, ZAV Co., Tehran, Iran

- Coded and tested HVAC controllers (Siemens Controllers)
- Calculated HVAC systems load
- Performed market analysis for emerging technologies
- 3D modeling of parts and their composition (SolidWorks)

Freelance Graphic Designer — 2008-2010 — Tehran, Iran

- 2D/3D graphic design for different groups and associations in Amirkabir University of Technology (Photoshop, 3D MAX)

EDUCATION

M.S. Mechanical Engineering, Michigan Technological University, — 2014
GPA: 3.67 — Houghton, MI

B.S. Aerospace Engineering, Computational Research Center of Excellence, Amirkabir university of technology (Tehran Polytechnic), — 2012 — Tehran, Iran

PERSONAL PROJECTS

Machine Learning, Genetic Algorithm, Image Processing and Stereo Vision, Agile Software Development

HONORS

- Author of 3 accepted conference papers on Control Systems
- Best Student Paper Award Finalist in ASME 2013 Dynamic Systems and Control Conference
- Ranked 582nd among more than 450,000 participants (top 0.13 %) in the National Undergraduate University Entrance Exam
- Educated in National Organization for Development of Exceptional Talents, Ahvaz, Iran