Payam Ghassemi

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EDUCATION

Doctor of Philosophy (PhD), *Mechanical Engineering*, SUNY Buffalo, NY *02/2021*
Dissertation: "*Decentralized Planning Algorithms and Hybrid Learning for Scalable and Explainable Swarm Robotic Systems*"; Cumulative GPA: 4.00/4.00
Journal paper: 5, Conference papers: 11, Citation: 49, Google Scholar

Master of Science (MS), *Mechatronics Engineering,* University of Tehran, Iran *03/2015*
Thesis: "*Push Recovery and Balancing of NAO Humanoid Robot*"; Cumulative GPA: 18.79/20.00. Ranked 2nd out of 12 students.
Conference papers: 4

Bachelor of Science (BS), *Robotics Engineering*, Shahrood University of Technology, Iran *07/2011*
Final Project: "*A Comparative Study on Solving Inverse Kinematics of Serial Robots using Neural Networks and Neuro-Fuzzy Methods*"; Cumulative GPA: 17.03/20.00. Ranked 1st out of 57 students.

PROFESSIONAL EXPERIENCE

SUNY Buffalo – Buffalo, NY USA
Research Assistant
Involved in the following four main projects:

- ***Cognitive-Behavior Model to Predict Human Reaction to Swarm AI Non-Compliance (Funded by NSF),*** *01/2020 – Present*
  - Created design of experiments for human subject studies
- ***Swarm Tactics Design (Funded by DARPA),*** *08/2019 – 08/2020*
  - Developed novel decentralized swarm algorithms for source localization by swarm robots via batch Bayesian search and scalable multi-robotic task allocation via graph theory
  - Investigated learning and imitation learning methods (learning by observing experts) to learn robust swarm tactics
  - Led a group of four PhD students involved in project to prepare monthly reports for DARPA
  - Participated in a 5-day field experiments
- ***Machine Learning & Optimization Algorithm for Bio-inspired Design,*** *01/2017 – 06/2019*
  - Developed a novel variable-fidelity optimization based on probabilistic modelling and batch Bayesian optimization
  - Integrated a fully automated CFD framework, utilizing high performance computing resources using MPI, to find optimum riblet design for maximizing aerodynamic efficiency (up to 17% drag reduction)
- ***Investigating UAV Noise Impact on Human Hearing and Cognition,*** *06/2018 – 06/2019*
  - Designed a specialized experimental setup for testing impact of noise produced from small multi-rotor quadcopters on hearing and cognitive performance of humans
  - Carried out design of experiments to conduct human subject study
  - Determined significant features that impact hearing using statistical analysis

COE Sustainable Manufacturing and Advanced Robotic Technologies (SMART) – Buffalo, NY USA
Project Manager *06/2017 – 05/2019*

- Mentored a team of 20 engineers from across different engineering disciplines (MAE, EE, IE, and CS)
- Developed two prototypes of an autonomous snow removal vehicle, so-called "SnowBot"
- Devised a full-size and operational version of SnowBot

POUYESH PARDAZ CO. – Tehran, Iran
Lead R&D Engineer *01/2015 – 01/2017*

- Managed factory workers, engineers, quality assurance team, and commercial experts to run production line of different automotive electronic equipment/devices
- Delivered Multi-Function Display (MFD) with mass production (a few thousands per month)

FREELANCER – Tehran, Iran
Embedded System Developer *09/2012 – 06/2015*

- Developed and implemented an automatic car park monitoring system -- using wireless car detector nodes powered by an ultra-low-power “STM8L15x“ microcontroller, identify cars using magnetic sensor “HMC5883L”, and communicate with its server using radio transceiver “nrf2401”
- Designed system architecture and electrical section of an unmanned ground vehicle (UGV)

POUYESH PARDAZ CO. – Tehran, Iran
Embedded System Developer *06/2013 – 12/2014*

- Designed and implemented an ARM Cortex-based automotive Multi-Function Display (MFD) (CAN bus-based device) with 48,000+ lines of C code (based on MISRA C coding standards)
- Engineered a 3-axis CNC machine (PC-based)
- Built a CAN bus analyser using Matlab GUI and ARM Cortex-based MCU (STM32F10x)
- Developed various device testers/simulators for automotive equipment and production line

UNIVERSITY OF TEHRAN – Tehran, IRAN
Research Assistant *09/2012 – 04/2015*

- Implemented MPC and PID controllers in C++ on humanoid robots with 25 degrees of freedom

SEEO CO. (AUTOMATION AND ROBOTICS BRANCH OF SAIPA) – Tehran, Iran
Robotics Engineer (Intern) *06/2009 – 08/2009*

- Programmed ABB industrial manipulator for paint booth water jet cleaning
- Achieved maintenance and repair for Pars Khodro factory paint shop
- Studied and analysed electromechanical design of B&M 7-DoF manipulator

SKILLS

Programming Languages & Libraries: C/C++; Python; Matlab; TensorFlow; Gurobi; MPI; PHP; HTML; jQuery
Simulator & OS: ROS; PyBullet; V-REP; AirSim; NAOqi; LinuxCNC; uC/OSII RTOS
Statistical & Computing Tools: Gaussian Process; Neural Network; Heuristic and Bayesian Optimizations; Reinforcement Learning; Robotic Algorithms for Path Planning and Localization; Kalman Filter; Balancing of Humanoids; MANOVA
Hardware/Platforms: NAO H25; TurtleBot 3; e-puck; Raspberry Pi; ARM Cortex-M3, STM8L15X, PIC, and AVR Microcontrollers; Arduino; PLC; DC and Stepper Motors; Communication Protocols: I2C, SPI, UART, and CAN bus
Electrical/Mechanical Software: Solidworks; AutoCAD; Altium (Schematic & PCB).
Other Tools: Git; SVN; LaTex; Doxygen; Unix Shell Script
Languages: English, Persian (Farsi), and Kurdish

SELECTED COURSES

PhD: Advanced Robotics (Probabilistic Reasoning), Robotics Algorithms, Network Science, Stochastic Simulation and Inference, High-Performance Computing (HPC) 1, Machine Learning, Heuristic Optimization, CAD Application.

MS: Advanced Robotics (Kinematics & Dynamics of Serial Robots), Neural Network, Nonlinear Control, Optimal Control, System Identification, Model Predictive Control, Convex Optimization.

BS: Robotics, Robot Control, Sensors, Microprocessors, Control, Mechanism Design, Dynamics, Fuzzy Control.

AWARDS & HONORS

- University at Buffalo School of Engineering and applied Science Dean’s Graduate Achievement Award 2020
- Best Student Paper, AIAA MDO 2019, 3rd Prize
- NSF travel awards to attend IEEE MRS 2019
- University at Buffalo School of Engineering and applied Science Dean’s Scholarship 2017