Parsa Yazdankhah

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Education

University of Tehran 2019 – Expected 2024

Bachelor of Science in **Mechanical Engineering** Tehran, Iran

- GPA: 3.86/4.0 (18.29/20)

University of Tehran 2020 – Expected 2024

Minor in Business Management Tehran, Iran

- GPA: 4.0/4.0 (18.62/20)

Research Interests

- Robotics / Soft Robotics
- Wearable / Assistive Robots
- Bio-inspired Systems
- Mechatronics
- Control Engineering
- Machine Learning

Experiences

Research Assistant Feb 2022 – Present

Center of Advanced Systems & Technologies (CAST), University of Tehran Tehran, Iran

- Collaborated as a Dynamics and Control team member of *SURENA* humanoid robot
- Executed a feasibility study and recommended an energy-efficient automated system for thermal inspection
- Contributed in modal analysis through hammer impact testing, along with MATLAB script development for data processing

Artificial Intelligence Intern Jul 2023 – Sep 2023

Cheetah Autonomous Vehicles Center, Sharif University of Technology Tehran, Iran

- Developed extensive python scripts within *CARLA* simulator (an open-source tool for autonomous driving research), executing algorithm deployment and evaluating performance against ground truth data

Teaching Assistant Feb 2021 – Jun 2023

School of Mechanical Engineering | College of Engineering, University of Tehran Tehran, Iran

- Mechatronics | *Dr. Moosa Ayati* | Spring 2023
- Numerical Computations | *Dr. Ali Fahim* | Spring 2022 & Fall 2022
- Computer Programming | *Group of Professors* | Fall 2021 & Spring 2022
- Calculus 1 | *Dr. Hossein Rahami* | Fall 2020

Technical Manufacturing Intern Jul 2021 – Oct 2021

Behran Asanbar Industrial Group Tehran, Iran

- Accumulated hands-on experience while collaborating with a diverse set of equipment, including lathe machines, milling machines, drilling machines, CNC systems, and CAD tools

Publications

- M. Mehdikhani, **P. Yazdankhah**, R. Nasiri, *"Lower Limb Joint Angle Estimation From Ground Reaction Force Using Physics-Informed Neural Networks"*, In Preparation
- A.H. Vedadi, **P. Yazdankhah**, A. Yousefi-Koma, M. Shariat-Panahi, *"Real-time localization and configuration identification of a humanoid robot using machine vision"*, In Preparation

Technical Skills

Programming:
Python | C/C++ | MATLAB

Design & Analysis:
SolidWorks | CATIA | ANSYS | ABAQUS | MSC Adams | Maple | OpenSim | Proteus

Simulators:
Simulink | Choreonoid | PyBullet | Gazebo | CarLa

Miscellaneous:
ROS | Git | Linux | Arduino | MS Office | LaTeX

Selected Projects

***SURENA* Humanoid Robot (5th Generation)** | *Python, C++, ROS, Git, Choreonoid simulator*
- Developed an online trajectory planner utilizing the Divergent Component of Motion (DCM) method
- Enhanced the robot's Center of Mass (CoM) positioning through the redesign of upper-body components and the creation of a novel casing
- Conducted simulations using *Choreonoid* simulator to validate algorithm performance prior to robot deployment

Lower Limb Joint Angle Estimation from Vertical Ground Reaction Force | *Python, TensorFlow, Git*
- Implemented a novel neural networks architecture utilizing physics-informed networks to anticipate ankle, knee and hip joint angles from ground reaction forces of both soles
- Facilitated real-time gait analysis of subjects with minimal data

Solar Tracker System | *Arduino, SolidWorks*
- Designed and constructed a functional prototype of a 2 DoF solar tracker system, including the successful integration of the control algorithm
- Optimized for rapid alignment with the light source in under 2 seconds and maintains light source tracking with an angular velocity of 2 rad/s

Identification and Control of a Serial Industrial Manipulator | *MATLAB, Simulink, Simscape, Maple*
- Analyzed the dynamics of the *Motoman SK16* robotic arm, and implemented several classic controllers (CTC, Impedance, PID) to evaluate and contrast their respective performances
- Coupled two of these serial manipulators together to form a parallel robot, assessing its operational efficiency in comparison to the original serial robot

Study of Human Gait Metabolic Energy Consumption | *OpenSim, MATLAB*
- Investigated the metabolic energy consumption of walking, employing both active and passive assistive devices
- Proposed an optimal assistive device that effectively minimized muscle fatigue, mechanical workload and average metabolism

Selected Courses

Academic Courses University of Tehran
- Automatic Control (4/4)
- Rehabilitation Robotics (4/4)
- Mechatronics (4/4)
- Mechanical Vibrations (4/4)
- Measurement Systems and Instrumentation (4/4)
- Optimization of Mechanical Systems (4/4)

Extracurricular Courses
- Machine Learning Specialization | *Coursera*
  - Supervised Machine Learning: Regression and Classification
  - Advanced Learning Algorithms
  - Unsupervised Learning, Recommenders, Reinforcement Learning
- IoT Hardware Practical Course | *Iran Internet of Things Center*

Language Skills

English: Professional working proficiency

IELTS Band Score: **7.5** (L: 8.5, R: 8.5, S: 7.0, W: 6.5)

Farsi/Persian: Native proficiency

Turkish: Bilingual proficiency

Honors & Awards

- Ranked among the top 15% of class 2023 in School of Mechanical Engineering, University of Tehran
- Ranked among the top 0.3% of participants (164000 candidates) in the National University Entrance Exam, Been granted full tuition fee waiver for the course of study at University of Tehran

References

Dr. Aghil Yousefi-Koma	Professor, School of Mechanical Engineering, University of Tehran. Supervisor of CAST Research Center	aykoma@ut.ac.ir
Dr. Ehsan Hosseinian	Assistant Professor, School of Mechanical Engineering, University of Tehran	ehosseinian@ut.ac.ir
Dr. Ali Fahim	Assistant Professor, Faculty of Engineering Sciences, University of Tehran	a.fahim@ut.ac.ir