Hirsa Kia

Personal Website | LinkedIn | Github
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Philadelphia, PA - 19130, USA

EDUCATION

Temple University | Philadelphia, PA
Jan. 2023 - To date

PhD in Computer Science
GPA: 3.74/4.00

University of Tehran | Tehran, Iran
Sep. 2018 - Sep. 2022

MSc in Mechanical Engineering
GPA: 3.06/4.00

Islamic Azad University, Science and Research Branch | Tehran, Iran
Sep. 2013 - Sep. 2018

BSc in Mechanical Engineering

RESEARCH AND TEACHING EXPERIENCES

Temple University | Philadelphia, PA

Research Assistant
Jan. 2023 - To date

- Designing & Analyzing Intra-Body Networks:
  The goal of the project is to design Reconfigurable Intra-Body Networks, which use magnetic field as the communication medium, in order to track the chronic ailments such as Diabetes.

Teaching Assistant
Jan. 2023 - To date

- Program Design & Abstraction
- Intro to Web Technology & Programming

University of Tehran | Tehran, Iran

Research Assistant
Sep. 2018 - Sep. 2022

- Bipedal Locomotion on Uneven/Viscoelastic terrain
- State estimation and Sensor Fusion for Humanoid Robots

Teaching Assistant
Sep. 2018 - Sep. 2022

- Fuzzy Control Systems Design

Islamic Azad University | Tehran, Iran

Teaching Assistant
Jan. 2015 - May. 2015

- Mechanical Vibrations

SKILLS

Programming Languages

- Python
- C++
- Java
- Latex
- MATLAB
- HTML
- Julia

Selected Language Libraries

- PyTorch
- Scikit-learn
- CVXPY
- TensorFlow
- OpenAI Gym

PROJECTS

Reinforcement Learning

- Convergence Analysis of Linear TD Algorithm in State Aggregated Setting | Technical Report
- Implementing RL Functions using Python, Such as Q-Learning and Policy Iteration | Code
- Using OpenAI Gym Environments for Algorithm Testing, Such as DQN
- Inverted Pendulum RL Control using Bellman-Ford in Python

Machine Learning

- Macro-economy modelling problem using SINDyC algorithm | Code
- Complexity Analysis of Multi-Library SINDy Technical
- Feedforward Neural Network Design for Adsorption Process Regression Problem | Code
- Transfer Learning for CIFAR10 Dataset using VGG16
- Fine-tuning BERT Model for classifying CoLA Dataset
- Design CNN and MLP Architecture on MNIST Dataset using PyTorch and TensorFlow

Optimization

- Designing a Global Schedule for Intra-Body Network using a Greedy Approach
- Adaptive Controller with Gradient Approximation for Resonant Magnetic Induction Systems | Code
- Bayesian Optimization for Hyper-parameter Tuning of Adsorption Process ANN | Code
- Hyper-parameter Tuning of Adaptive Non-Singular Sliding Mode Control using GA and PSO | Code

Control System Design

- Adaptive Threshold Tuning in Sensor Networks for Efficient Communication using KF
- Humanoid Whole-Body Control for Viscoelastic Terrain
- Dynamics Analysis and Adaptive Non-Singular SMC Design for 6-DOF Robotic Manipulator | Code
- Dual Terminal Sliding Mode Controller for a 2-D Robotic Manipulator Control
- System Identification Algorithms (RLS, Kalman Filter, . . .) using MATLAB | Code
- Adaptive STR, MPC and APC control system design using MATLAB | Code
- MPC Design for Pendulum on a Cart and LQR using Python | Code
- Design, Modelling and Control of a Solenoid Actuator using Ansys Maxwell and MATLAB | Code
- Modelling and Control of Shape Memory Alloy actuator using fuzzy sliding mode controller

Others

- Branch prediction and pre-fetching simulations on CPU models using Gem5
- Secure and Responsive UI Design using HTML, MySQL and PHP | Code
- Design and Dynamic Analysis of Biomechanical Knee Joints

INDEPENDENT LEARNING

Udacity

- Reinforcement Learning
  Michael Littman & Charles Isbell
- Machine Learning
  Michael Littman & Charles Isbell
- Deep Learning using PyTorch
  Luis Serriano
- Machine Learning
  Sebastian Thrun
- Intro to Algorithms
  Michael Littman

edX

- Convex Optimization
  Stephen Boyd
- Sensor Fusion and Non-linear Filtering

DataCamp

- Deep RL in Python

Kaggle

- Intro to Game AI and RL
- Machine Learning
- Intro to Deep Learning
- Python

Publications

- Energy Efficient Communications for Intrabody Network Applications *In Progress*
- Centralized and Decentralized Energy Transfer Strategies in Wireless Intrabody Networks *In Progress*
- Multi-Library SINDy: A Computationally Efficient Framework for SINDy *In Progress*
- Introducing a Nonlinear Macroeconomic Model based on TE, SINDyC, and Phase Plane Analysis *Submitted*
  Computational Economics Journal
- A Study of Magnetic Resonance and Ultrasound based Through-the-body Communications *Accepted*
  WiMob 2024
- Autotuning of Resonant Magnetic Induction Communications *April 2024*
  DCOSS-IoT 2024, https://doi.org/10.1109/DCOSS-IoT61029.2024.00036
- Adsorption modeling of tetracycline removal by multi-walled carbon nanotube functionalized with aspartic acid and poly-pyrrole using Bayesian optimized artificial neural network *Feb. 2023*
  Journal of the Taiwan Institute of Chemical Engineers, https://doi.org/10.1016/j.jtice.2023.104743

EXTRACURRICULAR ACTIVITIES

Center for Advanced Systems and Technologies, University of Tehran | Tehran, Iran

Academic Affairs Manager *Sep. 2019 - Sep. 2022*

- Mentored and trained new student members in research methodologies and center protocols.
- Managed and coordinated academic tasks to streamline student involvement and optimize project execution.
- Managed academic tasks and analyzed performance data to support strategic planning.

Dynamics and Control Portfolio Co-manager *Sep. 2020 - Sep. 2022*

- Co-led the management of research portfolios in dynamics and control systems, ensuring alignment with project goals and timeline.
- Collaborated with cross-functional teams to drive the strategic research initiatives.
- Oversaw project budgets and researchers' hourly wages to ensure financial accuracy.

Taranom Student Charity | Tehran, Iran

Co-Founder and Executive Member *Sep. 2016 - Sep. 2018*

- Co-founded a student-led charity aimed at supporting children with cancer.
- Organized fundraising and awareness campaigns promoting the cause and secure donations.

TEST SCORES

TOEFL *Sep. 2021*

- **Overall**: 101, Reading: 29, Listening: 25, Speaking: 23, Writing: 24

GRE *Nov. 2021*

- **Overall**: 316, Verbal: 151, Quantitative: 165, Analytical Writing: 3