Hirsa Kia

Email | Personal Website | LinkedIn | Github

Philadelphia, PA - 19130, USA

Research Interests: Optimization, Reinforcement Learning, Theoretical ML

Education

- **Temple University** *Jan. 2023 - To date*
  PhD in Computer Science Philadelphia, PA
  - GPA: 3.74/4.00

- **University of Tehran** *Sep. 2018 - Sep. 2022*
  MSc in Mechanical Engineering Tehran, Iran
  - Thesis title: Design of a Humanoid Robot Locomotion on Soft Terrain
    GPA: 3.06/4.00

- **Islamic Azad University, Science and Research Branch (SRBIAU)** *Sep. 2013 - Sep. 2018*
  BSc in Mechanical Engineering Tehran, Iran
  - Capstone project: Development of a Fuzzy Control System for Servo-Motor Programming in Flexible Fixtures for Car Body Production

Experience

- **Temple University** *Jan. 2023 - To date*
  Research Assistant Philadelphia, PA
  - Design & Analysis of Intra-Body Networks
  - Analysis of Intra-body Communications Using Magnetic Resonant Circuits

- **Center for Advanced Systems and Technologies (CAST), University of Tehran** *Sep. 2018 - Sep. 2022*
  Research Assistant Tehran, Iran
  - Worked on robot state estimation and sensor fusion for SURENA V humanoid robot
  - Participated in the experimental phase of SURENA IV.
  - Experimented with nylon smart actuator.

  Academic Affairs Manager
  - Handling of the center's scientific output, (e.g. documentations, papers and theses)
  - Responsible for the academic meetings
  - Planned and executed the process of student application evaluation and interviews

  Assistant Dynamics and Control Team Manager
  - Analysis and research; reviewed and evaluated various papers and reports, prepared multiple research proposals
  - Writing skills; contribution in high standard report writing
  - Responsible for the staff meetings

Publications

- **Autotuning of Resonant Magnetic Induction Communications** *April 2024*
  DCOSS-IoT 2024, Link
- **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, Link
- **System Identification and Optimal PI Control for Nylon Smart Actuators** *April 2020*
  ISME 2020
- **A Study of Magnetic Resonance and Ultrasound based Through-the-body Communications** *Accepted*
  WiMob 2024
- **Introducing a Nonlinear Macroeconomic Model based on TE, SINDyC, and Phase Plane Analysis** *Under review*
  Computational Economics Journal
- **Proposing Multi-library SINDy Algorithm** *To be submitted*

Skills

- **Programming Languages:** Python, MATLAB, C++, HTML, Java, Julia, LaTeX
- **Selected Language Libraries:** PyTorch, TensorFlow, scikit-learn, OpenAI Gym
- **Operating Systems:** Windows, Linux

Teaching Experience

CIS1068 Program Design & Abstraction *Spring 2024*
Instructor: John Fiore Temple University
- Teaching Assistant

CIS1052 Intro to Web Tech. *Spring and Fall 2023*
Instructor: Justin Shi Temple University
- Teaching Assistant

Fuzzy Control Systems Design *Fall 2019*
Instructor: Aghil Yousefi-Koma University of Tehran
- Teaching Assistant

Mechanical Vibrations *Spring 2015*
Instructor: Farshad Kakavand SRBIAU
- Teaching Assistant

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

PROJECTS

- **Self-Study**
  - Convergence Analysis of Linear TD Algorithm in State Aggregated Setting (Technical Report)
  - Macro-economy modelling problem using SINDy algorithm
  - Feedforward neural network design for adsorption process regression problem
  - Hyper-parameter tuning of ANN using Bayesian optimization for adsorption process regression problem
  - Inverted Pendulum RL Control using Bellman-Ford in Python
  - Implementing RL Functions using Python, Such as Q-Learning and Policy Iteration
  - Using OpenAI Gym Environments for Algorithm Testing, Such as UCB in Multi-Armed Bandits
  - Hyper-Parameter Optimization of Adaptive Non-Singular Sliding Mode Controller using GA and PSO
  - Adaptive Non-Singular Sliding Mode Controller Design for 6-DOF Robotic Manipulator
  - Kinematics and Dynamics Analysis and Control System Design for 6-DOF Robotic Manipulator
  - Design CNN and MLP Architecture on Fashion MNIST Data using PyTorch and TensorFlow

- **Temple University**
  - Complexity Analysis of Multi-Library SINDy
    Course: Design & Analysis of Algorithms, Instructor: Alex Pang
  - Transfer Learning for CIFAR10 Dataset using VGG16
    Course: Machine Learning, Instructor: Slobodan Vucetic
  - Fine-tuning BERT Model for classifying CoLA Dataset
    Course: Machine Learning, Instructor: Slobodan Vucetic
  - Branch prediction and pre-fetching simulations on CPU models using Gem5
    Course: Computer Architecture, Instructor: Krishna Kant
  - Design of an Energy-Efficient Capacitive Tuning Scheme for Magnetic Resonance Coupling
    Course: Independent Study, Instructor: Krishna Kant
  - Secure and Responsive UI Design
    Course: Scripting for Business and Science, Instructor: Justin Shi

- **University of Tehran**
  - Humanoid Whole-Body Control for Viscoplastic Terrain
    Thesis, Instructor: Aghil Yousefi-Koma
  - Dual Terminal Sliding Mode Controller for a 2-D Robotic Manipulator Control
    Course: Adaptive Control System, Instructor: Mousa Ayati
  - System Identification Algorithms (RLS, Kalman Filter, . . .) using MATLAB
    Course: Adaptive Control System, Instructor: Mousa Ayati
  - Adaptive STR, MPC and APC control system design using MATLAB
    Course: Adaptive Control System, Instructor: Mousa Ayati
  - MPC Design for Pendulum on a Cart and LQR using Python
    Course: Modern Control Systems, Instructor: Mohammadreza Haeri-Yazdi
  - Design, Modelling and Control of a Solenoid Actuator using Ansys Maxwell and MATLAB
    Course: Mechatronics, Instructor: Ali Sadighi
  - Modelling and Control of Shape Memory Alloy actuator using fuzzy sliding mode controller
    Course: Smart Structures, Instructor: Aghil Yousefi-Koma
  - Modelling and control of ABS system using Fuzzy-PID Controller
    Course: Fuzzy Control Systems Design, Instructor: Aghil Yousefi-Koma