Kiana Asgari

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Home Page

Research Interests

Reinforcement Learning, Online Sequential Decision Making and Interpretable Machine Learning.

Education and Honors

Sharif University of Technology ,Tehran, Iran 2018–Current
B.Sc. in Computer Science and Mathematics (Double major)
GPA: 19.00/20.00

University Entrance Examination (Konkur), Iran 2018
Ranked 217 among more than 200,000 participants (top 0.1 %) in the nationwide university entrance exam for STEM majors.

Member of Iran's National Elites Foundation **(INEF)**

Research Experience

Max Plank Institute for Software Systems (MPI-SWS), Saarbrücken, Germany Feb.–Aug. 2023
- Research Intern under the supervison of Prof. Adish Singla
- Studying the difficulty of an RL task from an algorithm-Agnostic point of view
- Implementing a reward shaping benchmark for sparse RL tasks

Bachelor Project (as a team of two) ongoing
- Supervisor: Dr. Mojtaba Tefagh
- Tackeling the Bitcoin blockchain scalability issue with Reinforcement Learning methods.
- Lead Author of the under-review resulted paper.

Course Projects

- Bayesian Neural Network for deep learning users

  Based on the work of L. Jospin
  Supervisor: Dr. Yassaee.

- How to Construct Constant-round Zero-Knowledge Proof Systems for NP

  Based on the work of O. Goldreich
  Supervisor:Dr. Khazaei.

- Gas Simulation

  Simulation of gas molecules collision using Java Swing

- Chicken Invaders Simulation

  Implementing Multiplayer Game with Java Socket Programming

- LP Solver

  Implementing LP Barrier Method with infeasible start Newton Method using DCP programming
  Supervisor: Dr. Tefagh

- Agnostic Federated Learning

  Based on the work of M. Mohri
  Supervisor:Dr. MaddahAli

Relevant Courses

- **Machine Learning Theory** (Graduate Course) 20/20
  PAC learning, VC dimension, Rademakher Complexity, Kernel Methods, Boosting, Online Learning, Clustering, and Dimension Reduction. Based on 'Understanding Machine Learning: From Theory to Algorithms, Shai'
- **Deep Learning** (Graduate Course.) 18.6/20
  Backpropagation, CNN, RNN, Auto Encoders, GAN, VAE, Embeding, Attention Models, Transformers, and Deep RL. Based on 'Deep Learning, Ian Goodfellow'.
- **High Dimensional Probability** (Graduate Course) 19.7/20
  Tail and Concentration, Suprema, Gaussian Processes, Empirical Processes, Sub-Gaussian and Sub-Exponential Distributions, Random Matrices, and Chaining. Based on 'Probability in High Dimension, Van Handel.'
- **Convex Optimization** (Graduate Course) 20/20
  Convex Set, (Quasi)Convex Function, Optimization Problems, Duality, Gradient Descent, Steepest Descent, Newton's Method, and Interior Point Methods. Based on 'Convex Optimization, Boyd.'
- **Information Theory** (Undergraduate & Graduate) ongoing
  Elements, Data compression, Channel Capacity, and Gaussian Channel. Based on 'Elements of Information Theory'.
- **Stochastic Processes** (Undergraduate & Graduate) 18/20
  Markov Chain, Mixing Time, MCMC, and Probabilistic Models.
- **Other Courses**:
  Introduction to Cryptography(20/20), Design and Analysis of Algorithms (20/20), Data Structures(18.7/20), Advanced Programming(20/20), Linear Algebra(18.7/20), Mathematical Analysis1(20/20), Topology(20/20), Linear Optimization(18.5/20), Algebra 1&2(18.5/20), Numerical Analysis(20/20), Probability and Applications(20/20).

Other Experiences

Attending *CMMRS school* at Max Planck Institute (MPI-SWS). Summer 2021

Teaching Assistant, Convex Optimization, Prof. Yassaei
Teaching Assistant, Applied Linear Algebra, Prof. Tefagh
Teaching Assistant, Probability and Applications , Dr. Barzegar

Skills

- **Programming Languages:** Java, Python, Julia, C++, MATLAB.
- **Python Libraries:** PyTorch, TensorFlow, CVXPY, Socket.
- **Web:** HTML, CSS.

Languages

- **Persian:** native
- **English:** fluent

Refrence

Dr. Mojtaba Tefagh
Assistant Professor
Department of Mathematical Sciences
Sharif University of Technology
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