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Ali Banaei

Education

2021–Present **Master of Machine Learning**, *KTH Royal Institute of Technology*, Stockholm.
- GPA: 4.88 / 5

2016–2020 **Bachelor of Computer Engineering**, *Sharif University of Technology*, Tehran.
- GPA: 17.97/20 (19.1/20 in last two years)

2012–2016 **Diploma in Mathematics and Physics**, *Sayyed Razi High School(Sampad)*, Tehran.
- GPA : 19.70/20

Research Interests

Statistics, Machine Learning, Computational Biology.

Honors & Awards

2016-08 **Iranian University Entrance Exam**, 47th place among students in Iranian University Entrance Exam(Konkur).

2020-05 **Offered A Tuition-Free Master's Program as an Excellence Award**, Sharif University of Technology, (Exempt from Nationwide Master's Entrance Exam).

Research Experiences

2022-present **Spatial Transcriptomics Data Integration and Analysis using Machine Learning Methods**, *ICB Institute of Computational Biology*, Helmholtz Center, Munich.
Interpretable integration and analysis of transcriptomics data using multimodal generative modeling in Prof.Theis group working with Dr. Mohammad Lotfollahi.

2018-2020 **Applications of Deep Learning in Communication**, *Sharif University of Technology*, INL Lab.
Researching the intersection of Machine Learning and Computer Networks under supervision of Dr.Jafari. Our work was concerned with enhancing the quality of data transmission, in particular images, through noisy networks using machine learning methods.

Publications

2020 Estiri A, Sabramooz M, Banaei A, Dehghan A, Jami B, Jafari M. **"A Variational Auto-Encoder Approach for Image Transmission in Noisy Channel"**, *International Symposium on Telecommunications 2020*, Contributed to the implementation of the VAE model. Also, responsible for improving the quality of images using Perception-based Image Quality Assessment Metrics.
https://ieeexplore.ieee.org/abstract/document/9345813

Relevant Courses

Fall 2018 **Artificial Intelligence**, *20 / 20*.

Spring 2019 **Introduction to Bioinformatics**, *20 / 20*.

Spring 2020 **Machine Learning in Bioinformatics**, *19.8/20*.

Fall 2021 **Advanced Machine Learning**, *B*.

Fall 2021 **Statistical Methods in Applied Computer Science (Bayesian Inference and Monte Carlo Methods)**, *A*.

Fall 2021 **Probabilistic Graphical Models**, *A*.

Fall 2021 **Artificial Neural Networks and Deep Architectures**, *B*.

Spring 2022 **Deep Learning in Datascience**, *A*.

Fall 2022 **Mathematical Modeling of Biological Systems**, *A*.

Fall 2022 **Deep Learning Advanced Course**, *A*.

Fall 2022 **Reinforcement Learning**, *Ongoing*.

Spring 2022 **Regression Analysis**, *Ongoing*.

Spring 2022 **Time Series Analysis**, *Ongoing*.

Spring 2022 **Machine Learning Theory**, *Ongoing*.

Computer Skills

Advanced Python, Java, C, Python Machine Learning and Data Analysis Tools(Keras/TensorFlow, Pytorch, Pandas, Numpy, Scikit-Learn, Scipy, Jax), LaTeX

Familiar R, Julia, C++, MySQL, Git, Django, HTML, CSS, bash

Languages

English *Advanced*

Persian *Mother Tongue*

Teaching Experiences

January–June 2017 **Teacher Assistant of Advanced Programming**, *Sharif University of Technology*, Tehran.

September–December 2019 **Teacher Assistant of Computer Networks**, *Sharif University of Technology*, Tehran.

January 2020–June 2020 **Teacher Assistant of Computer Networks**, *Sharif University of Technology*, Tehran.

January 2020–June 2020 **Teacher Assistant of Embedded Systems Design**, *Sharif University of Technology*, Tehran.

September 2020–December 202 **Teacher Assistant of Game Theory**, *Sharif University of Technology*, Tehran.

Course Projects

2018–2019 **Microarray Data Analysis**, *Sharif University of Technology*.
Introduction to Bioinformatics

2018–2019 **Analysis of Visual Features for Cortical Complex Cells**, *Sharif University of Technology*.
Foundations of Neuroscience

2019–2020 **Drug-Target Binding Affinity Prediction Using Deep Learning**, *Sharif University of Technology*.
Machine Learning in Bioinformatics

2021–2021 **IWAE and VAE Implementation and Comparison**, *KTH Royal Institute of Technology*.
Advanced Machine Learning

2021–2021 **MoE vs PoE: Comparing different methods of combining modalities in multimodal variational autoencoders**, *KTH Royal Institute of Technology*.
Advanced Machine Learning

2021–2021 **Deep Learning interpretability and Concept Transformers**, *KTH Royal Institute of Technology*.
Deep Learning, Advanced Course