Elyas Heidari

Curriculum Vitae

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https://elihei.github.io
EliHei

Educational Background

2015 **BSc Mathematics and Applications**, *Department of Mathematical Sciences - Sharif University of Technology (SUT)*.

2014 **BSc Computer Engineering**, *Department of Computer Engineering - Sharif University of Technology*.

2010 – 2014 **Diploma Mathematics and Physics**, *Hashemi-Nezhad High school of Exceptional Talents*.

Research Interests

- Biostatistics
- Machine Learning
- Data Science
- Computational Biology
- Statistical Computing

Research Experiences

European Molecular Biology Laboratory (EMBL)

Huber Group, Multi-omics and Statistical Computing

Role Research Trainee

ADVISORS Dr. Laleh Haghverdi, Dr. Junyan Lu, Dr. Wolfgang Huber

07/18-10/18 **Multi-omics Statistical Analysis of Chronic Leukemia Lymphoma (CLL)**

Collaboration **Zenz Lab, National Center for Tumor Diseases (NCT)**

Keywords Cancer Multi-omics, Biological Discovery, Survival Analysis, Pathway Analysis, Visualization

Contribution Proposed Hypoxia as the signature of TP53ness based on comprehensive multi-omics analysis.

07/18-10/18 **Network-Based Metric on Single-cell Transcriptomics**

Keywords Statistics of Single-cell, Stochastic Processes, Probabilistic Graphical Model (PGM), Graph Theory

Contribution Defined a network-based metric using PGMs and random walk on graphs which shows to be significantly more robust than cosine and Euclidean metrics.

Sharif University of Technology

bAIo-lab, Biomedical Informatics and Artificial Intelligence

Role Research Fellow

ADVISOR Dr. Ali Sharifi-Zarchi

01/18- **Prediction of Non-ribosomal Peptide Synthetase Substrates**

Collaboration **Mohimani Lab, Carnegie Mellon University (CMU)**

Keywords Deep Learning, Semi-supervised Learning, Drug Design

Contribution Developed an end-to-end multi-task learning module for semi-supervised learning of biological sequences.

04/17- **Comprehensive Statistical Analysis of Health Surveys**

Collaboration **Cardiovascular Research Center, Shahid Sadoughi Hospital**

Keywords Statistical Computing, Health Survey Data Analysis, Knowledge Discovery

Contribution Introduced an end-to-end workflow for Health Survey data analysis.

03/17-10/17 **Investigating Role of PIN1 in Alzheimer's Disease (AD) Progression**

Collaboration **Department of Brain and Cognitive Sciences, Royan Institute**

Keywords Multi-omics, Biological Discovery, Exploratory Data Analysis

Contribution Introduced 4 candidate micro-RNAs as novel therapeutic targets for AD.

Bioinformatics Research Lab

Role Research Assistant

ADVISOR Dr. Abolfazl Motahari

04/17-10/17 **Functional Brain Connectivity for Behavioural Genetics**

Keywords Probabilistic Graphical Models, Behavioural Genetics, Compressed Sensing, fMRI Data Analysis

10/16-04/17 **Genome-wide Association Study (GWAS) to Design a Genotype-Phenotype Association Predictor**

Keywords High-dimensional Statistics, Statistical Learning, Population Study

07/16-10/16 **Decomposing Protein-protein Interaction Networks**

Keywords Systems Biology, Graph Theory, Algorithmic Bioinformatics

Teaching Assistance

CE@SUT Fundumenetals of Programming, Advanced Programming (2), Engineering Probability and Statistics (5), Bioinormatics (2), Advanced Bioinformatics, Discrete Structures, Stochastic Processes, Optimization for Artificial Intelligence, Introduction to Linear Algebra

Math@SUT Probability and Applications, Statistics and Applications, Stochastic Processes

EE@SUT Computational Genomics

Related Courses

Computer Engineering

Advanced Programming: 19/20
Engineering Probability and Statistics: 19.7/20
Bioinformatics : 20/20
Large-scale Biological Data Analysis: 20/20
Analysis and Design of Information Systems: 19.2/20
Discrete Structures: 18/20
Database Design: 17.2/20

Mathematics

Differential Equations: 19.4/20
Stochastic Processes: 18.9/20
Statistics and Applications: 19/20
Linear Algebra: 17.2/20
Topics in Statistics: 18/20
Game Theory: 19.9/20
Mathematical Biology: 18/20
Non-linear Optimization: 18/20
Data Analysis: 20/20

Publications

Pin1 Regulatory miRNAs as Novel Candidates for Alzheimer's Disease Treatment
E. Heidari, E. Salehi Siavashani, M. Rasooli, A. Sharifi-Zarchi, K. Shahpasand
Submitted to the Journal of Neuroscience (bioRxiv preprint)

Multivariate Analysis and Visualization with R Package muvis
E. Heidari, V. Balazadeh-Meresht, A. Sharifi-Zarchi
Submitted to the Journal of Statistical Software (arXiv preprint)

Novel Findings in Combrehensive Statistical Analysis of The Yazd Health Survey (YaHS)
E. Heidari, V. Balazadeh-Meresht, N. Ahmadi, A. Sharifi-Zarchi, M. Mirzaei, M. Sadr-Bafghi
Will be Submitted to Nature Communications

Software Development

muvis Multivariate Analysis and Visualization in **R** (muvis documentation)

SeqLearner Multitask Learning for Biological Sequences (GitHub repository)

Skills

Programming Extensively experienced in **Python** (machine/deep learning and algorithmic programming), **R** (data analysis and visualization), **Java** (software development), and **Bash** (system programming).

Other Activities

bAIo-lab@CE@SUT Leader of the Statistical Methods and Data Science Group

CE@SUT Member of Board in Students' Scientific Chapter (SSC)

Founder and Scientific Director of interna 2018

Scientific Director of First Series of Data Challenge Competition