

Education

University of California, Los Angeles (UCLA)

Los Angeles, USA

PH.D. IN COMPUTER SCIENCE

Sep. 2017 - Dec. 2023

- Thesis: Efficient Representation Learning for Longitudinal Data in Healthcare Applications

University of California, Los Angeles (UCLA)

Los Angeles, USA

M.SC. IN COMPUTER SCIENCE (GPA: 3.98/4.00)

Sep. 2017 - Mar. 2020

- Relevant Courses: Natural Language Processing, Probabilistic Graphical Models, Bayesian Networks, Deep Learning Topics

Sharif University of Technology (SUT)

Tehran, Iran

B.SC. DOUBLE MAJOR IN COMPUTER SCIENCE AND ELECTRICAL ENGINEERING (GPA: 3.9/4.0)

Sep. 2012 - June 2017

- Thesis [CS]: Semi-supervised indoor layout estimation from RGB images
- Thesis [EE]: Cuff-less blood pressure estimation from face videos
- Relevant Courses: Computer Vision, Image Processing, Information Theory, Stochastic Processes, Statistics

Skills

Languages

Python, MATLAB, Dart, Java, R, C/C++, HTML/CSS, Javascript, SQL, Verilog

Deep Learning

PyTorch, FuncTorch, Jax, Langchain, Huggingface, AllenNLP, PyG, MMDet, MMSeg, MMCV, OpenCV, tsAI, SoloLearn

Large-scale Training and MLOps

ONNX, Triton, TensorRT, FSDP, ZeRO 1-3, DeepSpeed, NCCL, Familiar with Kubernetes and Slurm

Development/OS

Flutter, Flask, Docker, Linux

Visualization

D3.js, Seaborn, Plotly, Matplotlib, KNIME, Dundas BI

Selected Projects

GPTrials

Zero/few-shot patient-centered perusing of clinical trials leveraging emergent knowledge in Large Language Models (**LLMs**) [*PyTorch, Langchain, FAISS, Huggingface, Flask*]-[**demo-v1/manuscript**]

Marrovision

Large-scale training library for deep learning-based cell morphology recognition for hematopathology [*PyTorch, solo-learn, PML*]-[**code/paper**]

Olivia

A group of projects on pandemic analytics including surveillance app, analytics framework, dataset, and social media analytics. [**code/paper/award**]

LNLLab

Robust training in the presence of label noise considering dataset partitioning, gradient pruning, contrastive learning and label refinement. [**code**]

Tabluence

Multi-modal longitudinal data representation, supporting early/late fusion, adversarial information removal, and contrastive self-supervised objectives. [**code**]

Experience

eHealth and Data Analytics Lab

Los Angeles, USA

GRADUATE STUDENT RESEARCHER

Sep. 2017 - Present

- Research Topics: **Medical Imaging, Self-supervised Learning, Time-Series, Multi-modal Learning, HealthAI**
- Participated in **NeurIPS 2022's** Large-scale Graph Challenge (OGB-LSC) with NVIDIA, specializing in **graph representation learning** via attention modeling and Transformer-based architectures. Achieved **2nd place** in the competition. [*pytorch, pyg, dgl, rdkit*]
- Conducted diagnosis prediction and **unsupervised representation learning** for whole slide cell images using deep learning. Project in collaboration with the UCLA Department of Pathology. [*pytorch*]
- Designed a **self-supervised** spatio-temporal pattern embedding pipeline for monitoring and predictive modeling of pandemic outcomes, leveraging exogenous variables. Collaborated with UCLA School of Public Health, Howard University, and the CDC Foundation. [*pytorch*]
- Developed models for non-intrusive monitoring of anxiety and stress via **multi-modal fusion** and predictive modeling of time-series and longitudinal records. Project funded by MITRE Corp, Department of Veteran Affairs, and CISCO. [*pytorch*]

CliniComp, Intl.

San Diego, USA

ARTIFICIAL INTELLIGENCE INTERN

Summer 2019, Summer 2020

- Research Topics: **Unsupervised Learning, Universal Patient Representation, Note Generation**
- Created a transformer-based pipeline for an auto-complete tool for doctors' notes. Also designed a demo interface to showcase the tool's capabilities. [*tensor2tensor, tensorflow, pytorch, flask*]
- Developed an **unsupervised pre-training** method for universal patient representations, effectively improving septic-shock prediction as a downstream task. The system involved the fusion of multi-modal record sequences and transformers trained via **contrastive training**. [*pytorch*]
- Created toolkits and a web app interface for visualization, statistical tests, and comparison of high-dimensional data from different hospitals, enabling efficient domain-shift analysis for pre-trained models. [*sci-kit learn, flask*]

Computer Vision Lab, Learning and Intelligent Systems Lab, SUT

Tehran, Iran

UNDERGRADUATE STUDENT RESEARCHER

Sep. 2015 - June 2017

- Research Topics: **Self-supervised Computer Vision, HealthAI**
- Developed a fully-convolutional model for indoor-layout estimation using orientation labels computed from a depth dataset (semi-supervised). [*MATLAB, Caffe, PCL*]
- Created a synchronized dataset of 120Hz videos with a blood pressure system for ground truth values. Developed an algorithm for blood pressure estimation using constrained neural local fields, iPPG values, and Eulerian video magnification. [*MATLAB, OpenCV, sci-kit learn*]

Peer Reviewing

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| Jour. | IEEE Transactions on Artificial Intelligence , Reviewer | TAI |
| Jour. | Journal of Biomedical Health Informatics , Reviewer | JBHI |
| Jour. | IEEE Transactions on Sustainable Computing , Reviewer | TSUSC |
| Jour. | Journal of Medical Internet Research , Reviewer | JMIR |
| Conf. | ACM Conference on Health, Inference, and Learning , Reviewer | CHIL |
| Conf. | IEEE INTERNATIONAL CONFERENCE ON OMNI-LAYER INTELLIGENT SYSTEMS , Reviewer | COINS |
| Conf. | IEEE International Conference on Acoustics, Speech and Signal Processing , Reviewer | ICASSP |

Teaching

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|------|--|--------------------|
| UCLA | Introduction to CS (CS31 - C++ Programming) , Teaching Fellow | Su23 |
| UCLA | Algorithm Design (CS180) , Teaching Fellow | F18, F19 |
| UCLA | Digital Design Laboratory (CS152A) , Teaching Fellow | W19, S19, S20, S21 |

Research & Publications (Google Scholar)

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| 2023 | A Self-supervised Framework for Improved Data-Driven Monitoring of Stress via Multi-modal Passive Sensing , Fazeli, S., Levine, L., Beikzadeh, M., Mirzasoleiman, B., Zadeh, B., Peris, T., Sarrafzadeh, M. | IEEE-ICDH |
| 2023 | Beyond Labels: Visual Representations for Bone Marrow Cell Morphology Recognition , Fazeli, S., Samiei, A., Lee, T. D., Sarrafzadeh, M. | IEEE-ICHI |
| 2022 | Passive Monitoring of Physiological Precursors of Stress Leveraging Smartwatch Data , Fazeli, S., Levine, L., Beikzadeh, M., Mirzasoleiman, B., Zadeh, B., Peris, T., Sarrafzadeh, M. | IEEE-BIBM |
| 2022 | Heterogenous Ensemble of Models for Molecular Property Prediction , Darabi S, Fazeli, S, Liu J, Milesi A, Morkisz P, Puget JF, Titericz G. | NeurIPS OGB-LSC |
| 2021 | Statistical Analytics and Regional Representation Learning for COVID-19 Pandemic Understanding , Fazeli, S., Moatamed, B., Sarrafzadeh, M. | IEEE-ICHI |
| 2021 | Contrastive Mixup: Self-and Semi-Supervised learning for Tabular Domain , Darabi, S., Fazeli, S., Pazoki, A., Sankararaman, S., Sarrafzadeh, M. | ArXiv |
| 2021 | COVID-19 and Big Data: Multi-faceted Analysis for Spatio-temporal Understanding of the Pandemic with Social Media Conversations , Fazeli, S., Zamanzadeh, D., Ovalle, A., Nguyen, T., Gee, G., Sarrafzadeh, M. | ArXiv |
| 2021 | Unsupervised Acute Intracranial Hemorrhage Segmentation With Mixture Models , Kärkkäinen K, Fazeli S, Sarrafzadeh M | IEEE-ICHI |
| 2021 | Adequacy of Existing Surveillance Systems to Monitor Racism, Social Stigma and COVID Inequities: A Detailed Assessment and Recommendations , Ford CL, Amani B, Harawa NT, Akee R, Gee GC, Sarrafzadeh M, Abotsi-Kowu C, Fazeli S, Le C, Nwankwo E, Zamanzadeh D | IJERPH |
| 2021 | A Framework for Neural Topic Modeling of Text Corpora , Fazeli S, Sarrafzadeh M | ArXiv |
| 2020 | Taper: Time-aware patient ehr representation , Darabi, S., Kachuee, M., Fazeli, S., Sarrafzadeh, M. | JBHI |
| 2020 | Anxiety Detection Leveraging Mobile Passive Sensing , Levine LM, Gwak M, Kärkkäinen K, Fazeli S, Zadeh B, Peris T, Young AS, Sarrafzadeh M | EAI-BAN |
| 2020 | A Flexible and Intelligent Framework for Remote Health Monitoring Dashboards , Fazeli S, Sarrafzadeh M | ArXiv |
| 2019 | EXTRA: Exercise Tracking and Analysis Platform for Remote-monitoring of Knee Rehabilitation , Gwak, M., Fazeli, S., Ershadi, G., Sarrafzadeh, M., Ghodsi, M., Aminian, A., Schlechter, J. A. | IEEE-BSN |
| 2019 | Group-Connected Multilayer Perceptron Networks , Kachuee, M., Darabi, S., Fazeli, S., Sarrafzadeh, M. | ArXiv |
| 2018 | Children activity recognition: Challenges and strategies , Hosseini, A., Fazeli, S., van Vliet, E., Valencia, L., Habre, R., Sarrafzadeh, M., Bui, A. | IEEE-EMBC |
| 2018 | Ecg heartbeat classification: A deep transferable representation , Kachuee, M., Fazeli, S., Sarrafzadeh, M. | IEEE-ICHI |