

Zeinabsadat Saghi

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Education

2023 - **University of Southern California.**
Present Doctor of Philosophy - PhD, Computer Science
Supervisor: Prof. Souti Chattopadhyay

2017-2022 **Sharif University of Technology.**
Bachelor of Science - BS, Computer Engineering
Thesis project: Multi-Domain Image Classification Under Domain Shift

Interests

Brain-Computer Interface, HCI, Cognitive Science, Deep Learning, Neural Engineering

Awards

UC Davis Graduate School Fellowship for 2022

Research Experience

2021-2022 **Research Assistant**, *Image Processing Lab (IPL), Department of Computer Engineering at Sharif University of Technology*, Supervisor: Prof. Kasaei.

Conducted groundbreaking research to enhance deep neural network performance under domain shift, contributing to advancements in multi-domain image classification.

- Innovative Algorithm Development: Devised a novel gradient surgery algorithm, elevating multi-domain image classification accuracy by 2-3% above baseline.
- Generalizing Framework: Developed a versatile PyTorch-based framework for multi-objective tasks, showcasing adaptability across diverse applications.
- Practical Applicability: Validated method effectiveness in various tasks, highlighting its applicability and real-world impact.

2021 **R&D Intern**, *AI-Med Company*.

Breast Cancer Detection using Mammography Images.

- Mammography Screening with Deep Learning: Developed and maintained PyTorch models for breast cancer screening using mammography images, improving early detection.
- Lesion Detection Expertise: Implemented binary classification and image segmentation techniques for precise cancerous lesion detection, enhancing accuracy.

2021 –2022 **Research Assistant**, *Data Science and Machine Learning(DML) Lab, Department of Computer Engineering*, EEG-based Personalized Interpretable Visual Attention Prediction, Supervisor: Prof.Rabiee.

- Advanced EEG Signal Analysis: Collaboratively developed RNN models (PyTorch, TensorFlow) to extract attention maps from EEG signals, contributing to personalized and interpretable visual attention prediction.
- Integrated Gaze-Attention Approach: Spearheaded a collaborative effort to engineer a novel pipeline integrating gaze estimation for enhanced attention prediction using an attention-based autoencoder.

This collaborative research contributed to the field by combining EEG signal analysis with gaze estimation for improved visual attention prediction.

Research Project

2022-2023 **Research Assistant**, *Motion Capture Lab, Department of Computer Science, UC Davis*, **Topic:** EAGER: Building a Foundation for Hands-on STEM Learning at a Distance.

Supervisor: Prof. Neff

Contributed to a groundbreaking research project at UCD focused on autonomous pedagogical agents. Successfully executed the first phase by designing and implementing a VR environment application to collect a comprehensive data corpus. Captured interactions between expert facilitators and diverse learners, laying the groundwork for the project's long-term objectives.

Teaching Experience

2023 **Teaching Assistant**, *Introduction to Artificial Intelligence*.

Instructor: Prof. Rajati

2022-2023 **Teaching Assistant**, *Computer Animation*.

Instructor: Prof. Neff

2022 **Teaching Assistant**, *Machine Learning*.

Instructor: Prof. Peyvandi

2022 **Teaching Assistant**, *Computer Simulation*.

Instructor: Prof. Peyvandi

2021 **Teaching Assistant**, *Artificial Intelligence*.

Instructor: Prof. Rohban

2020-2021 **Teaching Assistant**, *Digital System Design*.

Instructor: Prof.Baharvand

Course Projects

- Computational Story telling **Exploring Techniques to Generate Dialogues in Hogwarts Legacy Game Using LLMs, *Github*.**
We fine-tune pre-trained GPT-2 (124M) model on Harry Potter Dialogue dataset to incorporate characters' attributes, relations, context, and dialogue history, such that we can generate creative and Harry-Potter-like dialogues for Hogwarts Legacy video game. We compare the results of this model with pre-trained GPT-2 (775M) and ChatGPT in terms of fluency, relevance to scene, relevance to attributes, and relevance to relations.
- Machine Learning **Sarcasm Detection, *Colab*.**
this project aimed to detect sarcasm on the Twitter dataset. In this project, I employed various preprocessing and indexing methods on text data and different models for classification.
- Machine Learning **Covid-19 patients condition prediction, *github*.**
this project aimed to detect early prediction of a Covid-19 patient by using deep learning and feature extraction methods.
- Artificial Intelligence **Image classification by MLP , SVM, *github*.**
In this course during several projects, the performance of different classifiers on image dataset(MNIST) was investigated. Classifiers like Multilayer Perceptron and Support Vector Machine.
- Artificial Intelligence **Diabetes Diagnosis by decision tree prediction, *github*.**
In this project, the decision tree was implemented and the diagnosis of diabetes was made with the help of a small dataset.

Skills

- Programming Python, C, C++, Java, MySQL, R, Matlab
Tools PyTorch, Tensorflow, Keras, NumPy, SciPy
Environment Latex, Unity, Maya
Web/Mobile HTML, JavaScript, CSS, Django, Android, IOS

Relevant Courses

- 2022 **Computational Story Telling, Instructor: Joshua Mccoy , A.**
2022 **Machine Learning and Discovery, Instructor: Prof.Pirsiavash, A.**
2022 **Applied Numerical Linear Algebra, Instructor: Prof.Gygi, A-**
2021 **Signals and Systems, Instructor: Prof.Manzuri, 19.1/20.**
2021 **Machine Learning, Instructor: Prof.Hosseini, 18.3/20.**
2020 **Artificial Intelligence, Instructor: Prof.Abdi, 20/20.**
2020 **Modern Information Retrieval, Instructor: Prof.Beigi, 17.3/20.**

Voluntary Activities

- 2021-2022 **Head of Sharif Cognitive Science Community (Shenasa)**, *Sharif University of Technology*.
Responsible for holding seminars and workshops on cutting-edge topics in sub-fields of Cognitive Science specially Neuroscience and Artificial Intelligence
- 2019 **Director of Brain and Cognitive Science Seminar**, *Sharif University of Technology*,
Janury 2019- April 2019.
- 2019-2020 **Head of branding team at "Winter Seminar Series 2020"**, *Sharif University of Technology*.