Nikasadat Emami

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EDUCATION

New York University **Sep 2023 – present**
Ph.D. in Electrical Engineering *New York City, USA*
- GPA: 4/4

University of Tehran **Sep 2019 – Jun 2023**
B.Sc in Electrical Engineering *Tehran, Iran*
- GPA: 18.78/20 (3.89/4)

Farzanegan1 Highschool (NODET) **Sep 2016 – Jun 2019**
Highschool Diploma, Mathematics *Tehran, Iran*
- GPA: 19.88/20 (4/4)

RESEARCH INTERESTS

- Deep Learning
- Brain-Computer Interface
- Computer Vision
- Natural Language Processing
- Speech Decoding

HONORS AND AWARDS

- Received the School of Engineering (SoE) **PhD Fellowship** at NYU Tandon School of Engineering for the year 2023/2024
- Ranked **3rd** among 120 Electrical Engineering B.Sc. students, class of 2023, University of Tehran.
- Ranked **1st** in control engineering, University of Tehran.
- Member of the National Organization for Development of Exceptional Talents **(NODET)**
- Ranked among **the top 0.2%** in approximately 165,000 participants in the Nationwide Iranian Universities Entrance Exam, 2019.
- **Awarded first** in KAFAA (Iran Physics Cup) tournaments held in Shahid-Beheshti University, Tehran, April 2017.
- **Awarded first** in PYPT (Persian Young Physicists' Tournaments) held in Kharazmi University, Tehran, February 2017.

RESEARCH EXPERIENCE

PhD Research **Sep 2023 - present**
- Leveraging deep learning to decode Electrocorticographic (ECoG) signals to enable communication for individuals with speech impairments, contributing to the advancement of brain-computer interface (BCI) technologies
- Introducing a brain decoding method for analyzing fMRI responses to visual perception using a dataset of natural scenes, where the visual features of images extracted from deep neural networks are used as the decoding targets.

Undergrad Internship **Jul 2022 - Sep 2022**
- Generation of a dataset of handwritten Persian words by applying Generative Adversarial Networks (GANs) to a dataset of typed Persian words, initially extracted by using a YOLOv5 model on typed documents.

SKILLS

Programming Languages: Python, C/C++, MATLAB, Verilog, R, LaTeX

Frameworks & Libraries: PyTorch, TensorFlow, scikit-learn, Pandas, NumPy, Simulink

Hardware & System Design: STM32Cube, ModelSim, Intel Quartus Prime, NI Multisim

RELEVANT COURSES

- **Deep Learning** (A)
- **Machine Learning** (A)
- **Image and Video Processing** (A)
- **Stochastic Processes** (A)
- **Probability & Statistics** (18.49/20)
- **Intelligent Systems** (20/20)
- **Data Structures & Algorithms** (18.1/20)
- **Digital Signal Processing** (A)
- **Signals & Systems** (16.4/20)
- **Linear Algebra** (20/20)
- **Computer Networks** (18/20)
- **Operational Research** (19.36/20)

CERTIFICATIONS

- Neural Networks & Deep Learning - Coursera
- Deep Neural Networks with PyTorch - IBM
- Convolutional Neural Networks - Coursera
- Deep Learning Specialization - DeepLearning.AI
- Build Better GANs - Coursera
- Structuring Machine Learning Projects - Coursera

RELATED COURSE PROJECTS

Machine Learning:

- **Speech Emotion Recognition** by using different supervised and unsupervised machine learning models.
- **EEG Signal Processing** with different supervised machine learning techniques.
- Developed different supervised machine learning models like **SVM, KNN, Parzen Window, Decision Tree, MLP, Logistic Regression,Ensemble Learning,** and **Optimal & Naive Bayes Classifiers** in Python.
- Developed different unsupervised machine learning models like **GMM, SFS, SBE**, and **PCA** models in Python.

Deep Learning:

- Trained a **ConvNet** to classify six sign language digits in Tensorflow and Keras.
- Implemented a **U-Net** for Semantic Segmentation.
- Used **transfer learning** on a pre-trained **MobileNet** for binary image classification.
- Implemented **Neural Style Transfer** with the pre-trained **VGG19** model in TensorFlow.
- Modified pre-trained word embedding models like **GloVe** and **Word2Vec** to perform word analogies.
- Implemented a **Neural Machine Translation** with **attention models** in Tensorflow and Keras.
- Implemented a **Trigger Word Detection** model with **GRU** and unidirectional **LSTM** networks in Tensorflow.
- Trained a **transformer model** with **attention layers** in TensorFlow.

Data Structures & Data Analysis:

- Implemented different **graph theory** problems like **DFS** , and **BFS.**
- Implemented different recursive algorithms with **stacks, queues, linked lists, trees**, and **heaps** in Python.
- **Qualitative analysis** of an automobile dataset on Kaggle, using **R** language.
- Implementation of the **SEIRS** model to study the spread of infectious diseases.
- Investigation of different probability and statistics concepts including **Monte Carlo methods** with Python.

Control Engineering:

- State-space realization and simulation of a non-linear **hydraulic system** in MATLAB and Simulink.
- Car suspension system modeling and oscillation analysis using Simulink.
- Implemented different sensors like Ultrasonic-distance, pressure, LSTM, and temperature sensors.
- House Temperature Control by designing a sensor and activator in Simulink.
- Implemented different components like ADC, counter, timer, LCD display, external interrupt, PWM, digital pins on STM32CubeIDE micro-controller.

TEACHING ASSISTANT EXPERIENCES

- **Signals & Systems** (Spring 2022 & Fall 2022)
- **Electrical Circuits** (Fall 2021)
- **Linear Control Systems** (Fall 2022)
- **Machine Learning** (Fall 2022)
- **Engineering Probability & Statistics** (Spring 2021 & Spring 2022)
- **Electrical Machinery** (Fall 2021 & Spring 2022)
- **Engineering Mathematics** (Spring 2021 & Fall 2021)
- **Instrumentations** (Spring 2023)

EXTRACURRICULAR

- **Vice Chair** of IEEE student branch at University of Tehran.
- Member of **Iran's national team** at IYPT (International Young Physicists' Tournaments) 2017 competitions held in NUS, Singapore.

LANGUAGES

- **English:** Advanced Proficiency
  TOEFL iBT (Oct. 22, 2022) - 112/120 (R: 29, L: 28, S: 28, W: 27)
  GRE General (Oct. 11, 2022) - V: 144, Q: 163, AW: 4.0
- **French:** Elementary Proficiency
- **Persian:** Native