Fatemeh Taghvaei

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Summary

Seeking Roles: Data Science, Machine Learning Engineer, Computer Vision Engineer, NLP Engineer

- Data scientist with expertise in **computer vision** and **natural language processing**. A skilled problem solver with a talent for applying advanced techniques to solve complex industry challenges.
- Known for **leadership** and **management** skills, combined with a **collaborative** and **positive** approach. Dedicated to fostering a **supportive** and **productive** work environment.
- Passionate about **teaching** and **mentoring** children, eager to inspire and guide the next generation of engineers.

Skills

Languages: Python, Java, Matlab, HTML, CSS, VHDL, LaTeX
Machine Learning Frameworks: Scikit-learn, Keras, TensorFlow, PyTorch
Data Analysis & Visualization: Pandas, NumPy, SciPy, Beautiful Soup, Matplotlib, Seaborn
Computer Vision & NLP: Scikit-image, OpenCV, Pillow, NLTK, Hugging Face, LangChain
Development & Deployment: Kubernetes, Docker, MySQL, VMware, WordPress, Linux, Arduino, Raspberry Pi
Software & Simulation: Altium Designer, Proteus, STM32CubeMX, Factory IO

Work Experience

National Louis University, Chicago, IL   Sep 2024 - Present
Adjunct Faculty

- Teaching **Information Systems** course. Introducing students to fundamental concepts, including:
- **Networking devices** such as Hubs, Repeaters, Switches, Routers, and Gateways, with real-world examples of their functions.
- Various information systems like **Transaction Processing Systems (TPS)**, **Management Information Systems (MIS)**, and **Decision Support Systems (DSS)**, demonstrating their role in operational efficiency.
- **Database Management Systems (DBMS)**, along with hands-on experience using **Microsoft Access**.
- **E-commerce** fundamentals, covering **B2C**, **B2B**, and **C2C** models, and instructing on **HTML** and **CSS** for basic web structures and designs.

Northwestern University, Center for Talent Development, Evanston, IL   June 2024 - Aug 2024
Teaching Assistant

- Collaborated with instructors to deliver challenging instruction in **Machine Learning**, **Python**, and **Java** to middle and high school students.
- Led **virtual study sessions** for students, focusing on reviewing course material and assisting with assignments.
- **Supervised** students before class and throughout the academic day, ensuring engagement and support.
- Regularly **communicated** with instructors to review course goals, teaching strategies, and daily objectives.
- Assisted with instruction-related tasks, including tracking student progress and **leading** small group discussions.
- **Keywords:** Python, Java, Linear Regression, Logistice Regression, K-Nearest Neighbors, Support Vector Machines, Naive Bayes, K-means Clustering, Convolutional Neural Networks, Transfer Learning

Education

University of Illinois Chicago   Aug 2022 - Aug 2024
MS in Electrical and Computer Engineering   *GPA: 4.0*
Thesis: Computer Vision-Based Wildfire Detection in Video: Deep Learning Using Motion Estimation
Relevant Coursework: Computer Vision, Digital Image Processing, Pattern Recognition, Neural Networks

University of Isfahan   Sep 2017 - Sep 2021
BSc in Computer Engineering   *GPA: 16.18/20*
Thesis: Persian Car Plate Number Recognition using Raspberry Pi
Relevant Coursework: Object Oriented Programming, Discrete Structures, Data Structures and Algorithms, Operating Systems, Computer Networks. Signal & Systems, Artificial Intelligence

Publications

Combining Financial data and News Articles for Single Stock Market Prediction by prompting LLMs
The IEEE International Workshop on Large Language Models for Finance | Under review, 2024

- Ali Elahi, Fatemeh Taghvaei

Project Work

Image Denoising Techniques: Exploring Wiener Filter and Autoencoder

ECE 516 - Adaptive Digital Filtering

- Conducted a comprehensive literature review on image denoising techniques, covering classical methods such as **Gaussian smoothing**, **median filtering**, and **wavelet denoising**, as well as deep learning approaches including **CNN-based** and **GAN-based** methods.
- Implemented a classical **Wiener filter** and an **autoencoder** for denoising the corrupted MNIST dataset based on insights gained from the review.
- Performed comparative analysis of the efficacy of both techniques using MSE, SNR and SSIM metrics for evaluation.

Generating LaTex Code for Handwritten Mathematical Equations based on CNN

ECE 515 - Computer Vision and Image Analysis II

- Reviewed a wide range of CNN architectures, including **ResNet**, **EfficientNet**, **VGG**, **Inception**, **DenseNet**, **MobileNet**, and **AlexNet**, to identify the most suitable model for recognizing handwritten digits and mathematical symbols.
- Developed a system to recognize handwritten mathematical equations and generate the corresponding LaTeX code. The project was divided into two main parts: character recognition (including digits and mathematical symbols) and LaTeX code generation.
- Successfully implemented and tested the system, ensuring accurate conversion of handwritten equations into LaTeX code.

Semantic Segmentation on Covid-19 CT Scans using SegNet Architecture

ECE 434 - Multimedia Systems

- Reviewed various semantic segmentation techniques, including **U-Net** to identify the most suitable method for segmenting COVID-19 CT scan images.
- Developed a lung infection detection system using the **SegNet** architecture for pixel-wise **segmentation** of COVID-19 CT scan images.
- Achieved efficient training and high accuracy by leveraging SegNet's lower parameter count.