Majid Memari

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8+ Years of Experience in Data Science

Education

Ph.D. in Computer Science 2018—2023
Southern Illinois University Carbondale, IL

- **Comparative Analysis of VAE and GAN for Image Generation to Improve OCR System:**
- *Comparative analysis of two popular deep learning frameworks, Conditional **Variational Autoencoders (VAE)** and Conditional **Generative Adversarial Networks (GAN),** for generating synthetic images to enhance Optical **Character Recognition (OCR**) systems. The goal is to investigate the performance of these models and determine their effectiveness in improving OCR accuracy.*

M.S. in Computer Science 2015—2017
Southern Illinois University Carbondale, IL

- **Predicting the Stock Market Using News Sentiment Analysis:**
- *The main objective of this research is to investigate the accuracy of **predicting** the price movements of the Dow Jones, one of the famous indices of NYSE by market capitalization, using the News **Sentiments** derived from the GDELT database **(Big Data)**.*

Experience

Postdoctoral Researcher 08/2023 – Present
Utah Valley University

- I specialized in machine learning and computer vision, focusing on real-time drone and aerial imaging for wind turbine maintenance.
- My responsibilities ranged from locating turbines and calibrating drones for accurate 3D image generation to utilizing both RGB and thermal imaging to detect blade anomalies.
- I collaborated on integrating these findings into a state-of-the-art application, working alongside path-planning teams to ensure safe and efficient drone navigation.
- My role also involved overseeing experiments, reporting, and participating in interdisciplinary meetings while contributing to industry-relevant publications.

Data Scientist 05/ 2023 - Present
Potentia Analytics

- Designed and developed machine learning models to predict patient flow patterns in healthcare settings.
- Collaborated with other professionals to integrate these models into the software platform and analyzed large healthcare datasets to identify patterns and trends.

Research Assistant 01/2023 – 05/2023
University of Pennsylvania, PA

- Applied multimodal machine learning techniques, including text and audio-visual feature extraction, to analyze psychological data for interdisciplinary projects in human well-being.
- Improved feature extractor models and utilized machine learning to predict and explain these impressions based on labeled recordings of people talking.

Research Assistant 08/2015 – 08/2022
Southern Illinois University Carbondale, IL
Research Projects:

- Grocery Product Detection: Developed **object detection** algorithms (**RCNN, YOLO**) for improved retail inventory management and customer experience.
- **COVID Chest X-Ray** Image **Generation**: Utilized generative models (**GANs, VAEs**) to synthesize images for enhanced COVID detection and medical diagnosis.
- **Big Data Analysis**: Implemented **Motif Search** algorithms and leveraged the power of **Hadoop** and **Spark** frameworks to analyze **large-scale** datasets. These projects involved identifying and extracting patterns of interest, known as **motifs**, from the data.
- Twitter **Sentiment Analysis** for Stock Market Prediction: Performed **NLP** techniques to predict stock market trends and identify investment opportunities.
- News **Sentiment** Analysis for Stock Market Prediction: Analyzed news articles with **NLP** techniques to inform investment strategies based on market sentiment.
- **Statistical Analysis** for Big Data Insights: Analyzed and interpreted various types of datasets, including **structured**, **unstructured**, and **semi-structured** data. This encompassed working with numerical data, text data**, time series** data, and more. Each type of data presented unique challenges and required tailored statistical approaches to uncover valuable information.
- **Synthetic** Fingerprint **Generation** for **Detection**
- Improvement: Developed generative models (**GANs, VAEs)** for enhanced biometric security systems.
- Argane Tree **Genome Assembly**: Assembled a reference genome to aid in conservation, cultivar breeding, and understanding metabolic pathways for cosmetic and pharmacological applications.
- Assisted other research teams by providing guidance and expertise in **high-performance computing (HPC)**, optimizing their computational workflows, and facilitating efficient use of HPC resources.
- Provided computational support to research projects focused on investigating the effects of nicotine and marijuana on various aspects of cognitive functioning and **brain activity**. These projects utilized two essential methods: **Electroencephalography (EEG)** and **Functional Magnetic Resonance Imaging (fMRI)**.
- Supported research on **fMRI Image Registration** using **Deep Learning.** Separated 4D fMRI into volumes for registration with anatomical images. Explored

unsupervised learning and synthetic data generation.
Implemented a 3D-CNN model using Keras.

Licenses & Certifications

- **TensorFlow** Advanced Techniques Specialization
- **PyTorch** Advanced Techniques Specialization
- **AWS** Data Science Specialization
- Digital **Image Processing**

Skills and Tools

- *TensorFlow, PyTorch, Caffe, MXNet, CNTK, CUDA*
- *Oracle Database, Microsoft SQL Server, MongoDB*
- *Amazon Web Services, Microsoft Azure, Google Cloud*
- Programming Languages: *Python, R, Java, C#*