



Vedant Bhasin

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Carnegie Mellon University

Master of Science in Electrical & Computer Engineering

AI/ML Systems Concentration [CGPA: 3.92/4.00]

Coursework: LLM Systems, Distributed Systems, Multimodal Machine Learning, Advanced Natural Language Processing

May 2024

Pittsburgh, PA

Carnegie Mellon University

Bachelor of Science in Electrical & Computer Engineering

Software Systems Concentration [CGPA: 3.39/4.00]

Dean's List Fall '19, Fall '22

Coursework: Deep Reinforcement Learning & Control, Introduction to Deep Learning, Introduction to Machine Learning

May 2023

Pittsburgh, PA

EXPERIENCE

Carnegie Mellon University, Language Technologies Institute

January 2023 - May 2023

Teaching Assistant - Deep Learning

Pittsburgh, PA

- Teaching Assistant for Carnegie Mellon University's flagship deep learning course with Professor Bhiksha Raj.
- Lead TA for two of the four major projects in the course; responsible for preparing data sets, developing starter notebooks, and conducting experiments to discover high-performing architectures and optimization specifications.
- Leading recitations and lectures on Vision Transformers, Deep Reinforcement Learning, and project workflow fundamentals.

Axaitech

July 2022 - August 2022

AI & Data Science Intern

Cape Town, South Africa

- Developed a random forest classifier to distinguish between 11 different cancer types using gene expression data.
- Utilized feature selection techniques such as Mean Absolute Deviation, Recursive Feature Elimination, and Random Forest Feature Importance to reduce the number of features from 58,440 to 20 while maintaining a classification accuracy above 95%.
- Prototyped, evaluated, and optimized different models using Scikit-Learn and PyTorch; fine tuned hyper-parameters through random grid search. Attained a classification accuracy of 95.20%.

LEADERSHIP

Sigma Chi Fraternity, Lambda Pi Chapter

May 2022 - May 2023

Vice President

Pittsburgh, PA

- Managed the executive committee and spearheaded the planning, organization, and execution of social and philanthropic events.
- Raised \$18,950 in funds for the Huntsman Cancer Foundation by coordinating and hosting *Derby Days*.

PROJECTS

Fine Grained Image Grounding for Visual Abductive Reasoning

December 2023

- Collaborated with a team of two other researchers to address the task of Visual Abductive Reasoning (VAR) in vision-language models. VAR refers to the task of making the most plausible inference about an image region with incomplete information.
- Pioneered a method that incorporates scene graph information of the image with no modification to the model architecture.
- Led the development of a fine-tuning pipeline using PyTorch, enabling the enhancement of BLIP2 models with an InfoNCE contrastive loss for improved performance, Improving P@1 scores by 15.6% and 3.9% over scene graph and image-only models.

Symphony AI

May 2023

- Designed and built a full-stack generative music web application enabling users to record/upload guitar music and generate piano accompaniments using a pre-trained REMI transformer model. Collaboratively conceptualized, designed, and implemented the application with a two-member team across three sprints, adhering to agile software development methodologies.
- Conducted comprehensive research on various generative systems to select an optimal model that effectively balances music quality, model latency, and system compatibility according to user and system requirements.
- Spearheaded the development of the web application, integrating various subsystems into a Django backend.

Face Classification and Verification with CNNs

Dec 2022

- Performed ablation studies with MobileNetV2, ResNet-50, and ConvNeXt from scratch for face classification and verification on the VGG Face 2 dataset.
- Experimented with different deep metric learning approaches such as ArcFace loss, triplet margin loss, and circle loss to maximize verification accuracy. Independently implemented ArcFace loss using the research paper as a reference.
- Implemented data augmentation techniques, including Random Augment, Random Perspective, and Random Erasing to mitigate overfitting. Applied regularization methods, including label smoothing, stochastic depth, and weight decay.
- The model correctly classified a satisfactory 92.83% of faces during testing.

SKILLS

Programming Languages: Python, C, JavaScript, HTML/CSS, SQL

Libraries and Frameworks: PyTorch, Scikit-Learn, Pandas, NumPy, Seaborn, Django, AWS, Google Cloud Platform, Git

Application Software: MATLAB, Visual Studio Code, Jupyter Notebooks, Google Colab