Jianglong Yu

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EDUCATION

Texas A&M University (GPA: 4.0/4.0) **Aug 2023 - Dec 2024**
Master of Science in Computer Science College Station, TX

Oregon State University (GPA: 3.7/4.0) **Sep 2019 - Jun 2023**
Bachelor of Science in Computer Science Corvallis, OR

PROJECTS

Optimization of Decision Transformer for Atari Games **Spring 2024**
Overview: Replicated and enhanced a **Decision Transformer**, an AI model that uses **reinforcement learning** to optimize decision-making from gameplay data. Applied and fine-tuned this model to improve performance across various Atari video games.
Data Processing: Downloaded game data from the **Batch RL** public database and employed a database storage method to effectively manage memory usage; Enhanced model understanding and representation of game states by segmenting data into chunks and implementing frame stacking.
Model Optimization: Upgraded from a lightweight to a more comprehensive **multi-head attention** mechanism, improving precision and performance; Conducted extensive parameter tuning, comparing learning rate strategies, and established **AdamW** as superior to **Cosine Annealing**, resulting in an approximate 8% performance increase with the same amount of data.
Memory Management: Implemented timely data cleanup strategies to maintain consistent memory usage, optimizing model operational efficiency and stability.

Image Compression Using Conditional Diffusion Models **Spring 2024**
Overview: Developed an image compression system by integrating a **VAE** with **diffusion** models. This model aims to efficiently compress and subsequently enhance image quality through advanced machine learning techniques.
Compression:Utilized a VAE to encode images into a compact latent space, reducing data dimensionality. Integrated quantization and entropy encoding strategies to optimize storage efficiency.
Diffusion Model for Reconstruction: Incorporated a diffusion model to refine and enhance the images reconstructed from the compressed data. This step focused on restoring lost details and improving visual fidelity.
Results: The model was trained and validated on the Vimeo-90k dataset, achieving significant improvements in image quality as evidenced by **PSNR** and **bpp** metrics.

Multimodal Image and Audio Recognition Model **Spring 2024**
Overview: Developed an advanced multimodal model for accurate recognition and analysis of MNIST images and Audio MNIST data
Image Processing: Implemented deep feature extraction for MNIST images using **CNN ResNet-50**.
Audio Processing: Applied **spectral subtraction** for noise reduction in audio data; Trained processed audio data with **minGPT** to enhance recognition accuracy; Utilized **t-SNE** to analyze and improve the performance of the initial audio model by identifying weak areas and optimizing through data preprocessing.
Model Fusion: Employed **multi-head attention** mechanism to effectively combine features from both modalities.
Achievements: Achieved a 99.5% accuracy rate on the standard test set, demonstrating the model's effectiveness and applicability.

WORK EXPERIENCES

Teaching Assistant, Oregon State University **Jun 2022-Mar 2023**
Web Development Course Corvallis, OR
Responsibilities: Responsible for grading, reviewing assignments. Design and implement strategies to enhance student engagement. Focus on teaching interaction and communication to achieve significant results, and have improved my personal communication abilities and teaching skills.

Research Assistant, Development of a Supply Chain Model **Oct 2022-Jun 2023**
Mentor: Professor. Karthika Mohan Corvallis, OR
Content: Developed a supply chain forecasting model for the automotive industry, utilizing probabilistic programming, supply chain forecasting, and data analysis techniques to optimize manufacturing processes and reduce inventory backlogs. This experience enhanced my theoretical knowledge and practical problem-solving abilities.

PROFESSIONAL SKILLS

Languages: Python, C/C++
Technologies: Git, PyTorch, Gym, OpenCV, Docker, Deep Learning, Flask, Agile Development, Problem Solving.