Jasper Tan

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EDUCATION

The University of Texas at Austin Austin, TX
B.S. Electrical and Computer Engineering; Minor in Business Administration May 2025
Cumulative GPA: 3.84/4.0
Relevant Coursework: Computer Vision, Reinforcement Learning, Algorithms, OS, Data Science Lab, SWE Lab, Linear Alg., Prob.

TECHNICAL EXPERIENCE

Cvent - Incoming *Software Engineering Intern*; Tysons Corner, VA Jun 2024 - Aug 2024

University of Texas at Austin - *Machine Learning Researcher*; Austin, TX Aug 2023 - Present
- Advancing a novel detection model incorporating feature fusion for acoustic and inertial classification of human activity
- Conducting transfer learning on a MobileNet V2 architecture for feature extraction and fine-tuning based on IMU data
- Exploring model architectures (YAMNet, ResNet, VGG-16) trained on Google AudioSet to classify sound and image data

FirstParty - *Data Engineering Intern*; New York, NY Jun 2023 – Present
- Developing Python scripts in AWS SageMaker leveraging GPT Text Embedding models to compute string similarities
- Leveraging cosine similarities and Levenshtein distance algorithms to generate confidence scores for data stored in S3
- Spearheading data classification utilizing natural language processing methods to enrich the internal database
- Employing advanced unit testing methodologies and object-oriented programming to design automated data ingestion applications and queries integrated with AWS RDS and PostgreSQL to manage Web Scraped Data in Pandas DataFrames

Texas Spacecraft Laboratory - *Command and Data Handling Researcher*; Austin, TX Aug 2022 – Jun 2023
- Formalized 5+ satellite configurations to optimize position and image processing using a fully connected neural network
- Implemented a GPS and EPS interface in C/C++ on an I2C bus to assess the relative pose estimate of a target in space
- Conducted system testing in a virtual machine for 2+ satellite designs to compete in a NASA spacecraft competition

Rutgers University - *Image Processing Intern*; New Brunswick, NJ Jun 2019 – Aug 2019
- Applied MATLAB scripts in a laboratory environment to conduct a comprehensive analysis of specific adhesion points
- Employed advanced processing techniques on images of fluorescent neurons generating precise FRET-corrected images
- Evaluated the use of Vinculin Tension Sensor for mechanotransduction in cultured cortical neurons from FRET images

PROJECTS

Chatbot-Enhance Recommender System May 2024
- Designed a novel training architecture with LLMs to generate recommendations based on conversations and user history
- Fine-tuning various LLMs (Gemma, Llama 2, Mistral) with LoRA to synthesize user data into recommendation requests
- Developing a pipeline with a BERT model encoder to feed embeddings to a fine-tuned DeepFM recommendation model

Fashion-Atlas May 2024
- Devised a garment re-identification application aimed at localizing clothes from images to give tailored recommendations
- Leveraged YOLOv8 to train a real-time object segmentation and classification neural network to crop and identify images
- Trained a CNN on a ResNet 50 architecture with a triplet loss function and Euclidean Dist. to generate feature embeddings

RL-Finetune-Diffusion Apr 2024
- Fine-tuned a text-to-image diffusion model (Stable Diffusion) using Reinforcement Learning to generate prompted images
- Built a distributed pipeline using Transformer Reinforcement Learning and image reward model libraries to adjust weights
- Employed policy gradient methods (DDPO, DPOK, DDPG, HER) and LoRA finetuning to improve iterative denoising steps

RationaLLM Apr 2024
- Fine-tuned an instruction-tuned Llama 2 utilizing QLoRA to solve complex rational NLI tasks from the LogicQA dataset
- Employed 4-bit quantization with Bits and Bytes to the LLM, and tokenization of text inputs to minimize compute resources

APL Catalog Management System Apr 2023
- Implemented a backend database and management system with Java and an intuitive front-end GUI with FXML and CSS
- Employed socket programming, observers, and multi-threading techniques to facilitate client-server communication
- Innovated custom encryption using salting and MD5 hashing for the security of accounts, enabling multi-device login

SKILLS & INTERESTS

Technical Skills: Python, C/C++, Java, JavaScript, Linux, Git, JSX, React.js, PyTorch, Tensorflow, Flask, AWS, HTML/CSS, SQL
Awards: Haliburton Stem Scholarship, IEEE UT Austin Branch Membership Scholarship, AP Scholar with Distinction, NHS
Interests: Ultimate frisbee, Spike ball, Photography, Climbing, Biking, Cooking, Human Signals and ML Research