

# Jasper Tan

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## EDUCATION

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### The University of Texas at Austin

Master of Science in Electrical and Computer Engineering

May 2026

GPA: 4.0/4.0

### The University of Texas at Austin

Bachelor of Science in Electrical and Computer Engineering; Minor in Business Administration

May 2025

GPA: 3.84/4.0

Coursework: Reinforcement Learning, Machine Learning on Real-World Networks, Computer Vision, Operating Systems, Computer Architecture, Probability, Algorithms, Data Science Lab, Software Engineering Lab, Matrices

## SKILLS

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**Programming Languages:** Python, C/C++, Java, MySQL, HTML/CSS, JavaScript, TypeScript, GDScript, Verilog

**Frameworks & Tools:** PyTorch, TensorFlow, Numpy, Pandas, SciKit-Learn, Git, Linux, Flask, GraphQL, React.js, Node.js

**Technologies:** AWS, Unreal Engine, Cypress, Docker, Rancher Desktop, Datadog, CircleCI, LaunchDarkly, MongoDB

## TECHNICAL EXPERIENCE

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**Cvent** - *Software Engineer Intern*; Tysons Corner, VA

Jun 2024 – Aug 2024

- Designed date-time modals in JavaScript with optimized state management using Redux, React hooks, and mutations
- Implemented real-time data visualization and logging with Datadog to monitor GraphQL queries to a PostgreSQL database
- Created 3D models and animations in Unreal Engine 5 using C++ for simulating custom event spaces with spatial computing
- Leveraged npm for faster dependency management and build process, integrating Jest unit and Cypress smoke tests

**The 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
- Deploying a lightweight computer vision model for object localization on an edge device, using LiteRT for inference speed

**FirstParty** - *Data Engineer Intern*; New York, NY

Jun 2023 – Jun 2024

- Developed Python scripts in AWS SageMaker leveraging GPT Text Embedding models to compute string similarities
- Leveraged cosine similarities and Levenshtein distance algorithms to generate confidence scores for data stored in S3
- Spearheaded data classification utilizing natural language processing methods to enrich the internal database
- Employed object-oriented programming to design automated data ingestion applications to manage web-scraped data

**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 estimate the relative pose of a target in space

## PROJECTS

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### Chatbot-Enhance Recommender System

Aug 2024

- Designing a novel training paradigm 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
- Training a BERT text encoder and DeepFM recommendation model using triplet loss to enhance movie recommendations.

### Graph Reinforcement Learning for Semantic Segmentation

Aug 2024

- Implemented graph-based reinforcement learning to improve semantic segmentation of 2D images and 3D point clouds
- Developed graph convolutional networks with dueling Deep Q-learning, optimizing node classification and navigation
- Designed large-scalable graph environments handling 30,000+ nodes using k-nearest neighbor for 2D and 3D data

### 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 detection and classification neural network to crop and identify images
- Trained a CNN on a ResNet 50 architecture with a triplet loss function and cosine similarity to generate feature embeddings

### Hindsight Experience Replay for Diffusion Models (HERD)

Apr 2024

- Fine-tuned a text-to-image diffusion model (Stable Diffusion) using Reinforcement Learning to generate prompted images
- Built a distributed training pipeline using Transformer RL, image reward, and policy gradient methods (DDPO, DPOK, DDPG)

### RationalLlama

Apr 2024

- Fine-tuned an instruction-tuned Llama 2 using QLoRA to solve complex rational NLI tasks from the LogicQA dataset
- Employed 4-bit quantization with Bits and Bytes to minimize compute resources, and achieved an 8% increase in accuracy