Justin Jasper

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EDUCATION

Stanford University Stanford, CA
Master of Science in Computer Science (Concentration: Artificial Intelligence) *June 2026*

Stanford University Stanford, CA
Bachelor of Science in Bioengineering *June 2025*

COMPUTATIONAL EXPERIENCE

MITRE Corporation Mclean, VA
Computational Biology Intern *June 2024 - Present*

- Designed automation software to optimize high-throughput training and fine-tuning processes for open-source large language models (LLMs).
- Developed an LLM-driven retrieval augmented generation system to extract and summarize key insights from complex scientific literature, streamlining knowledge access for synthetic biology workflows (Used scientific python, LangChain, LlamaIndex, Kubernetes).
- Constructed the BioNet Domain-Specific Language, an open-source programming language designed to enable extensive scaling of synthetic biology experiments and industrial workflows.

Omniwear AI Palo Alto, CA
CoFounder, CEO *December 2022 - December 2023*

- Led the development of a cutting-edge B2B virtual try-on platform for e-commerce powered by computer vision and generative AI, catering specifically to the D2C retail clothing sector.
- Spearheaded the B2B growth strategy, successfully acquiring early customer brands. Notably, secured partnerships with a retail giant valued at over $1 billion and a retailer valued at around $250 million.
- Established and maintained direct communication channels with corporate executives, ensuring seamless collaboration and addressing clients' unique needs and concerns.
- Participated in Launchpad (Stanford's premier graduate accelerator) Spring '23 and Entrepreneur First's NYC unicorn training program.
- https://www.tryomniwear.com/demo

PROJECTS

CV Image Processing for CT and Ultrasound-based Tumor Detection

- Developed a computer-vision (CV)-based image processing pipeline for lung CT scans using Python and OpenCV to segment and reconstruct 3D lung images for clinical diagnosis of suspected cancer.
- Explored deep learning for tumor segmentation using an Attention U-Net model with TensorFlow, achieving high accuracy in classifying malignant and benign lesions.
- Implemented K-means clustering to classify lung tissue and air regions, achieving accurate segmentation of lung abnormalities.

Computer Vision for Meal Nutritional Analysis

- Developed a computer vision (CV)-based web application that detects and classifies food items from user-uploaded images.
- Trained a ResNet18 convolutional neural network model on a Food image dataset from Kaggle (using Tensorflow)
- Implemented an object detection pipeline to localize and identify food items before classification.
- Built a full-stack web interface using HTML (frontend) and a Python Flask backend to allow users to upload images for real-time food classification.
- https://github.com/justinjasper/cv-nutritional-analysis

Synthetic Biosensor Development for Pathogen Detection

- Developed a novel biosensor to detect waterborne Salmonella enterica using a SynNotch receptor system with an anti-Salmonella single-chain variable fragment (scFv) transfected into human embryonic kidney cells (HEK293)
- Designed and transfected mammalian cell cultures (HEK293) with receptor plasmids, optimizing expression through flow cytometry and Western cell blotting analysis.
- Leveraged common wet lab techniques including polymerase chain reaction (PCR), gel electrophoresis, mammalian cell cultures, and bacterial cultures

Computational Analysis of NMDA Receptor Antagonist Binding for Chronic Pain Therapeutics

- Investigated the molecular interactions between NMDA receptor antagonists and their binding sites using molecular docking simulations with SwissDock and AutoDock Vina.
- Designed and optimized docking workflows, refining model parameters to maximize accuracy in predicting ligand-receptor interactions.
- Quantified binding affinities to assess antagonist efficacy, providing computational insights for drug repurposing in chronic pain management.

SKILLS

- Proficient in Python (NumPy, Pandas, SciKit-learn, TensorFlow), C++, C, MATLAB, git, UNIX, LLM training & deployment (LangChain, LlamaIndex, Kubernetes), retrieval augmented generation (RAG), neural networks
- Proficient in Spanish, with strong cross-cultural communication skills.