Samuel Vance

+1 (208) 881-1245 | samvance243@gmail.com | www.linkedin.com/in/samuel-vance

EDUCATION

Brigham Young University Apr 2025
Bachelor of Science – Machine Learning *Provo, UT*
GPA: 4.0 / 4.0 ACT: 33 (99th Percentile)

- Scholarships: University Academic Full Tuition, Department of Electrical & Computer Engineering

EXPERIENCE

Artificial Intelligence Intern May 2024 – Aug 2024
Nvidia

- Developed 3 multi-agent LLM workflows that boosted engineer productivity by 50% on unique complex tasks
- Evaluated several base models, multi-agent architectures, tools, and system prompts for optimized performance
- Designed and built a web UI with conversational memory for intuitive user interaction with the various agents
- Implemented multiple configurable CI/CD pipelines for simple containerization and auto-deployment of agents
- Built an internal documentation website for others to easily find, deploy, and use my work for novel use cases

Robotic Legs March 2024 – *Present*
Smart Prosthetics

- Designed 3 different leg prototypes from scratch using Fusion 360, and 3D printed all for experimentation
- Created a PCB integrating over 25 individual components including 2 microcontrollers, 6 motors, and 6 gyros
- Completed by hand the inverse kinematics required to move the foot to a desired position given Cartesian coords
- Calculated the Cartesian coordinates of the leg's center of mass at any given time to aid in planning and controls
- Wrote 700+ lines of C++ code to accurately calculate inverse kinematics, gather telemetry, and control the legs
- Created URDF representation of the legs for simulation in ROS2 environments such as RViz2 and Gazebo

Research Assistant May 2023 – Feb 2024
Perception Control & Cognition Lab - BYU

- Coordinated distributed training runs across 8 nodes and 80 A100 GPUs on the university supercomputing cluster
- Designed and ran over 10 large scale experiments testing the capabilities of 11 LLMs including the Meta LLaMA family, T5, OPT, and the OpenAI GPT family
- Awarded session winner at BYU's Student Research Conference for my research presentation on Mimicking Human Persuasive Dynamics With Large Language Models (LLMs).
- Utilized DeepSpeed ZeRO Stage 3 with CPU offload to fine-tune 32B parameter LLMs on just 8 A100 GPUs

Self-Playing Flute Oct 2022 – Jan 2023
Assisted Instrument

- Wrote 400+ lines of C++ code to match musical notes with servo positions, enabling control of 6 servo motors
- Designed a custom PCB and performed precise component soldering to optimize the flute's performance
- Designed and fabricated customized mounts using 3D printing technology to seamlessly integrate servo motors and an Arduino Uno with the flute
- Developed a song selection UI with an LCD display and a dial for simple intuitive user interaction

AI Light Painting May – Jul 2023
Electronic Photography

- Wrote a finger-painting program using the MediaPipe hands model to detect hand motions from a laptop webcam
- Created an art program in Python to use a mouse to increase light painting detail compared to finger-paintings
- Designed, built, and programmed a custom machine to paint the artwork in the air using stepper motors and LEDs

Autonomous Drone May – Sept 2020
Obstacle Detection

- Created a custom drone using Fusion 360 and designed a PCB for secure integration of electronic components
- Wrote a custom obstacle detection program in C++ which used ultrasonic sensors to scan the area for hazards

SKILLS

- Proficient in C++, Python, Java, PyTorch, Docker, Huggingface Transformers, Charliecloud, and Mamba
- Skilled at building multi-agent and Retrieval Augmented Generation (RAG) LLM applications
- Experienced running distributed training using a variety of deep learning libraries like PyTorch-Lightning
- Fluent in Spanish (written and verbal)