

Chace Caven

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Experience

Undergraduate Researcher

Atlanta, GA

STRUCTURED INFORMATION FOR PRECISION NEUROENGINEERING LAB

Aug 2024 → Present

- Performed a comprehensive literature review of machine learning methods for analyzing neural population dynamics
- Designed a genetic algorithm to discover sparse liquid neural network graphs from electroencephalogram (EEG) signals
- Invented a method for probabilistic model predictive control for a PhD student studying closed-loop optogenetic control

Campus Intern

Atlanta, GA

CDW·G

Aug 2024 → Present

- Independently formed relationships with over 50 Georgia Tech faculty and staff to reinforce CDW·G ↔ Georgia Tech relationship
- Synthesized Georgia Tech research projects and grants in the context of institutional priorities and global initiatives
- Crafted and executed action plans with CDW·G account representatives to introduce new opportunities for IT solutions

Machine Learning Intern

Jacksonville, FL

VoxEQ, Inc.

April 2024 → Aug 2024

- Independently developed self-supervised pipelines for audio and speech data inspired by state of the art techniques
- Benchmarking custom PyTorch models on Speech processing Universal PERFORMANCE Benchmark (SUPERB)
- Built multi-terabyte dataset creation tool in Rust to shift the training distribution to match the target distribution
- Pipeline: Custom dataset builder → masked image modeling → fine-tune with speaker ID labels → benchmark on test set

Computer Vision Intern

Jacksonville, FL

WORKING DRONES, INC.

Jan 2023 → April 2024

- Independently developed a novel computer vision technique in PyTorch for Simultaneous Localization and Mapping
- Built a virtual environment with OpenGL to generate synthetic datasets with camera localization ground truth information
- Pipeline: Sim → VQ-VAE → Localization tokenizer → Autoregressive transformer → Novel view synthesis and visual odometry

Robotics Engineer Intern

Jacksonville, FL

WORKING DRONES, INC.

Aug 2023 → Jan 2024

- Physically assembled 20+ proprietary Power Wash drones by operating chop saws, threading machines, riveters and drills
- Worked with carbon fiber tubes, custom 3D prints, epoxy, waterproof tube sealant, water manifolds, and printed circuit boards
- Constructed and programmed a Raspberry Pi Pico based microcontroller to collect and broadcast FAA Remote ID information
- Designed and developed a classical computer vision algorithm to segment the drone tether from a downward-facing camera
- Created a prototype of ORB-SLAM 2 using color and depth from Oak-D Lite camera with real-time map visualization
- Tech stack: C++, ROS 2, OpenCV, Rust, DepthAI, Mavlink, PiGPIO C library, ORB-SLAM 2, Pangolin

Projects

Hackathon Winner

🌐 shayaf84/clarity

COFOUNDER/DEVELOPER/PRESENTER

Oct 2024 → Oct 2024

- In 36 hours, designed and developed an early warning system for preventable medical errors by detecting doctor fatigue
- Fine-tuned a Vision Transformer model by hand-optimizing which layers to activate to maximize accuracy without overfitting
- Accelerated with a fast Haar Cascade face classifier to reduce the frequency of expensive Vision Transformer inference calls
- On two hours of sleep, successfully presented to hackathon judges, including the Dean of the College of Computing
- Tech stack: Python, Flask, PyTorch, JavaScript, HTML, CSS, WebRTC, CanvasRenderingContext2D

GPU-accelerated Simultaneous Localization and Mapping (SLAM)

🌐 ccaven/tinyslam

DESIGNER/DEVELOPER

Mar 2024 → May 2024

- Redesigned classical SLAM algorithms for massively parallel GPU processing to enable deployment on a Raspberry Pi 5
- Supported free and open-source high performance visual odometry for independent researchers and small companies
- Drop-in extension to existing visual SLAM libraries via ROS 2 as the foreign interface connector, i.e., Rust → C++
- Tech stack: Rust, WebGPU, Vulkan, ROS 2, Multi-consumer multi-producer channels (MPMC), Native window management

Education

Georgia Institute of Technology

Atlanta, GA

B.S. IN COMPUTER SCIENCE & B.S. IN MATHEMATICS

Expected Graduation May 2027