

Joshua Aney

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EDUCATION

Montana State University

Bachelor of Science, Computer Science, GPA: 3.96

Bozeman, MT

May 2026

RESEARCH EXPERIENCE

Research Technologist

CaMP Lab (Cybernetics and Motor Physiology), Mayo Clinic

June 2026 – Present

Rochester, MN

- Performed motor and language mapping on patients with epilepsy using computational techniques to identify anatomical locations with activity during tasks.
- Recorded data for experiments in the Epilepsy Monitoring Unit (EMU) from Stereoelectroencephalography (SEEG) leads and preprocessed the raw data from BCI2000 into a more friendly format for analysis.

Undergraduate Research Assistant

HACR Lab (Harnessing Automation in Cybersecurity Reasoning), Montana State University

January 2026 – June 2026

Bozeman, MT

- Built pipelines to produce control flow graphs from compiled binary packages for code embedding generation.
- Designed Graph Neural Network architectures using PyTorch.
- Ran machine learning workloads on Tempest, Montana State University's high performance computing system.

Summer Research Intern

CaMP Lab (Cybernetics and Motor Physiology), Mayo Clinic

Summers 2024, 2025

Rochester, MN

- Conducted algorithmic analysis on human sEEG data.
- Implemented signal processing pipelines including noise reduction, baseline correction, and artifact rejection.

PUBLICATIONS & PRESENTATIONS

Papers in Preparation

- Aney, J., et al. *Parameterization of intracranial auditory evoked responses reveals cortical novelty and attention effects*. Paper in preparation for submission.

Posters and Abstracts

- Aney, J., Jensen, M., Kerezoudis, P., Canales-Johnson, A., Hermes, D., Baker, M., Miller, K. *Parameterization of intracranial auditory evoked responses reveals cortical novelty and attention effects*. BRAIN Initiative Conference, 2026.
- Aney, J., Jensen, M., Kerezoudis, P., Canales-Johnson, A., Hermes, D., Baker, M., Miller, K. *Parameterization of intracranial auditory evoked responses reveals cortical novelty and attention effects*. GATTLE Neurosurgery Symposium, Mayo Clinic, 2026.

TEACHING & CURRICULUM DEVELOPMENT

Independent Study – CSCI 491-7 Hypermedia Systems

Montana State University

Fall 2025

Bozeman, MT

- Collaborated with a professor and a team of three students to design and develop a semester-long project template for an advanced web development course.
- Implemented core website functionality, including the MVC controller layer, authentication and authorization systems, and multi-step business workflows, for a veterinary clinic management system.
- Structured a progressive assignment sequence so students could implement new controllers by following established patterns in the codebase.

TA – CSCI 132 (Data Structures and Algorithms)

Montana State University

Sprint 2026

Bozeman, MT

- Assisted students in learning core data structures algorithms (trees, hashmaps, depth first search, etc.)
- Taught students how to debug in their IDE's.

TECHNICAL PROJECTS

Machine Learning and AI Models from Scratch	2024-2026
- Implemented the following machine learning algorithms from scratch without pre-built libraries: Naïve Bayes, K-Nearest Neighbors, K-Means, and DBSCAN, Multi-Layer-Perceptron, Q-Learning, SARSA, and Value Iteration - Implemented a First-Order-Logic engine to perform inference on knowledge bases using resolution. - Implemented the following optimization algorithms from scratch: Backpropagation, Genetic Algorithm, Differential Evolution, Particle Swarm Optimization, and Simulated Annealing	
Prize-Collecting TSP Solver	2026
- Formulated the Prize-Collecting Traveling Salesman Problem as a mixed-integer linear program and solved it exactly using IBM CPLEX. - Implemented a genetic algorithm as an alternative heuristic solver and compared solution quality and runtime against the exact CPLEX formulation.	
Bozeman Bike Trails Application	2024
Developed a web application to track user-ridden bike trail GPS data using .NET Razorpages	
Hand Tracking / ASL Alphabet Detection	2024
Created a pipeline to collect data, train a dense neural network, and provide real time predictions for video inputs using Pytorch and Mediapipe.	

HONORS & AWARDS

President's List: Spring 2022; Spring 2023, Fall 2023; Spring 2024; Spring 2025, Fall 2025; Spring 2026, Fall 2026
Dean's List: Fall 2022; Fall 2024

OTHER ACTIVITIES

President <i>Montana State University Tennis Club</i>	August 2023 – May 2026 <i>Bozeman, MT</i>
Section Leader <i>Montana State University Drumline</i>	April 2025 – January 2026 <i>Bozeman, MT</i>
Tennis Coach <i>Rochester Tennis Connection</i>	Summers 2023, 2025 <i>Rochester, MN</i>
Substitute Tennis Coach <i>Bobcat Anderson Tennis Center, Montana State University</i>	2022 – 2026 <i>Bozeman, MT</i>