

SAMUEL ISAAC BARANOFF BURNS

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EDUCATION

University of Southern California

August 2023–December 2026

Bachelor of Science

- GPA: 3.94 / 4.0; Viterbi Dean's List all semesters
- Dean's Research Award (DRA) 2024-2025

RELEVANT COURSEWORK

Fluid Dynamics, Differential Equations, Calculus I-III, Mathematical Methods, Physics Mechanics and Thermodynamics, Physics Electricity and Magnetism, Statics, Materials Science, Mechanics of Materials and Structures, Flight Mechanics, Data Structures

RELEVANT SKILLS

MATLAB, Python (NumPy, matplotlib), Arduino, Java, CAD (Siemens NX CAD, Onshape), Excel, Machine Learning (PyTorch, Gymnasium, Mujoco, PyBullet), LaTeX, FEA (ANSYS Structural), CFD (ANSYS FLUENT), XFOIL, Mathematics

ACADEMIC PROJECTS

Leader, Deep Q-Learning Aircraft Landing Control Project and Study, Mountain View, CA

December 2024–January 2025

- Designed a custom Gymnasium environment for aircraft descent and integrated physics-based reward shaping, simulating over 200,000 training episodes to capture realistic 2D flight dynamics
- Conducted comprehensive hyperparameter studies by varying batch sizes (32, 64), learning rates (1×10^{-4} to 1×10^{-3}), discount factors (0.95–0.999), and epsilon decay rates (0.995, 0.980) to analyze stability and performance
- Identified an optimal configuration boosting landing control performance by 51%, achieving a top score of 398 compared to an average of 264, demonstrating significant improvements in deep Q-learning efficiency

Group Leader, Principles of Statics: Bridge Construction & Analysis, Los Angeles, CA

November 2024–December 2024

- Built and modeled bridge in CAD to create a 1:1 3D model for structural analysis, construction, and demonstration
- Determined forces in each member of bridge under 40lbs of applied force using method of joints; verified using ANSYS FEA

Core Group Member, Glider Project: Construction and Analysis, Los Angeles, CA

September 2023–December 2023

- Constructed and optimized a glider around the 6412 NACA airfoil; analyzing flight characteristics using MATLAB and XFOIL
- Modeled basic flight performance up to 25 m/s and tested glider up to 12 m/s
- Created a report explaining over 300% divergence from theory; highlighted potential causes of deviation and likelihoods

WORK EXPERIENCE

Undergraduate Research Fellow, Thomas Lord Department of Computer Science

August 2024–Present

Sensing, Learning, and Understanding for Robotic Manipulation Lab at USC (SLURM), Los Angeles, CA

- Integrate a PyBullet or Mujoco-based MPC to leverage the Unitree Go2's balance to free one leg for deformable-object manipulation, and utilize PyTorch to train an imitation model to allow for multi-modal actions to complete tasks
- Facilitate weekly in-person lab meetings and manage Notion documents to share research findings and guide refinement

Member, Analysis

August 2024–Present

USC Rocket Propulsion Lab, Los Angeles, CA

- Leverage ANSYS Structural FEA to reduce weight while maintaining a robust safety margin and preserving overall strength
- Expand proficiency in CFD (ANSYS Fluent) for internal and external flow simulations, including a supersonic fin model

Sales Associate, Retail

May 2024–August 2024

Vuori, Inc, Palo Alto, CA

- Engaged with 100+ customers daily to deliver tailored solutions, earning positive feedback in online reviews
- Pursued revenue targets benchmarked against the same day's sales from prior years, with days exceeding \$40,000 in sales

Technology Intern, Product Management

May 2023–June 2023

Alayna - CUES Technology, Los Angeles, CA

- Pitched an AI tool to over 15 educators, gathered feedback, and relayed ideas to the team, driving targeted enhancements
- Reviewed the pre-release version, identifying bugs and proposing 10+ features with integrations to refine functionality