

Benjamin Hinchliff

Computer Scientist Specializing in Computer Vision, Simulation, and Space Robotics

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EDUCATION

California Polytechnic State University, San Luis Obispo	M.S. Computer Science	Dec 2025
Thesis: MarsAnywhere: Dataset and Cross-view Diffusion Model for Satellite-to-Ground View Synthesis with Mars Data		
California Polytechnic State University, San Luis Obispo	B.S. Computer Science	Jun 2024
GPA 3.88 / 4.00 – Summa Cum Laude, President's Honors List		

WORK EXPERIENCE

Caltech NASA Jet Propulsion Laboratory Intern (Full Time)	Jun – Sept 2025
• Developed RSVPLite telemetry backend to allow storage of Mars Sample Return mission telemetry in arbitrary databases, such as TimescaleDB or SQLite	
• Created experimental machine learning model for Perseverance rover slippage from overhead imagery and rover tilt data	
ANRE Technologies NASA Jet Propulsion Laboratory Intern (Full Time) Jun – Sept 2024	
• Continued to work on M2020 (Perseverance) Rover Simulation Software (RSVP Suite)	
• Developed custom stereo processing pipeline to experiment with usage of more advanced stereo matching algorithms in rover operations	
• Added optional Looking Glass support to enhance stereo viewer (QARD)	
ANRE Technologies NASA Jet Propulsion Laboratory Intern (Part Time)	Oct 2023 – Jun 2024
• Performed large scale codebase refactor to migrate from Qt4 signal connection semantics to Qt5, enhancing compile time error checks	
Caltech NASA Jet Propulsion Laboratory Intern (Full Time)	Jun – Sept 2023
• Worked to Develop and Maintain Mars Rover Simulation Software (RSVP Suite)	
• Ported simulation software from RedHat Enterprise Linux (RHEL) 7 to RHEL 8	
• Fixed major issues including crashing bugs, logic bugs, data format incompatibilities, and more	
• Developed new terrain searching features	
Versational Full-stack Software Developer	Jun – Sept 2021
• Assisted development of Deep Learning "Gems" identification models based on BERT	

REPRESENTATIVE PROJECTS

Full (uncurated) list at benjaminhinchliff.com/projects

MarsAnywhere: Diffusion for Satellite-to-Ground View Synthesis for Mars PyTorch, SpiceyPy
• Diffusion based machine learning model for synthesis of ground view mars imagery from satellite overhead imagery
• Dataset curated and processed from HiRISE Mars orbiter overhead imagery and Perseverance rover ground imagery
• Controlnet model based on Stable Diffusion 2.1 with overhead imagery projected as viewed from the ground as input
• Able to produce realistic ground view imagery for the Jezero crater region of Mars (where the Perseverance rover is)

BanjOS | C11, x86_64 Asm, GRUB Bootloader

- Minimal x86_64 operating system written from scratch targeting the QEMU emulator
- Supports features including: VGA console output, interrupts & interrupt driven keyboard & serial drivers, dynamic memory allocation with on-demand paging (physical, virtual, & kmalloc), cooperative multitasking, and Ext2 file reading

Reinforcement Learning Balatro Agent | PyTorch

- Prototype reinforcement learning agent for Balatro
- Based on an extended version Balatrobot botting framework for the Balatro game
- Communicates with a Pytorch model over websockets to send commands to Balatro
- Learned simple hand combinations and performed moderately better than baseline

SKILLS

Programming

- Arduino C++ & MicroPython - microcontroller programming
- Simulation and kinematics modeling Fundamentals
- Computer Science Fundamentals - e.g. Data Structures, Algorithms, Theory
- C, C++, Python, Haskell - Comfortable with a broad range of languages
- Web Development - JavaScript, React, Vue, Svelte, and jQuery

Tools/Others

- Scripting (Bash, Python), git, CI/CD (GitHub Actions & Jenkins), Linux/Unix, L^AT_EX, (n)vim, VS(Code)