Nithun Selva

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EDUCATION

Colby College, Waterville, ME — *Bachelor of Arts*, May 2025
Major: Computer Science: AI, Astrophysics — **GPA:** 4.00/4.00
Honors: Dean's List
Relevant Coursework: Neural Networks, Deep Learning, Advanced Computer Networks, Algorithm Design and Analysis, Computational Modeling and Simulation, Computer Hardware, Data Analysis and Visualization, Data Structures, Vector Calculus

EXPERIENCE

Research Assistant, *Colby Computer Science Department,* Waterville, ME — February 2023 - Present

- Leveraged Python and **TensorFlow** to design and simulate a network of **collaborative drone agents**
- Improved **task success rates** using advanced **reinforcement learning** algorithms like Proximal Policy Optimization (PPO)
- Tackled the **curse of dimensionality** by **limiting information sharing** to adjacent/local drone agents, achieving comparable performance to global sharing, optimizing code to enhance execution **speed and scalability**
- Co-authored a conference **paper submitted to ICCCN 2025** (under review)

Research Assistant, *Colby Astronomy Department,* Waterville, ME — February 2022 - Present

- Built **contrast-invariant vision models** to **classify galaxy morphologie**s across redshifts using James Webb Space Telescope (JWST) data, working with Prof. Dale Kocevski and the CEERS collaboration—being turned into an **Honors Thesis**
- Curated and manually classified an extensive **galaxy morphology dataset** from JWST for optimal model training, improving accuracy over existing Hubble-based classifications—to be made publicly available
- Integrated **JWST and Chandra X-Ray** Telescope data to assist in identifying new Active Galactic Nuclei (AGN) candidates
- Created **image pipelines** to calibrate, register and stack **scientific images** at the Colby Observatory, improving signal weight
- Migrated **15+ complex astronomical IDL scripts** to Python

Summer Research Assistant, *Colby Computer Science Department,* Waterville, ME — June 2024 - August 2024

- Engineered **text and image analysis solutions** for a digital archiving project with the Davis Institute for AI
- **Filtered 500+ magazine pages** to improve OCR accuracy for mixed traditional/simplified Chinese text and rectify scan issues
- Employed the OpenAI API and prompt engineering to integrate images and transcribed text to **generate descriptions and tags** for each magazine page
- Created a comprehensive list of identified objects/themes **enhancing the search functionality** and accessibility

PERSONAL PROJECTS

Chicly AI Fashion Extension (JavaScript, LangChain) — February 2025 - Present

- Developed an AI-powered browser extension to analyze users' clothes shopping cart and automatically **recommend complementary fashion pairings** from the same website
- Optimized **data retrieval** and used prompt engineering techniques, **reducing token usage by 75-90%**
- Implemented a Retrieval-Augmented Generation (**RAG**) system to enhance recommendation accuracy and personalization

Raspberry Pi AI Assistant (Python, PyTorch, C, Qt5) | GitHub — March 2024 - May 2024

- Developed a **privacy-centric voice assistant** leveraging open-source models from **HuggingFace** on a Raspberry Pi
- Implemented a **few-shot trained classifier** to intelligently recognize voice commands for features like a conversational AI, translation, note-taking/reminders and image generation
- Designed a user-friendly circular **touch GUI** for intuitive interaction and created a sleek, portable 3D-printed enclosure

FitsOpen (Swift, SwiftUI) — August 2023 - Present

- Developed an **iOS app** for analyzing **astronomical FITS images** and metadata on mobile devices
- Enabled real-time **viewing and editing** of astrophotography data, streamlining workflow for astronomers

MapColbyTrails (Swift, SwiftUI) | GitHub — July 2024 - Present

- Created an iOS navigation app using **MapKit** for the **Perkins Arboretum Trail System** at Colby College
- Integrated **GeoJSON overlays** for **real-time user tracking**, displaying trail lengths and difficulty levels

ACTIVITIES & LEADERSHIP

Colby College Office of International Programs, *Program Fellow*, Waterville, ME — May 2023 - Present

- Streamlined mentor-matching by using OpenAI API to **distill form responses**, dropping manual **evaluation time by 70%**
- Automated the flight/travel information database with the information of **170+ students**, improving accuracy and accessibility

SKILLS

- **Programming Languages:** Python, Swift, MATLAB, C/C++, VHDL, SQL, IDL, JavaScript, Java
- **AI/ML:** Reinforcement Learning, Computer Vision, Multimodal ML, LLMs, NLP, RAG, Agentic AI
- **Frameworks/Tools:** TensorFlow, PyTorch, OpenCV, JAX, CUDA, PIL, NumPy, SciPy, Git, Linux/Unix, KVM/QEMU, Arduino/IoT, Socket Programming, FPGA Design (Quartus), SketchUp 3D, PixInsight
- **Languages:** Tamil (native/bilingual), Hindi (elementary), Mandarin Chinese (elementary)