Aidan Burrowes

aidan.burrowes@gmail.com | (407) 925-6063 | Oviedo, FL | linkedin.com/in/aidanburrowes

Education

University of Florida, *Gainesville, FL* Expected May 2026

Bachelor of Science in Computer Science, Minors in Electrical Engineering and Physics
GPA 3.86/4.0, UF Honors Program

Activities: ColorStack – Mentor, Florida Quantum Computing Society – Program Officer, IEEE Signal Processing Society – Project Contributor, Society of Hispanic Professional Engineers – Member

Work Experience

Microsoft, *Redmond, WA* May 2024 – August 2024
Software Engineering Intern

- Enhanced Python tool to generate synthetic meeting conversation data, including audio and transcript
- Increased tool efficiency and consistency, allowing **4x longer audio output** with minimal context
- Elevated audio realism by introducing diverse speech patterns, accents, and multilingual capabilities
- Generated training, testing, and evaluation data for speech recognition models for various locales, **increasing the accuracy of subtitles and transcription** during Microsoft Teams meetings
- Produced performance/load testing data for **ChatGPT-4o** and **Azure multimodal LLMs**
- Streamlined the development process by configuring CI/CD pipelines with YAML in Azure DevOps

HumanAI, *Singapore, Singapore* May 2023 – July 2023
Software Engineer Intern

- Developed a Flutter mobile application, implementing a robust client-server architecture to connect users to a Node.js backend server, MongoDB database, and robotic chef on iOS and Android
- Spearheaded extensive UI/UX redesign using Figma for incoming interns to translate to application
- Innovated data retrieval via the caching of large files, **improving loading speeds by up to 100%**
- Deployed REST API to create end-to-end connection between mobile application and robotic chef
- Engineered a new mechanism for expedited ingredient drop, **reducing dropping time by 10 seconds**

Research Experience

Quantum Electronics and Spintronics Innovations, *Gainesville, FL* August 2024 – Present
Undergraduate Research Assistant

- Conduct research on skyrmion qubits via Qiskit simulations & fabrication to realize quantum effects
- Develop energy-efficient, scalable spintronic architectures for neuromorphic and quantum computing, with a focus on medical device integration for imaging and diagnostic applications

Data-Driven Humanities Research Group, *Gainesville, FL*
Undergraduate Researcher August 2023 – Present

- Utilize open-source APIs and data to develop a more accurate and robust Latin lemmatizer
- Leverage ML and NLP techniques to finetune an LLM to identify syntactic patterns in Latin texts
- Conduct extensive data preparation and **processed over 100,000 tokens** for syntactic analysis
- Achieved up to **98% accuracy** in predicting syntactic features (e.g. part of speech, tense, mood)

Undergraduate Research Assistant & Team Lead January 2023 – May 2023

- Led a five-person team to preprocess and augment data, mitigating the limitations of a small dataset
- Prepared data for sentiment analysis via tokenization techniques and sentiment aspect labeling
- Developed new Ancient Greek dataset generators, **resulting in a 50% increase in sentence variation**

Gator Glaciology, *Gainesville, FL* August 2023 – May 2024
Undergraduate Research Assistant

- Enhance GStatSim, a Python geostatistics package, using PyTorch & GPU acceleration
- Expedited the interpolation of Antarctic bed elevation maps by utilizing vectorization techniques, **resulting in a speed increase of over 400%** in kriging and sequential gaussian simulation

Skills

Languages | Python, Java, C++, TypeScript, JavaScript, SQL, MATLAB, Dart, HTML/CSS, VHDL, x86, LaTeX

Technologies | PyTorch, TensorFlow, Pandas, NumPy, Matplotlib, Node.js, Express.js, React, Flask, Flutter, Tkinter, Click, Azure DevOps, Figma, Blender, Linux, Git, XML, MongoDB, CockroachDB, AWS S3, OAuth 2.0

Projects

USAF Eglin AFB – Software Enabled Weapon, *Okaloosa County, FL* August 2024 – December 2024

Project description: an AI-driven, modular, software-based decision-making system to update parameters of autonomous agents and weapon systems in real-time

- Collaborated with a hand-selected cohort of undergraduate and graduate students in the Innovating for Defense course to address real-time, mission-critical Department of Defense (DoD) challenges
- Conducted 25+ interviews with stakeholders, including USAF pilots, AFRL engineers, defense contractors, gaining insights into hierarchical decision-making, algorithms, and dual-use technology
- Delivered weekly presentations to high-level DoD and defense contractor decision-makers, developing skills in communication, strategic thinking, and technical reporting
- Developed a Minimum Viable Product (MVP) using NVIDIA Isaac Lab—a physics-informed simulation framework exploring reinforcement learning integration and adaptive multi-agent behaviors

Melody Mimicry, *Gainesville, FL* October 2023 – December 2024

Project description: An AI song cover website – make any artist cover any song!

- Utilized Retrieval-based Voice Conversion to create a REST API for an AI song cover website
- Engineered a pipeline to automate the download of songs from YouTube, separate the instrumental and vocals, synthesize AI-generated vocals in the style of the user's chosen artist, and then recombine them with the original instrumental
- Implemented CockroachDB to manage a database of over 100,000 songs, enhancing user search experience through an autocomplete feature powered by the KMP algorithm and trie data structure

ChowNow, *Tampa, FL* March 2023 – May 2024

Project description: ChowNow is the perfect food app for college students who want to quickly find delicious and affordable meals between classes without having to wait a long time.

- Utilized Google Maps and Popular Times APIs to create a website tailored for recommending nearby restaurants based on food preferences, geographical location, busyness, and ratings
- Developed backend to facilitate user authentication, API integration, and the preference algorithm
- One of 12 winning projects of HackaBull 2023 at the University of South Florida

Publications

2D Spintronics for Neuromorphic Computing with Scalability and Energy Efficiency
Journal of Low Power Electronics and Applications March 24, 2025

Abstract: The demand for computing power has been growing exponentially with the rise of artificial intelligence (AI), machine learning, and the Internet of Things (IoT). This growth requires unconventional computing primitives that prioritize energy efficiency, while also addressing the critical need for…
doi: 10.3390/jlpea15020016

Performing sentiment analysis to trace the history of identity and belonging in ancient Greek literature
Digital Scholarship in the Humanities September 11, 2024

Abstract: This paper presents a Natural Language Processing approach for the in-depth study of ancient Greek literature. Specifically, our project mines the largest data collection of ancient Greek literature to extract descriptive words and their contextual collocations. We then present the Python libraries…
doi: 10.1093/llc/fqae048

Conferences

University of Florida's 25th Annual Spring Undergraduate Research Symposium April 2024
University of Florida's 26th Annual Spring Undergraduate Research Symposium April 2025
Florida Quantum Summit April 2025

Professional Service

Reviewer for Oxford University's Journal, Digital Scholarship in the Humanities — January 2025 – Present

Awards

Purdue Science B4PhD Scholar — March 2025
Selected as a Purdue Science B4PhD Scholar, a competitive program designed to support high-achieving undergraduate students from across the country who are exploring the path to a PhD in STEM

HSF Scholar 2024 — June 2024
Designation awarded to the top 8% of applicants to the Hispanic Scholarship Fund. Was further selected to receive a scholarship of $500 from Conagra Brands

HSF Scholar 2023 — June 2023
Designation awarded to the top 8% of applicants to the Hispanic Scholarship Fund. Was further selected to receive a scholarship of $500 from Bank of America Corporation

AI Scholar — April 2023
One of 35 Students selected to pursue AI-related research one-on-one with a faculty member on a self-selected project at the University of Florida and includes a stipend of $1,750

USF Hackathon Winner — March 2023
As part of a three-person team, developed one of 12 winning projects at HackaBull 2023, an annual hackathon at the University of South Florida

National Merit Finalist — February 2022
Scholarship awarded to the top 1% of U.S. high school students as determined by the National Merit Scholarship Qualifying Test. Also National African American & Hispanic Recognition Awardee

Certifications

Fundamentals of Deep Learning — February 2024
Issued by NVIDIA, Credential ID: caeb10c0b1c44ea8add1ffa873ef84e1