Noah Vaughan

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Experience

Butler Neuromodulatory Research Facility, *Computational Researcher* January 2023 – June 2025

- Conducted novel computational neuroscience research with large-scale datasets (10 TB+) of EEG time and spectral data for depression, ADHD, PTSD, and OCD
- Developed and maintained custom processing and analysis pipelines in Python and MATLAB for various datatypes including EEG, MRI, fitness tracker, and behavioral data
- Worked on development of an automated data validation and quality platform to reformat existing and future EEG data for easier analysis and collaboration
- Led operations for research projects totaling >$2M in federal government funding
- Worked directly with psychiatric patient populations, administering TMS treatment during research procedures
- Publications:
  - Dysfunctional oscillatory bursting patterns underlie working memory deficits in adolescents with ADHD
  - The Association between Oscillatory Burst Features and Human Working Memory Accuracy

Takachar Ltd., *Engineering Intern* December 2021 – February 2022

- Implemented computational model of novel thermodynamic process (oxygen-lean torrefaction) in Excel
- Collaborated closely with founder to prepare materials for applying for further early-stage funding

Lee Lab for Biomedical Optics, *Research Assistant* December 2021 – December 2022

- Received competitive funding award to finance student research on chemotherapy drug efficacy and functional medicine optimizations
- Collected imaging data (spectral domain OCT) and performed data analysis using MATLAB
- Developed custom incubator with Arduino using closed-loop control system to allow for long-duration (24-72 hours) scanning

Projects

Personal Portfolio Website, *TypeScript, React, Next.js, Tailwind CSS* February 2026

- Hand-coded personal portfolio website using TypeScript, Next.js 16, and Tailwind CSS
- Implemented a responsive layout with adaptive navigation supporting both desktop and mobile devices, as well as dark and light mode variations
- Built interactive photo gallery with lightbox functionality using yet-another-react-lightbox library

Incandescent, *Godot (GDScript, GDShader)* September 2024

- Designed and programmed a top-down 2D puzzle-adventure game for 1-week GBJAM 12 hackathon using the Godot engine
- Implemented dynamic lighting system using shader scripting, including dithering and player and objective-based lighting effects
- Designed and implemented visual assets and animations including player movement, special lighting abilities, and environmental objectives

Engineering Capstone Project, *Python, C (Arduino)* May 2023

- Worked on development of custom recording stethoscope device for use by pulmonologists to diagnose abnormal breath sounds
- Implemented breath sound diagnosis machine learning algorithm in Python, PyTorch using breath sound spectrograms
- Programmed Arduino microphone recording device
- Presented work at Northeast Bioengineering Conference, April 2023. "A Streamlined Platform for the Creation of a Powerful Breath Sound Database."

Education

Brown University, *Sc.B. Biomedical Engineering* December 2023

- Courses: Algorithms and Data Structures, Functional Programming, Computational Neural Dynamics
- Extracurriculars: Brown University Band General Manager, Calculus & Linear Algebra Tutor

Skills

Languages: Python, TypeScript, JavaScript, HTML / CSS, Java, MATLAB, C
Frameworks & Tools: React, Node.js, Next.js, Tailwind CSS, Vite, Git, AI/LLM APIs
Databases: PostgreSQL