Sam Williams

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Education & Research

M.S. Computer Science, Virginia Tech — January 2023 – December 2023

- **Thesis**: *Exploring the Usability of Non-verbal Vocal Interaction (NVVI) and a Pitch-based Implementation*
- **Relevant coursework**: Usability & User Experience Engineering, Database Management Systems, Warehouse Scale Computing, Network Architecture and Protocols

B.S. Computer Science, Virginia Tech — Fall 2019 – Fall 2022

- **Relevant coursework**: Data Structures and Algorithms, Data and Algorithm Analysis, Computer Systems, Software Reverse Engineering, Statistics for Engineers, Multimedia/Hypertext Capstone, Global Ethics

Research & Publications, Virginia Tech — Spring 2020 – Spring 2024

- **A Relative Pitch Based Approach to Non-verbal Vocal Interaction as a Continuous and One-Dimensional Controller** (Presented at HCII 2024)
- **An Approach to Pitch Based Implementation of Non-verbal Vocal Interaction** (Presented at IEEE VR 2024)
- **Immersive Technology in the Public School Classroom: When a Class Meets** (Presented at iLRN 2021)

Experience

Instructor of Record, Virginia Tech — January 2024 – May 2024

- **Taught** an introductory elective course on **Graphical User Interfaces, including:**
  - **GUI Programming** – concepts and technologies like MVC, event-based programming, modularity, React, MUI, etc.
  - **Computer Graphics** – frameworks and libraries like coordinate systems, transformations, SVG, WebGL, D3, etc.
  - **Full-stack Development** – MERN stack web application development (MongoDB, Express, React, Node, REST API).
- **Developed classwork material** and **delivered lectures** in a fast-paced environment to a class of 70 students.
- **Supervised TAs** – organized weekly meetings, instructed office hours and grading procedures, considered feedback.

Graduate Teaching Assistant, Virginia Tech — January 2023 – December 2023

- **Assisted students in office hours and graded** in the following courses:
  - **Graphical User Interfaces** (as described above)
  - **Intro to Computer Systems** – The C programming language, low-level programming, memory management.

Web/Asset Developer, StemPlus — Part-time, May 2020 – December 2022

- **Maintained company website** as a **front-end developer** (WordPress + HTML/JS/CSS).
- **Created 3D assets** for virtual reality-based social and educational experiences (Blender, Mozilla Hubs).
- **Produced proprietary video content,** e.g., programming tutorial videos, e-learning content, production logos.
- **Advised on market needs and gaps** to help expand business and direct company niches.

Software Engineer, ARIES Program, Virginia Tech Libraries — May 2021 – August 2021

- **Developed a web-application** for desktop and Virtual Reality devices (Three.js, GitHub).
- **Collaborated with UX designers** to translate user interface mockup to GUI (Figma, JavaScript).

Projects

- **AirShare** – Cross-platform/device real-time file sharing web application implemented with Next.js and WebRTC.
- **Mepository** – Web-based virtual journal for recording and grouping entries based on days, weeks and months.
- **Audio Plugin Sandbox** – Quickly prototype audio plugins in a web-application sandbox environment.
- **X86 ASM Sandbox/Debugger** – Debug assembly programs with breakpoints and stack and memory visualizations.
- **Fourier Transform Calculator and Analysis** – Real-time audio visualizations with DFT and FFT calculations website.
- **VST Production** – Audio plugin development, e.g., pitch and timbre shifting, filtering and compression.

Skills

Programming Languages	• JavaScript, C, C++, C#, Python, SQL, Java, Rust, x86 ASM, PHP
Concepts	• UX, Agile Methodologies, Model-View-Controller, Modularity, Abstraction, Automation, Sprints, CI/CD, Full-stack Development, Audio/Digital Signal Processing, Unit Testing, Web Scraping, Cloud Computing, Real-time Processing
Technologies	• GitHub, Web Technologies (HTML/JS/CSS/DOM), React.js, Express.js, Next.js, Node.js, MySQL, MongoDB, Unity3D, Three.js, WebGL, D3, REST APIs, Notebooks