

# Sam Williams

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## Education & Research

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### 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

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### 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, utilized 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

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- 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

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Programming Languages • JavaScript, C, C++, C#, Python, SQL, Java, Rust, x86 ASM, PHP

Concepts • GUI, UX, Agile Methodologies, Model-View-Controller, CI/CD, Full-stack, Audio/Digital Signal Processing, Unit Testing, Web Scraping, Cloud Computing, Real-time Processing

Technologies • Visual Studio, GitHub, Web Technologies (HTML/JS/CSS/DOM), Linux, .NET/Windows, React.js/Next.js, Node.js, MySQL, MongoDB, Unity3D, Three.js, WebGL, D3, REST APIs, Notebooks, DAWs