

Sam Williams

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EDUCATION & ORGANIZATIONS

- **B.S. in Computer Science | Virginia Tech '22**
 - Summa cum laude
 - Phi Beta Kappa Academic Honor Society
- **M.S. in Computer Science | Virginia Tech '23**
 - Thesis: *"Exploring the Usability of Non-verbal Vocal Interaction (NVVI) and a Pitch Based Implementation"*
- **Galileo Engineering Living and Learning Community | Virginia Tech | 2019-2020**
- **Up & Up | Virginia Tech | 2023**
 - Music event scheduling and hosting, community outreach, and sound equipment management

WORK EXPERIENCE

Software Developer and Content Designer | STEM+ | Alexandria, VA | 2020 – 2022

Developed computer science and programming educational content. Created and supervised virtual reality environments for learning and social events. Designed and maintained company website.

Virtual Reality Developer | Virginia Tech Libraries | Blacksburg, VA | 2021

Designed a 3D virtual reality environment to visualize 3D animal anatomy for classroom use, implemented for both the Oculus Quest and web browsers.

Educator | Virginia Tech | Blacksburg, VA | 2023 – 2024

Instructor (Spring 2024) for *Intro to GUI* (introduction to GUIs, model-view controller, React and D3.) Teaching assistant for *Intro to Computer Organization* (basics of systems and the C programming language) and for *Intro to GUI* (Fall 2023)

Research & Publications | Virginia Tech | Blacksburg, VA | 2019 –

- *A Relative Pitch Based Approach to Non-verbal Vocal Interaction as a Continuous and One-Dimensional Controller*
 - To be presented & appear at HCII 2024
- *An Approach to Pitch Based Implementation of Non-verbal Vocal Interaction (NVVI)*
 - Presented at IEEE VR (NIDIT Workshop) 2024
- *Immersive Technology in the Public School Classroom: When a Class Meets*
 - Presented at iLRN 2021 (Virtual)
 - doi.org/10.23919/ilrn52045.2021.9459371
- *Redefining the Digital Paradigm for Virtual Museums*
 - LNISA 2021
 - dx.doi.org/10.1007/978-3-030-77411-0_23

PROJECTS

Online Tools, Visualizations and Environments (available on my website)

- **Fourier Transform Calculator and Analysis Tool** for calculations and visualizations.
- **Audio Plugin Development Workstation** for quick prototyping of audio plugins.
- **x86 ASM Sandbox and Debugger** providing the capabilities to visualize and manipulate the stack and memory of an Intel IA-32 ASM program.
- **Image Convolution Sandbox** – perform convolutions like blurring and edge detection on any image with custom kernels.

Virtual Studio Technology (VST) Development of audio plugins for digital audio workstations.

SKILLS AND TECHNICAL BACKGROUND

- C, C++, C#, Java, JavaScript, Python, X86 ASM
- Web Development, GUI, DOM, HTML, CSS, React, D3
- Unity3D, Three.js, WebGL, OpenGL
- User Experience (UX), User Interfaces (UI), Human-Computer Interaction (HCI)
- Software Engineering Design Patterns, Model-View-Controller, Modularity, Agile development
- Visual Studio, VSCode, Git/Github, Microsoft Excel
- Audio Signal Processing, DSP, Sound Acoustics