



JOSH URBAN DAVIS

EXPERIENCE AND SELECT TECHNICAL PROJECTS

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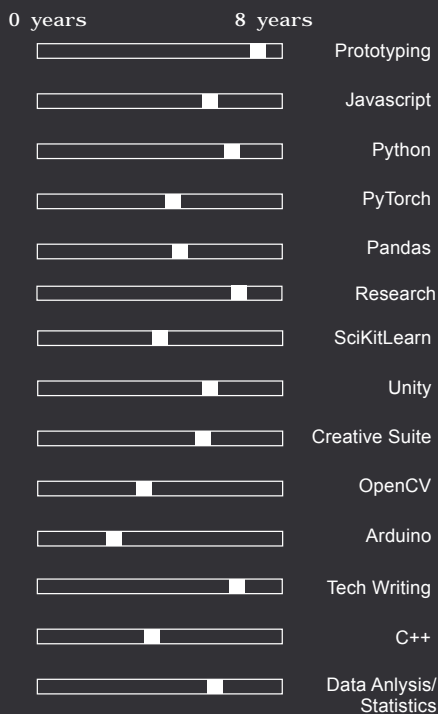
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EDUCATION

PHD: COMPUTER SCIENCES

2023 - Dartmouth College

SKILLS



The scale depicted indicates the range of expertise for each skill, spanning from 0 to 8 years of experience.

PATENTS

- (Calliope) A System for Supporting Human-AI Collaboration in Virtual Environments.
Josh Urban Davis, Fraser Anderson, George Fitzmaurice. (Pending, No. 076/0301)
- (Circuit Style) A System for Peripherally Reinforcing Best Practices in Hardware Computing.
Josh Urban Davis, Jun Gong, Xing-Dong Yang (No. 62/916,977)
- (TangibleCircuits) A System for Converting Circuit Diagrams to Tangible and Audio Interfaces.
Josh Urban Davis, Xing-Dong Yang (No. 61/030,441)

MEDIA AUGMENTED VIDEO CONFERENCING

ADOBE RESEARCH | Research Intern | 2021-2022

- Led the development of a cutting-edge media augmented video conferencing system that leveraged gesture and speech detection to deliver immersive experiences in a mixed-reality environment. Utilized a powerful stack including Javascript, MediaPipe, and OpenCV to independently prototype the system.
- Successfully collaborated to seamlessly integrate the independently developed project into a larger media authoring software product.
- Designed and executed comprehensive mixed-method qualitative and quantitative studies involving 46 users to gather valuable insights and user feedback. Effectively presented the study results to key stakeholders within the company, translating research findings into actionable recommendations.
- Published research findings in peer-reviewed proceedings, showcasing a commitment to contributing to the scientific community and advancing knowledge in the field of human-computer interaction.

MIXED-REALITY MASK | MICROSOFT RESEARCH | Research Intern | 2020

- Developed and implemented an interactive mask using a smartphone to display real-time video of the user's mouth and nose on the mask's surface.
- Created real-time mapping techniques to ensure accurate and distortion-free visualization.
- Fostered collaborations between research team and commercial partners to transition the prototype into a marketable product.
- Published the mask design in peer-reviewed proceedings (<http://hdl.handle.net/10125/79732>)

GENERATIVE AI FOR AUTHORIZING 3D GEOMETRIES IN VR

AUTODESK RESEARCH | Graphics Research Intern | 2020

- Spearheaded collaboration with the Machine Learning, HCI/Graphics, and Generative Design research teams to pioneer cutting-edge techniques for generating 3D objects. Leveraged state-of-the-art technologies such as GANs, Transformers, and Autoencoders to develop innovative solutions.
- Prototyped and deployed interactive generative adversarial networks (GANs) specifically tailored for 3D design tasks in virtual reality. Utilized a powerful tech stack including pyTorch, Pandas, Numpy, and Unity to create immersive and user-friendly generative AI authoring experiences.
- Recognized for intellectual contributions and innovation by securing a patent for virtual reality interaction techniques and system design. Published technical paper in prestigious, peer-reviewed science proceedings. (doi.org/10.1145/3450741.3465260)

RESEARCHER | Dartmouth Computer Sciences | 2018 - Present

- Developed advanced inductive sensing systems capable of accurately distinguishing between various objects by utilizing ensemble learning techniques.
- Established strategic partnerships with the Kelley Center for the Blind to implement technologies which enabled visually impaired users to access electrical engineering and STEAM education.
- Played an integral role in grant writing efforts and contributed to the publication of 14 technical papers in peer-reviewed journals and proceedings. Recieved 4 best paper awards for outstanding research.
- Served as a mentor to undergraduate and master's students from diverse disciplines, providing guidance and support in cross-departmental projects, fostering collaborative learning and professional development.

BRAIN COMPUTER INTERFACE FOR MUSIC GENERATION | 2018

Collaborated with Geisell School of Medicine to prototype and deploy a Brain-Computer Interface (BCI) system that mapped functional magnetic resonance imaging (fMRI) data to electroencephalogram (EEG) signals. Developed hyperalignment and signal processing techniques to enable the isolation of psycho-acoustic music recall, allowing users to generate small melodies through their thoughts.

BIO-FEEDBACK VIRTUAL REALITY | 2017

Collaborated with the Space Medicine Laboratory and NASA to develop a prototype system that utilized sensor data to infer user stress levels and dynamically adjusted audio and visual content in VR to alleviate stress. The system underwent rigorous testing with live users over a 9-month period, focusing on assessing whether these tools and media could effectively alleviate the stress associated with a mission trip to Mars.