Joshua Urban Davis

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PROFESSIONAL EXPERIENCE

META | REALITY LABS, **Menlo Park, CA**
Research Scientist *Current Position*

- Research, design, and develop **computer vision and machine learning algorithms** for light estimation and virtual object rendering applied to AR, VR, and MR.
- Research, design, and develop applied color perception algorithms for camera and AR applications including **metric development** and **key performance indicator evaluation** pipelines
- Develop camera calibration and algorithms for **3D surface reconstruction and semantic scene understanding**.
- Implement and support **large dataset generation** and processing for algorithm development (AI/ML) in new technology explorations. Integrate **SLAM, pix2pix, and SIFT** algorithms for novel lighting estimation.
- Owned project initiatives and drove cross team collaborations

ADOBE RESEARCH **San Jose, CA**
Research Assistant *2021 - 2022*

- Led the development of a cutting-edge media augmented video conferencing **creativity tool** that leveraged **body pose recognition, gesture and speech detection** to deliver immersive experiences.
- Utilized a powerful stack including **Python, Javascript, MediaPipe, and OpenCV** to independently prototype the system.
- 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.
- Optimized models for **on-device object detection and 3D human understanding**

MICROSOFT RESEARCH **Redmond, WA**
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** for accurate and distortion-free visualization and optimized for **on-device model inference**.
- Fostered collaborations between research team and commercial partners to transition prototype into a marketable product.
- Published the mask design in peer-reviewed proceedings (http://hdl.handle.net/10125/79732)

AUTODESK RESEARCH **Toronto, ON**
Research Intern *2019*

- Spearheaded collaboration with the Machine Learning, HCI/Graphics, and Generative Design research teams to pioneer cutting-edge techniques for **authoring 3D objects using generative AI** in VR. 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)

EDUCATION

DARTMOUTH COLLEGE **Hanover, NH**
Doctorate of Computer Sciences

PATENTS & ADDITIONAL SKILLS

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