

David Li

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EDUCATION

University of Maryland, College Park

Ph.D. Candidate in Computer Science

Aug. 2019 - Expected May 2024

M.S. in Computer Science

Aug. 2019 - Dec. 2021

B.S. in Computer Science and Mathematics (Magna Cum Laude)

Aug. 2015 - Dec. 2018

EXPERIENCE

UMD Graphics and Visual Informatics Laboratory

Apr. 2019 - Present

Graduate Research Assistant

- Developed *MeteoVis*, an interactive VR system for visualizing water vapor, wind, and cloud height data. Programmed in Unity using C# and HLSL GPU shaders. Published in ACM CHI EA 2020.
- Led a group of students to create a foveated 360 video streaming pipeline which optimizes video streaming by transmitting a reduced-resolution video that gets upscaled on the client. Programmed in C++ and OpenCL. Published in IEEE TVCG (VR 2021).
- Created *Progressive Multi-Scale Light Field Networks* which encodes several resolutions of a light field into a single neural network to optimize LFN streaming and rendering. Published in 3DV 2022.
- Created *Continuous Levels of Detail for Light Field Networks* to enable more granular adaption and smoother transitions for LFNs. Programmed in Python with PyTorch. Published in BMVC 2023.

Google Cloud

June 2021 - Aug. 2021

Software Engineering Intern

- Developed a library that generates 3D document models and renders them with visual effects.
- Generated synthetic path-traced document images and conducted evaluations to quantify the accuracy improvements gained by training bounding box detectors on synthetic document images.
- Programmed in Python using the Blender Python API and Apache Beam.
- Worked in Google Cloud AI on the Data Synthesis team.

Google AR

May 2020 - Aug. 2020

Software Engineering Intern

- Developed *OmniSyn*, a deep learning-based view synthesis pipeline for interpolating between 360 panoramas published as a poster in IEEE VRW 2022. Programmed in Python using PyTorch.
- Collected simulated RGB, depth, and pose data from the CARLA self-driving car simulator.
- Implemented a gesture demo for controlling two virtual lamps based on 6DoF AR phone pose using JavaScript, three.js, and WebXR.

UMD Graphics and Visual Informatics Laboratory

May 2018 - Dec. 2018

Undergraduate Research Assistant

- Codeveloped *Geollery*, a mixed reality social media platform featuring real-time user interaction and geotagged social media.
- Wrote JavaScript, PHP, and GLSL code using three.js for 3D development and WebSockets for real-time communication. Coauthored publications in ACM CHI 2019, IEEE VR 2019, and ACM Web3D 2019.

TECHNICAL SKILLS

Projects: See <https://davidl.me/projects>

Programming: C++, JavaScript, Python

PUBLICATIONS

David Li, Brandon Y. Feng, and Amitabh Varshney. Continuous Levels of Detail for Light Field Networks. In British Machine Vision Conference 2023 (BMVC 2023)

Ananta Narayanan Balaji, Clayton Kimber, **David Li**, Shengzhi Wu, Ruofei Du, and David Kim. RetroSphere: Self-Contained Passive 3D Controller Tracking for Augmented Reality. In Proc. ACM Interact. Mob. Wearable Ubiquitous Technol. (IMWUT 2023)

David Li, and Amitabh Varshney. Progressive Multi-Scale Light Field Networks. In 2022 International Conference on 3D Vision (3DV 2022)

David Li, Yinda Zhang, Christian Häne, Danhang Tang, Amitabh Varshney, and Ruofei Du. OmniSyn: Synthesizing 360 Videos with Wide-baseline Panoramas. In 2022 IEEE Conference on Virtual Reality and 3D User Interfaces Workshops and Abstracts (VRW 2022)

David Li, Hanan Samet, and Amitabh Varshney. Visualizing Accessibility With Choropleth Maps. In Proceedings of the 5th ACM SIGSPATIAL International Workshop on Location-based Recommendations, Geosocial Networks and Geoadvertising (LocalRec 2021)

David Li, Ruofei Du, Adharsh Babu, Camelia Brumar, and Amitabh Varshney. A Log-Rectilinear Transformation for Foveated 360-degree Video Streaming. In 2021 IEEE Transactions on Visualization and Computer Graphics Special Issue on the 2021 IEEE VR Conference. (TVCG 2021)

David Li, Eric Lee, Elijah Schwelling, Mason Quick, Patrick Meyers, Ruofei Du, and Amitabh Varshney. MeteoVis: Visualizing Meteorological Events in Virtual Environments. In Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems. (CHI EA 2020)

Ruofei Du*, **David Li***, and Amitabh Varshney. Project Geollery.com: Reconstructing A Live Mirrored World With Geotagged Social Media. In Proceedings of the 24th International Conference on Web3D Technology. (Web3D 2019)

Ruofei Du, **David Li**, and Amitabh Varshney. Geollery: A Mixed Reality Social Media Platform. In Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems. (CHI 2019)

Ruofei Du, **David Li**, and Amitabh Varshney. Experiencing a Mirrored World With Geotagged Social Media in Geollery. In Extended Abstracts of the 2019 CHI Conference on Human Factors in Computing Systems. (CHI EA 2019)

Ruofei Du*, **David Li***, and Amitabh Varshney. Interactive Fusion of 360° Images for a Mirrored World. In 2019 IEEE Conference on Virtual Reality and 3D User Interfaces. (VR 2019)

AWARDS

TVCG Honorable Mention at IEEE VR 2021 for *A Log-Rectilinear Transformation for Foveated 360-degree Video Streaming*

Dean's Fellowship (2019)

ACTIVITIES

Reviewer for IEEE VR (2020-23), IEEE ISMAR (2021, 2023) ACM CHI LBW (2020-21), IEEE TCSVT (2022),