DAVID LI

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SUMMARY

Computer graphics and vision engineer with experience spanning machine learning, data synthesis, VR data visualization, GPU programming, and 3D web development.

EXPERIENCE

Software Engineer

Google AR & VR

June 2024 - Present Mountain View, CA

- Developing real-time perception and graphics algorithms and software in C++ and Unity.

Graduate Research Assistant

UMD Graphics and Visual Informatics Laboratory

April 2019 - May 2024 College Park, MD

- Created *Continuous Levels of Detail for Light Field Networks* to enable more granular adaption and smoother transitions for LFNs. Programmed with PyTorch. Published in BMVC 2023 [2].
- Created *Progressive Multi-Scale Light Field Networks*, which encodes several resolutions of a light field into a single neural network for streaming. Published in 3DV 2022 [4].
- Created a foveated 360 video streaming pipeline, which optimizes video streaming for virtual reality headsets. Programmed in C++ and OpenCL. Published in IEEE TVCG 2021 [7] and won a TVCG Honorable Mention award.
- 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 as a Late Breaking Work in ACM CHI 2020 [8].

Software Engineering Intern

Google Cloud

June 2021 - August 2021 Remote

- Developed a library that generates 3D document models and renders them with visual effects using the Blender Python API.

Software Engineering Intern

Google AR

May 2020 - August 2020 Remote

- Developed *OmniSyn*, a deep learning-based view synthesis pipeline for interpolating between 360 panoramas [5].

Undergraduate Research Assistant

UMD Graphics and Visual Informatics Laboratory

May 2018 - December 2018 College Park, MD

- Co-developed *Geollery*, a mixed reality social media platform featuring real-time interaction and geotagged social media.

EDUCATION

PhD in Computer Science

University of Maryland, College Park

Aug. 2019 - May 2024

Dissertation: *Towards Immersive Streaming for Videos and Light Fields*
Advised by Professor Amitabh Varshney.

MS in Computer Science

University of Maryland, College Park

Aug. 2019 - Dec. 2021 3.97 GPA

BS in Computer Science and Mathematics

University of Maryland, College Park

Aug. 2015 - Dec. 2018 3.97 GPA
Magna Cum Laude

AWARDS

TVCG Honorable Mention
Honorable Mention at IEEE VR 2021 for research on foveated 360-degree video streaming.

IMWUT Distinguished Paper Award
RetroSphere, a passive 3D controller project led by Ananta Balaji, received the IMWUT DPA at UbiComp 2023.

Dean's Fellowship
Received Dean's Fellowship in 2019 with UMD CS PhD admission.

SKILLS

Programming Languages

C++ | JavaScript | Python

Tools and Frameworks

Git | Docker | Kubernetes

ACTIVITIES

Reviewer

IEEE VR | IEEE ISMAR | IEEE TCSVT | IEEE TII | Virtual Reality (Springer) | ACM CHI LBW | ACM UIST

PUBLICATIONS

See https://davidl.me/papers for PDF download links.

[1] Jonathan Heagerty, Sida Li, Eric Lee, Shuvra Bhattacharyya, Sujal Bista, Barbara Brawn, Brandon Y. Feng, Susmija Jabbireddy, Joseph JaJa, Hernisa Kacorri, **David Li**, Derek Yarnell, Matthias Zwicker, and Amitabh Varshney. "HoloCamera: Advanced Volumetric Capture for Cinematic-Quality VR Applications". In: *IEEE Transactions on Visualization and Computer Graphics* (2024), pp. 1–9. DOI: 10.1109/TVCG.2024.3372123.

[2] **David Li**, Brandon Yushan Feng, and Amitabh Varshney. "Continuous Levels of Detail for Light Field Networks". In: *34th British Machine Vision Conference 2023, BMVC 2023, Aberdeen, UK, November 20-24, 2023*. BMVA, 2023. URL: https://papers.bmvc2023.org/0139.pdf.

[3] 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.* 6.4 (Jan. 2023). DOI: 10.1145/3569479.

[4] **David Li** and Amitabh Varshney. "Progressive Multi-Scale Light Field Networks". In: *2022 International Conference on 3D Vision (3DV)*. 2022, pp. 231–241. DOI: 10.1109/3DV57658.2022.00035.

[5] **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 Abstracts and Workshops (VRW)*. 2022, pp. 670–671. DOI: 10.1109/VRW55335.2022.00186.

[6] **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 '21. Beijing, China: Association for Computing Machinery, 2021. DOI: 10.1145/3486183.3492801.

[7] **David Li**, Ruofei Du, Adharsh Babu, Camelia D. Brumar, and Amitabh Varshney. "A Log-Rectilinear Transformation for Foveated 360-degree Video Streaming". In: *IEEE Transactions on Visualization and Computer Graphics* 27.5 (2021), pp. 2638–2647. DOI: 10.1109/TVCG.2021.3067762.

[8] **David Li**, Eric Lee, Elijah Schwelling, Mason G. Quick, Patrick Meyers, Ruofei Du, and Amitabh Varshney. "MeteoVis: Visualizing Meteorological Events in Virtual Reality". In: *Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems*. CHI EA '20. Honolulu, HI, USA: Association for Computing Machinery, 2020, pp. 1–9. DOI: 10.1145/3334480.3382921.

[9] Ruofei Du, **David Li**, and Amitabh Varshney. "Project Geollery.com: Reconstructing A Live Mirrored World With Geotagged Social Media". In: *The 24th International Conference on 3D Web Technology*. Web3D '19. LA, CA, USA: Association for Computing Machinery, 2019, pp. 1–9. DOI: 10.1145/3329714.3338126.

[10] 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, pp. 900–901. DOI: 10.1109/VR.2019.8798187.

[11] 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 '19. Glasgow, Scotland Uk: Association for Computing Machinery, 2019, pp. 1–13. DOI: 10.1145/3290605.3300915.

[12] 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 '19. Glasgow, Scotland Uk: Association for Computing Machinery, 2019, pp. 1–4. DOI: 10.1145/3290607.3313273.