Yu Ji

CONTACT INFORMATION

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Homepage: https://yeauxji.github.io

RESEARCH INTERESTS

Computational Imaging, and **3D Vision** with particular interests in geometry & appearance capture, physical-based reconstruction, imaging hardware & software, low level vision (calibration, image restoration and enhancement, etc.), VR/AR, and image-based rendering.

EDUCATION

University of Delaware, Newark, DE USA

Ph.D. in Computer Science **Jan 2011 - Dec 2015**

- Ph.D. Thesis: Coded Light Source for Recovering "Invisible" Phenomena
- Advisor: Dr. Jingyi Yu

Nanyang Technological University, Singapore

MSc. in Computer Engineering **Aug 2009 - Dec 2010**

- Master Thesis: 3D Mesh Editing Using Manifold Harmonics
- Advisor: Dr. Ying He

Huazhong University of Science and Technology, Wuhan China

B.Eng. in Electronics and Information Engineering **Sep 2005 - Jun 2009**

INDUSTRIAL EXPERIENCE

LightThought, Fairfax, VA USA

Head of Technology **Jan 2024 - Present**

- Developing novel imaging systems.

Tencent Pixel Lab, New York, NY USA

Principal Researcher **Apr 2022 - Jan 2024**

- Lead a research team working on 3D Reconstructions, 3D GenAI projects and VR/AR hardware devices. Transfer research ideas into production.

DGene Lab, Baton Rouge, LA USA

Chief Scientist **Jan 2018 - Jan 2022**

- Lead a research & development group. Develop and build algorithm and system for high precision 3D human Reconstruction.

DGene (Plex-VR), Santa Clara, CA USA

Principal Scientist **Apr 2017 - Dec 2017**

- Worked on computational photography and 3D Reconstruction. Develop and build a 3D capture dome for high precision human 3D reconstruction.

Publications

Journals

[J1] Xinyuan Li, Yu Guo, Yubei Tu, **Yu Ji**, Yanchen Liu, Jinwei Ye, and Changxi Zheng. "Textureless Deformable Object Tracking with Invisible Markers", *IEEE Transactions on Pattern Analysis and Machine Intelligence, SI:ICCP (***PAMI***)*, 2024.

[J2] Yuqi Ding, **Yu Ji**, Zhang Chen, Mingyuan Zhou, Sing Bing Kang and Jinwei Ye. "Polarimetric Helmholtz Stereopsis", *IEEE Transactions on Pattern Analysis and Machine Intelligence (***PAMI***)*, 2024.

[J3] Yuqi Ding, Zhong Li, Zhang Chen, **Yu Ji**, Jingyi Yu, and Jinwei Ye. "Full-Volume 3D Fluid Flow Reconstruction with Light Field PIV", *IEEE Transactions on Pattern Analysis and Machine Intelligence (***PAMI***)*, 2023.

[J4] Yuqi Ding, Zhang Chen, **Yu Ji**, Jingyi Yu, and Jinwei Ye. "Light Field-Based Underwater 3D Reconstruction Via Angular Resampling", *IEEE Transactions on Computational Imaging (***TCI***)*, 2023.

[J5] Mingyuan Zhou, Yuqi Ding, **Yu Ji**, Jingyi Yu, and Jinwei Ye. "Shape and Reflectance Reconstruction Using Concentric Multi-Spectral Light Field", *IEEE Transactions on Pattern Analysis and Machine Intelligence, SI:ICCP (***PAMI***)*, 2020.

[J6] Wei Yang, Yingliang Zhang, Jinwei Ye, **Yu Ji**, Mingyuan Zhou, Zhong Li and Jingyi Yu. "Structure from Motion on XSlit Cameras", *IEEE Transactions on Pattern Analysis and Machine Intelligence (***PAMI***)*, 2019.

[J7] Jinwei Ye, **Yu Ji**, Mingyuan Zhou, Sing Bing Kang and Jingyi Yu. "Content Aware Image Pre-Compensation", *IEEE Transactions on Pattern Analysis and Machine Intelligence (***PAMI***)*, 2018.

[J7] Nianyi Li, Jinwei Ye, **Yu Ji**, Haibin Ling and Jingyi Yu. "Saliency Detection on Light Field", *IEEE Transactions on Pattern Analysis and Machine Intelligence (***PAMI***)*, 2016.

Conferences

[C1] Yufan Zhang, **Yu Ji**, Yu Guo and Jinwei Ye. "Seeing A 3D World in A Grain of Sand", *the IEEE/CVF Conference on Computer Vision and Pattern Recognition (***CVPR***)*, 2025.

[C2] Yuqi Ding, **Yu Ji** and Jinwei Ye. "Polar-Photometric Stereo Under Natural Illumination", *the International Conference on 3D Vision (***3DV***)*, 2022.

[C3] Yuqi Ding, **Yu Ji**, Mingyuan Zhou, Sing Bing Kang and Jinwei Ye. "Polarimetric Helmholtz Stereopsis", *the International Conference on Computer Vision (***ICCV***)*, 2021. Oral Presentation.

[C4] Zhong Li, **Yu Ji**, Jingyi Yu, and Jinwei Ye. "3D Fluid Flow Reconstruction Using Compact Light Field PIV", *the European Conference on Computer Vision (***ECCV***)*, 2020.

[C5] Zhang Chen, Anpei Chen, Guli Zhang, Chengyuan Wang, **Yu Ji**, Kyros Kutulakos, and Jingyi Yu. "A Neural Rendering Framework for Free-Viewpoint Relighting", *the IEEE/CVF Conference on Computer Vision and Pattern Recognition (***CVPR***)*, 2020.

[C6] Zhang Chen, **Yu Ji**, Mingyuan Zhou, Singbing Kang, and Jingyi Yu. "3D Face Reconstruction using Color Photometric Stereo with Uncalibrated Near Point Lights", *the International Conference on Computational Photography (***ICCP***)*, 2020.

[C7] Jie Lu, **Yu Ji**, Jingyi Yu, and Jinwei Ye. "Mirror Surface Reconstruction Using Polarization Field", *the International Conference on Computational Photography (***ICCP***)*, 2019.

[C8] Shi Jin, Ruiyang Liu, **Yu Ji**, Jinwei Ye and Jingyi Yu. "Learning to Dodge A Bullet: Concyclic View Morphing via Deep Learning", *the European Conference on Computer Vision (***ECCV***)*, 2018.

[C9] Zhong Li, **Yu Ji**, Wei Yang, Jinwei Ye and Jingyi Yu. "Robust 3D Human Motion Reconstruction Via Dynamic Template Construction", *the International Conference on 3D Vision (***3DV***)*, 2017.

[C10] Wei Yang†, **Yu Ji**†, Sing Bing Kang and Jingyi Yu. "Ambient Occlusion via Compressive Visibility Estimation". *the IEEE Conference on Computer Vision and Pattern Recognition (***CVPR***)*, 2015.

[C11] **Yu Ji**, Jinwei Ye and Jingyi Yu. "Depth Reconstruction from the Defocus Effect of an XSlit Camera". *Computational Optical Sensing and Imaging (COSI), Optical Society of America*, 2015.

[C12] Jinwei Ye, **Yu Ji**, Wei Yang and Jingyi Yu. "Depth-of-Field Analysis and Coded Aperture Imaging on XSlit Cameras". *the European Conference on Computer Vision (***ECCV***)*, 2014. Oral Presentation. [Acceptance Rate: 2.63%]

[C13] Wei Yang, **Yu Ji**, Jinwei Ye, S. Susan Young and Jingyi Yu. "Coplanar Common Points in Non-Centric Cameras". *the European Conference on Computer Vision (***ECCV***)*, 2014. [Acceptance Rate: 25.06%]

[C14] **Yu Ji**, Jinwei Ye, Sing Bing Kang and Jingyi Yu. "Image Pre-compensation: Balancing Contrast and Ringing". *the IEEE Conference on Computer Vision and Pattern Recognition (***CVPR***)*, 2014. [Acceptance Rate: 29.88%]

[C15] Nianyi Li, Jinwei Ye, **Yu Ji**, Haibin Ling and Jingyi Yu. "Saliency Detection on Light Fields". *the IEEE Conference on Computer Vision and Pattern Recognition (***CVPR***)*, 2014. [Acceptance Rate: 29.88%]

[C16] Jinwei Ye, **Yu Ji** and Jingyi Yu. "A Rotational Stereo Model Based on XSlit Imaging". *the International Conference on Computer Vision (***ICCV***)*, 2013. Oral Presentation. [Acceptance Rate: 2.52%]

[C17] **Yu Ji**, Jinwei Ye and Jingyi Yu. "Reconstructing Gas Flows Using Light Paths Approximation". *the IEEE Conference on Computer Vision and Pattern Recognition (***CVPR***)*, 2013. Oral Presentation. [Acceptance Rate: 3.2%]

[C18] Jinwei Ye, **Yu Ji** and Jingyi Yu. "Manhattan Scene Understanding Via XSlit Imaging". *the IEEE Conference on Computer Vision and Pattern Recognition (***CVPR***)*, 2013. [Acceptance Rate: 25.2%]

[C19] Jinwei Ye†, **Yu Ji**†, Feng Li and Jingyi Yu. "Angular Domain Reconstruction of Dynamic 3D Fluid Surfaces". *the IEEE Conference on Computer Vision and Pattern Recognition (***CVPR***)*, 2012. [Acceptance Rate: 24%]

[C20] Yuanyuan Ding, Feng Li, **Yu Ji** and Jingyi Yu. "Dynamic 3D Fluid Surface Acquisition Using a Camera Array". *the International Conference on Computer Vision (***ICCV***)*, 2011. [Acceptance Rate: 20.5%]

Preprints Arxiv/Demo

[P1] Yanchen Liu, **Yu Ji**, Minghui Zhao, Xiaofan Jiang, Xia Zhou and Changxi Zheng. "Seamless High-Speed Optical Communication for Mobile Wide-Area Using Diffused Infrared Laser", *Information Processing in Sensor Networks (***IPSN***)*, 2023. **Best Demo Award**.

† co-first author

Services

- Conference Reviewer: CVPR, ICCV, ECCV, 3DV, ICIP, PG, etc.
- Journal Reviewer: TPAMI, TCI, TIP, TCVST, etc.
- Program Committee: SIGGRAPH Asia 2021 (Poster).

Patent

Three-Dimensional Object Scanning Device and Method, Pending.
AR-Display, Pending.
High Speed Communication with Wide Area Movable Receivers using Invisible Light, Pending.
3D Hand Scanner with Invisible Markers, Pending.
A Real-time Object Capture System,United States Patent 62048887, September 2014.
3-D Light Field Camera,United States Patent 61920074, December 2013.
An XSlit Camera for 3D Scene Reconstruction, United States Patent 61886161, October 2013.

Honors and Awards

Frank A. Pehrson Graduate Student Achievement Award, University of Delaware, 2015

Graduate Student Excellence Award, University of Delaware, 2014

Professional Development Award, University of Delaware, 2013, 2014

CVPR 2013 Travel Grant, the IEEE Computer Society PAMI Technical Committee, 2013

Honorable Graduation, Huazhong University of Science and Technology, 2009

Excellent Undergraduate Student Award, Huazhong University of Science and Technology, 2008

Technical Skills

- Programming Languages: Matlab, C/C++, Python.
- Operating Systems: Unix/Linux, Windows.
- Mobile Programming Platform: Android.