Runfeng Li

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Summary

I aim to develop a rigorous understanding from first principles of how sensing, physics, and self-supervised learning interact, and to build principled models that recover reliable physical structure for scientific, robotic, and medical imaging applications. I have experience in dynamic scene modeling, physics-based reconstruction, radiance fields, and time-of-flight imaging.

Education

Brown University Sep 2023 - May 2025
M.S. in Computer Science

University of Illinois Urbana-Champaign Jan 2021 - May 2023
B.S. in Mathematics and Computer Science

Columbia University (Visiting Student) Sep 2020 - Dec 2020
Fu Foundation School of Engineering and Applied Science

Tianjin University (Transferred Out) Sep 2018 - Jun 2020
Major in Electrical Engineering - Qiushi Elite Class

Research History

Research Assistant, Brown Visual Computing Lab Sep 2023 - Present
Advisor: Prof. James Tompkin
Collaborators: Prof. Matthew O'Toole (CMU), Dr. Christian Richardt (Meta)
Topic: Time of Flight Radiance Fields

Undergraduate Research Assistant, University of Illinois Urbana-Champaign Mar 2022 - Jan 2023
Advisor: Prof. Liangyan Gui
Topic: Human Motion Prediction and Generation

Publications

Time of the Flight of the Gaussians: Optimizing Depth Indirectly in Dynamic Radiance Fields
Runfeng Li, Mikhail Okunev, Zixuan Guo, Anh Ha Duong, Christian Richardt, Matthew O'Toole, James Tompkin. **CVPR, 2025 (Oral Presentation)**.

Monocular Dynamic Gaussian Splatting: Fast, Brittle, and Scene Complexity Rules
Yiqing Liang, Mikhail Okunev, Mikaela Angelina Uy, Runfeng Li, Leonidas J. Guibas, James Tompkin, Adam Harley. **TMLR, 2025**.

Talks

Time of the Flight of the Gaussians *CVPR*, 2025
New England Computer Vision (NECV) Workshop, 2024

Research Explorations and Implementations

Photorealistic Physics Simulation and Object Elasticity Reconstruction Mar 2024 - May 2024

- Estimated Young's modulus by backpropagating video-reconstruction gradients through our Taichi implementation of PhysGaussian

Raw 3D Gaussian Splatting for High Dynamic Range Reconstruction Oct 2023 - Dec 2023

- Explored raw-signal 3D Gaussian Splatting for HDR reconstruction using RawNeRF scenes

Research Explorations and Implementations (Continue)

Real-Time Gradient Domain High Dynamic Range Compression — Oct 2023 - Dec 2023

- Implemented single- and multi-grid Poisson PDE solvers in CUDA/C++ for real-time HDR tonemapping

Teaching Experience

Machine Learning Course Assistant — Aug 2022 - Dec 2022

UIUC CS 307 - a New Machine Learning Course:

- Designed coding assignments covering ML topics: SGD, SVM, Naive Bayes, MLP, GMM, and EM
- Assisted labs, held office hours, and contributed to exam question preparation

UIUC CS 446 - Graduate/Upper Undergraduate Machine and Deep Learning

- Graded homework and exams

Awards

Dean's List, University of Illinois Urbana-Champaign — 2021 - 2023

Future 30-Year Innovation and Entrepreneurship Competition — 2019

Team Leader, Second Prize (¥5,000 CNY) — *Tianjin, China*

- Defended an XR + brain–computer interface concept to reduce large-scale lighting and retail infrastructure energy use