

# Joel Julin

<https://joeljulin.github.io> jjulin@cmu.edu

## EDUCATION

### Carnegie Mellon University

*Ph.D. in Robotics (Advisor: László Jeni)*

*M.S. in Robotics (GPA: 4.19)*

Pittsburgh, PA, USA

Aug. 2025 – present

Aug. 2023 – Aug. 2025

*Thesis: Towards Geometric Reasoning for Dynamic and Unconstrained 3D Scenes*

### University of Pittsburgh

*B.S. in Computer Science*

Pittsburgh, PA, USA

Aug. 2019 – Dec. 2022

## RESEARCH EXPERIENCES

### Research Assistant

*Carnegie Mellon University, PA, USA*

Aug. 2023 - Now

- Collaborated with László Jeni to advance neural representations for 3D scenes.
- Resulted in DyLiN, the Dynamic Light Field Network method that can handle non-rigid deformations and outperform state-of-the-art methods. This paper was accepted to CVPR 2023.
- Resulted in CoGS, the Controllable Gaussian Splatting method, enabling real-time dynamic scene manipulation without the prerequisite of pre-computing control signals. This work was accepted to CVPR 2024.
- Created the first (at the time) dynamic 3D Gaussian Splatting viewer for VR.

### Research Intern

*Carnegie Mellon University, PA, USA*

May 2022 - Aug. 2023

- Interned with László Jeni through the Robotics Institute Summer Scholar (RISS) program.
- Researched automated content editing in NeRFs. This resulted in a publication to CMU's RISS 2022 Working Papers Journal.

### Research Intern

*Carnegie Mellon University, PA, USA*

May 2021 - May 2022

- Investigated the role of spatial mixing in a 2D Convolution with Simon Lucey in his Ci2CV Computer Vision Lab.
- We discovered that the role of spatial mixing is not all that important, and that by only learning the channel-mixing portion yields a number of improvements, such as faster training times and greater adversarial robustness.

## RESEARCH

- G. Cazenavette, J. Julin, S. Lucey. *Rethinking the Role of Spatial Mixing*. CVPR-W 2025
- L. Xie, J. Julin, K. Niinuma, L. Jeni. *Gaussian Splatting Lucas-Kanade*. ICLR 2025
- H. Yu, J. Julin, Z. Milacski, K. Niinuma, L. Jeni. *CoGS: Controllable Gaussian Splatting*. CVPR 2024
- H. Yu, J. Julin, Z. Milacski, K. Niinuma, L. Jeni. *DyLiN: Making Light Field Networks Dynamic*. CVPR 2023
- Y. Jang, et al. *VSCHH 2023: A Benchmark for the View Synthesis Challenge of Human Heads*. ICCV 2023
- J. Julin, H. Yu, L. Jeni. *Automated Content Editing in NeRFs*. RISS Working Paper Journal 2022

## U.S. PATENTS

- H. Yu, J. Julin, Z. Milacski, K. Niinuma, L. Jeni. *Anatomically Correct Neural Avatars*. pending

## AWARDS

- 8th China International “Internet +” Competition, one of 2 international projects selected from 3.4 M submissions across 111 countries, **Gold Medal**
- Funded by NSF from May 2022 to Aug. 2022.
- HackPSU Capital One Challenge. **1st Place**

## TECHNICAL SKILLS

**Programming Languages:** Python, C, Java, HTML

**Operating Systems:** Linux, MacOS, Windows

**Libraries and Tools:** PyTorch, Tensorflow, Sklearn, Pandas, Numpy, OpenCV

## RELEVANT COURSEWORK

Data Structures, Discrete Structures, Systems Software, Computer Vision, Operating Systems, Software Quality Assurance, Software Engineering, Computer Vision\*, Learning for 3D Vision\*, Math Fundamentals for Robotics\*, Visual Learning and Recognition\*, Learning-based Image Synthesis\*, Mobile Robots\*, Robot Learning\*

\* indicates graduate courses