Eric Ming Chen

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Ithaca, NY

Education

Cornell University Fall 2020 -
B.S. in Computer Science (Honors)
Advisors: Abe Davis and Noah Snavely
Research Interests: 3D Computer Vision, Computer Graphics, Geometric Machine Learning

Research Experience

Ray Conditioning for Multi-view Image Generation Summer 2022 - Spring 2023
Undergraduate Researcher with Prof. Abe Davis

- Introduced ray conditioning, a method for photo-realistic viewpoint control over generative image models.
- Demonstrated that it is possible to train a multi-view GAN without a 3D geometry-based model.
- Illustrated that ray conditioning can outperform geometry-based methods in image quality for view synthesis.

Topics: 3D content creation, view synthesis, light fields

What's in a Decade? Transforming Faces Through Time Summer 2021 - Summer 2022
Undergraduate Researcher with Prof. Hadar Averbuch-Elor and Prof. Noah Snavely

- Designed a framework to synthesize portrait photos across time, imagining how a person would look throughout 14 decades, and discovering trends in fashion and culture.
- Compiled a diverse dataset of 25,000+ historical people, along with detailed demographics and metadata.

Topics: Content creation, style transfer, visual discovery

Riemannian Residual Neural Networks Fall 2021 - Spring 2022
Undergraduate Researcher with Prof. Chris De Sa

- Introduced a general way to design ResNets on Riemannian manifolds.
- Constructed a Riemannian ResNet for hyperbolic space which outperforms previous work on link prediction and node classification for graphs.
- Demonstrated that our Riemannian ResNet for SPD matrices improves performance for time series classification.

Topics: Riemannian geometry, geometric deep learning, graph neural networks

Publications

1. Isay Katsman*, **Eric M. Chen***, Sidhanth Holalkere*, Anna Asch, Aaron Lou, Ser-Nam Lim, Chris De Sa, "Riemannian Residual Neural Networks," *NeurIPS 2023*
2. **Eric M. Chen**, Sidhanth Holalkere, Ruyu Yan, Kai Zhang, Abe Davis, "Ray Conditioning: Trading Photo-consistency for Photo-realism in Multi-view image Generation," *ICCV 2023*
3. **Eric M. Chen**, Jin Sun, Apoorv Khandelwal, Dani Lischinski, Noah Snavely, Hadar Averbuch-Elor, "What's in a Decade? Transforming Faces Through Time," *Computer Graphics Forum (Eurographics) 2023*

* Equal Contribution.

Leadership and Extracurriculars

Cornell University Artificial Intelligence (CUAI) Fall 2021 - Present
Co-President
Responsible for leading and mentoring a team of 16 undergraduate researchers. Fostering an environment for student-led research. Organizing a weekly reading group on recent papers for undergrads.

Cornell Data Journal Fall 2020 - Fall 2021
Member
Wrote an article about how geometry and combinatorics are used for efficient COVID testing in Rwanda. [Link]

Selected Coursework

CS 6630: Realistic Image Synthesis Spring 2022

- Built a path tracer with multiple importance sampling to render dielectrics and caustics.
- Created a volume renderer for hair and fur. Placed 2nd in the Cornell rendering competition. [Link]

CS 5643: Physically Based Animation for Computer Graphics Spring 2021

- Implemented a smoke animation simulator in Taichi. [Link]
- Investigated how to use divergence-free neural fields to model smoke animation as an optimal transport problem.

Other courses: Interactive Computer Graphics, Matrix Groups, Theoretical Linear Algebra and Calculus

TA Experience

- Introduction to Computer Graphics (Fall 22, Fall 23)
- Numerical Analysis: Linear and Nonlinear Problems (Spring 22, Spring 23)
- Computational Mathematics for Computer Science (Fall 21)
- Object Oriented Programming and Data Structures (Spring 21)

Grants and Honors

- Rawlings Cornell Presidential Research Scholar, 2020
- Dean's List, 2020-2023

Service

- Reviewer for CVPR 2024

Skills

Languages: Python, Julia, C++, Java, OCaml **Frameworks:** PyTorch, OpenCV, OpenGL, Taichi, Solidworks