

Daniel Lohn

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Education

University of California, Santa Barbara

- M.S. in Computer Science (ongoing, expected 12/2023)
- B.S. in Computer Science (graduated, 2023)
- College of Engineering Honors Program
- Relevant Coursework: Deep Learning, Computer Vision, Computer Graphics, Adv. Rt Rendering, Offline Rendering

Research Interests

- Computer Vision, Computer Graphics, Machine Learning.
- Virtual, Augmented, and Mixed Reality.
- Diffusion Models, generating both 2D and 3D content.
- 3D reconstruction, Multi-View Stereo, Monocular depth estimation.
- NeRF models, and editing content captured by NeRFs.

Projects

3DSTAR – 3D Style Transfer in AR

Mar 2023 – Jun 2023

- Integrated Meta AI's Segment Anything Model (SAM) with a Mobile AR interface to allow users to segment a real object and send video frames of the isolated object to a 3D reconstruction system to obtain a textured mesh.
- Applied Text-To-Image diffusion model Stable Diffusion to restyle NeRFs, Near-Surface Light Field models, and reconstructed 3D meshes according to a given text prompt. Awaiting publication as a poster at ACM UIST 2023.

Near-Surface Light Fields – Parametrizing a light field using an object's texture coordinates.

Sep 2022 – Mar 2023

- Wrote, trained, and finetuned models predicting opacity and RGB color on the surface on an object given a viewing direction and texture coordinates.
- Wrote Python scripts to process smartphone videos into standard data formats used for training NeRF-like models.

H2GO UCSB – Android app for locating and rating drinking water on the UCSB campus.

May 2022

- Used Android Studio, the Kotlin programming language, and an as-of-yet undecided database to create an Android application with both mapping and social media features.
- Assembled team of student developers and implemented multiple map images, Google Sign-On.

Plenoxels + CLIP – Optimizing a 3D voxel grid to resemble a text prompt

Jan 2021 – April 2021

- Translated a 3D voxel grid and volumetric rendering system from JAX to PyTorch. Added the ability to optimize the voxel grid to resemble image features generated from a text prompt using OpenAI's CLIP model.
- Experimented with different scene representations and loss functions to improve the quality of generated 3D models.

Publications

Daniel Lohn, Tobias Höllerer, Misha Sra. "Augmented Photogrammetry: 3D Object Scanning and Appearance Editing in Mobile Augmented Reality," In *Proceedings of the 36th Annual ACM Symposium on User Interface Software and Technology (UIST)*, 2023, to appear.

Pranav Acharya*, Daniel Lohn*, Vivian Ross*, Maya Ha, Alexander Rich, Ehsan Sayyad, and Tobias Höllerer. "Using Synthetic Data Generation to Probe Multi-View Stereo Networks," In *Proceedings of the International Conference on Computer Vision (ICCV)*, 2021, pp. 1583–1591.

Experience

AI Engineering Intern – Easel AI

Jul 2023 – Sep 2023

- Enhanced output quality of pretrained text-to-image diffusion models
- Expanded and maintained backend that interacts with cloud containers running various AI components.

Software Engineering Intern – Arista Networks, Santa Clara, CA

June 2022 – Sep 2022

- Built a benchmarking tool to monitor the query performance of a vital backend component of a web application for managing, monitoring, and automating deployments of network switches.
- Used Golang, Docker, Kubernetes, gRPC, and Git to add new functionality and tests to cloud applications.

Computer Vision Student Researcher – UC Santa Barbara

Sep 2020 – Aug 2021

- Developed a tool in the Unity game engine to load 3D indoor scene datasets and generate synthetic data for CV tasks.
- Used tool to generate RGB images, depth maps. Used data as input to five pre-trained 3D reconstruction networks.
- Wrote up how variation of the data impacts network performance, paper accepted to ILDAV workshop at ICCV 2021.