Jeffrey Hu

hujh14@gmail.com | linkedin.com/in/jeffrey-h-hu | github.com/jefequien

Education

Massachusetts Institute of Technology **Cambridge, MA**

Master of Science in Computer Science and Engineering, 2019 *GPA: 4.7/5.0*

Bachelor of Science in Computer Science and Engineering, 2018

Experience

gsplat **Apr 2024 - Present**

Open-source Contributor San Diego, CA

- Made several popular contributions to gsplat, a leading Gaussian Splatting implementation for 3D reconstruction and novel view synthesis with over 2k stars. These include:
  - 3DGS-MCMC (link) for an improved densification strategy.
  - Bilateral Guided Gaussian Splatting (link) for handing exposure changes.
  - Fisheye camera support (link).
  - Combined MCMC, Self-Organizing Gaussian Splats, and spherical harmonics k-means clustering for a new SOTA in Gaussian splat compression (link).
  - Implemented 2.5DGS (link) for surface reconstruction.

Parallel Systems **Mar 2022 - Apr 2024**

Senior Software Engineer, Perception Los Angeles, CA

- Led the development of a real-time multitask computer vision network and data engine for an autonomous train perception system.
- Built a multitask network for 3D object detection, 3D track prediction, depth prediction, and BEV segmentation iteratively.
  - Wrote a Pytorch library for training models with various backbones, task-specific heads, and loss functions.
  - Developed a novel representation for railroad track geometry prediction by regressing 3D splines and classifying switch states.
  - Shipped multiple model iterations onto a Jetson using Rust, TensorRT, and DeepStream.
- Developed a 3D reconstruction and autolabeling pipeline for scalable ground truth generation using Dagster and Kubernetes.
  - Leveraged zero-shot open-vocabulary foundation models for 2D computer vision tasks like object detection, segmentation, tracking, monocular depth estimation, etc.
  - Aggregated predictions across time to reconstruct 3D representations of each scene as high-quality labels for training and evaluating the real-time network.
  - Built infrastructure to carefully balance datasets, mine for scenarios, and automatically generated test reports to prove the regulatory safety case over time.
- Contributed to sensor calibration, onboard data collection, triggering, and upload infrastructure.

TuSimple **Jan 2020 - Mar 2022**

Research Engineer II San Diego, CA

- Developed a novel method for correcting camera drift in visual odometry by training a network to regress the difference between the current image and a rendered synthetic map view.
- Wrote an onboard C++ library to efficiently manage 6DoF transformation matrices between coordinate frames of a scene graph in an asynchronous system.

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MIT Computer Vision Group **Sep 2017 - Jan 2020**
Research Assistant Cambridge, MA

- Investigated scalable semi-automatic methods for labeling large segmentation datasets.
- Built a browser-based annotation tool for rapid segmentation editing.

Amazon Prime Air **June 2016 - Aug 2016**
Software Engineer Intern Seattle, WA

MIT Varsity Squash **Sep 2014 – June 2018**
Captain Cambridge, MA

Skills

Programming: Python, Pytorch, C++, Rust, CUDA, Git
Hobbies: squash, cycling, skiing, hiking