Kaiyuan Wang

k5wang@ucsd.edu
UC San Diego, La Jolla, CA

github | linkedin
twitter | site

Summary

I'm a computer science Master's student at UC San Diego with a specialized focus in computer vision and robotics, applying for PhD positions starting Fall 2024. My ongoing and past projects span topics including deformable tissue tracking, 6 DoF pose estimation, semantic segmentation, GANs, and advanced rendering techniques.

Education

M.S in Computer Science, UC San Diego. GPA: 3.96/4.0 *2022-2024*

Coursework: Convex optimization, Deep learning (3D data, generative model, vision), Unsupervised learning.

B.S. in Computer Engineering, UC San Diego. GPA: 3.75/4.0 *2018-2022*

Coursework (advanced): Deep learning, OS, Computer Networks, Signal processing.
Coursework (fundamental): Algorithms and data structures, Linear algebra, Probability, Calculus.

Research

A Robust Long-term Deformation Tracking Framework for Endoscopic Videos *Summer 2023*
Lead Author | UC San Diego, ARC Lab

- Improved deformable tissue reconstruction in an existing surgical perception framework by implementing:
  - Deformable point set registration using Gaussian Mixture Model.
  - Keyframe-based loop closure.

*Pending RA-L submission.

Differentiable Neural Architecture Search for Blood Cell Image Classification *Summer 2021*
Independent Study | UC San Diego, Professor Pengtao Xie's Group

- Conducted survey on differentiable neural architecture search (DARTS) methods.
- Increased GPU utilization from 20% to 80% by migrating data pipeline to ephemeral SSD on kubectl cluster.

Projects

Point cloud registration using convex-relaxation on $\mathbb{SE}(3)$ *Winter 2022*

- Reproduced paper *Convex Relaxations of $SE(3)$* using a python-based convex problem solver.
- Compared the convex-relaxation method with SVD-based iterative closest-point. (report)

Generative Model for 2D Images *Winter 2022*

- Surveyed generative methods and text-to-image methods.
- Implemented and experimented with VAE (code) and convolutional GAN (code).

Ray-tracing Renderer *Winter 2022*

- Implemented ray-tracer renderer with acceleration structure in C++
- Implemented vertex shader using OpenGL framework.

Learning-based 6D object pose estimation *Fall 2022*

- Implemented point cloud segmentation and keypoint prediction using PointNet
- Implemented iterative closest point algorithm for pose prediction (code)

Teaching Assistanship

Teaching assistant: CSE120 Operating Systems *Fall 2022, Spring 2023, Fall 2023*

- Automated grading and GitHub course repo management for 300+ students.
- Led discussion sections and prepared original instruction materials.
- Designed and graded exam questions.

Tutor: CSE120 Operating Systems *Winter 2021, Spring 2022*

- Helped students with debugging and conceptual questions

Skills and Extra

Programming Languages: ***Experienced:*** Python, Java | ***Familiar:*** C++, Bash, Go

Frameworks & Libraries: Pytorch, Jupyter, Open3D, Matplotlib, Numpy, Scikit-learn, Tensorflow, Kubernetes

Languages: English (fluent), Mandarin (native)

Extra: I enjoy taking and sharing my notes. They are posted here.
I'm also a basketball player. Here is a GIF of me playing :)