Kaiyuan Wang

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github | linkedin
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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 :)