Xiaodi "Ada" Yuan

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EDUCATION

University of California San Diego   Sep 2023 - Present
Ph.D. in Computer Science

- Advised by Prof. Hao Su

Tsinghua University   Sep 2019 - Jun 2023
B.Eng. in Computer Science

- Yao Class, Institute for Interdisciplinary Information Sciences (IIIS)
- GPA: 3.97/4.00, rank 3/32

EMPLOYMENT

Hillbot, Research Intern   Jun 2024 - Sep 2024

RESEARCH EXPERIENCE

Algorithmic Acceleration of Affine Body Dynamics   Jul 2024 - Present
Mentor: Hao Su, Yin Yang

Real-Time Simulation for Soft-Body Manipulation   Mar 2024 - Jun 2024
Mentor: Hao Su, Yin Yang

- Implemented real-time simulation environments of cloth and ropes (elastic rods) on the GPU, based on Projective Dynamics and Position Based Dynamics.

Mesh Processing and Optimization   Dec 2023 - May 2024
Mentor: Hao Su

- Applied IPC-style optimization in mesh processing, aiming to generate low-poly, manifold, watertight, and self-intersection-free meshes from triangle-soup inputs. Paper in submission.

IPC Simulation for Soft-Body Manipulation   Oct 2022 - Feb 2024
Mentor: Hao Su, Yin Yang, Tao Du

- Implemented a GPU-accelerated IPC (Incremental Potential Contact) simulator using the NVIDIA Warp library. It supports deformable objects using FEM (Finite Element Method) and rigid objects using ABD (Affine Body Dynamics).
- It served as the simulator for the ManiSkill-ViTac Challenge 2024 (presented at the ViTac workshop in ICRA 2024). The realistic tactile sensor simulation helped transfer policies trained in simulation to real-world robots.

Physical Simulation Projects   Mar 2022 - Aug 2022
Mentor: Hao Su

- **MPM and System Identification**: Implemented a differentiable MPM (Material Point Method) framework with PyTorch. A neural network can be plugged into the framework and optimized using differentiable simulation to estimate the physical properties of objects.
- **SPH and ManiSkill2**: Participated in the ManiSkill2 project, a robotic manipulation benchmark that supports rigid and soft-body tasks. Implemented the SPH (Smoothed-Particle Hydrodynamics) algorithm for the simulation environment of a soft-body manipulation task.

Parametric CAD Scan Completion   Aug 2021 - Feb 2022
Mentor: Li Yi

- Developed a generalizable point cloud completion method for CAD models by deducing the parametric modeling process from the partial observations.

PUBLICATIONS

- Weihang Chen, Jing Xu, Fanbo Xiang, **Xiaodi Yuan**, Hao Su, Rui Chen. "General-Purpose Sim2Real Protocol for Learning Contact-Rich Manipulation With Marker-Based Visuotactile Sensors". *IEEE Transactions on Robotics (TRO), 2024.*

- Jiayuan Gu, Fanbo Xiang, Xuanlin Li, Zhan Ling, Xiqiang Liu, Tongzhou Mu, Yihe Tang, Stone Tao, Xinyue Wei, Yunchao Yao, **Xiaodi Yuan**, Pengwei Xie, Zhiao Huang, Rui Chen, Hao Su. "ManiSkill2: A Unified Benchmark for Generalizable Manipulation Skills." *International Conference on Learning Representations (ICLR), 2023.*

LANGUAGE SKILLS

- **TOEFL**: 109 (Reading 30, Listening 29, Speaking 24, Writing 26)
- **GRE**: 329 + 4.0 (Verbal 159, Quantitative 170, Writing 4.0)

HONORS AND AWARDS

- **The National Scholarship** — 2019 - 2020
- **Outstanding Student Leader** | Institute for Interdisciplinary Information Sciences, THU — 2021
- **National Olympiad in Informatics (NOI), Silver Medal** — 2018