

# Siyu Ma

Last update on March 11, 2025

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## Education

University of California, San Diego	SAN DIEGO, USA
<b>M.S. in Computer Science</b>	2023 – 2024
University of Electronic Science and Technology of China	CHENGDU, CHINA
<b>B.Eng. in Software Engineering</b> , Digital Animation	2019 – 2023
<b>Honors and Awards:</b> Honor Graduate; Outstanding Undergraduate Scholarship (2020-2023)	

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## Publications

### **GRIP: A General Robotic Incremental Potential Contact Simulation Dataset for Unified Deformable-Rigid Coupled Grasping**

Siyu Ma\*, Wenxin Du\*, Chang Yu\*, Ying Jiang\* (\* joint first authors), Zeshun Zong, Tianyi Xie, Yunuo Chen, Yin Yang, Xuchen Han, Chenfanfu Jiang. ArXiv, 2025. (*in IROS 25' submission*).

### **Embedded IPC: Fast and Intersection-free Simulation in Reduced Subspace for Robot Manipulation**

Wenxin Du\*, Chang Yu\* (\* joint first authors), Siyu Ma, Ying Jiang, Zeshun Zong, Yin Yang, Joe Masterjohn, Alejandro Castro, Xuchen Han, Chenfanfu Jiang. ArXiv, 2024. (*ICRA 25'*).

### **Singing Mouth Shape and Face Animation Generation Method and Device and Electronic Equipment**

Xueyuan Yin, Qinyin Xiao; Xinzhong Liu, Hongyu Chen, Siyu Ma. Chinese Patent, CN114972592A.

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## Experience

Artificial Intelligence & Visual Computing Lab at UCLA	LOS ANGELES, USA
<b>Research Assistant</b> , Advisor: Chenfanfu Jiang	Jan '24 – Present

**IPC Simulation Engine for Robotics development.** Currently involved in the development of the IPC simulator engine for robotics tasks.

**GRIP Dataset** Developed a fully automated generative pipeline for grasp synthesis, enabling large-scale soft-rigid grasping data generation with physically realistic simulations. Created a General Robotic Incremental Potential (GRIP) Contact Simulation Dataset (100K grasps, 1,200 objects) to enhance generalizable grasp prediction models, validated through neural grasp generation and stress field prediction.

**Embedded IPC.** Devised an efficient subspace representation that simplifies the computation by focusing on an embedded coordinate, effectively decoupling the simulation's complexity from the input model's resolution without sacrificing simulation quality. Responsible for the setup of baseline experiments, utilizing MuJoCo, Isaac Gym/Sim to run a series of FinRay gripper grasping demos.

**Foley ControlNet.** Developed a video-to-audio Diffusion generation model to enable precise control over loudness, timbre, and rhythm for the generated Foley. Built on the Diff-Foley pre-trained foundation model and leveraged ControlNet to encode features such as loudness extracted from an additional audio as control signals, enhancing fine-grained controllability for Foley generations.

XiaoHi Studio, Dragonest Co.,Ltd	CHENGDU, CHINA
<b>Machine Learning Algorithm Intern</b>	Mar '21 – Jul '23

**Research and development of a data-driven model for facial animation driven by singing.** Developed and trained a DNN-based model to generate facial animation synchronized to a singing voice. Submitted a patent.

**Phoneme-driven Live2D model mouse shape animation generation.** Developed a tool to identify phonemes in the input texts and map them to corresponding model mouth shapes.

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## Selected Projects

**AyaRay Renderer** Designed and developed an offline CPU Monte-Carlo path-tracing renderer in modern C++. Included many algorithms in light transportation and appearance modeling, such as Bidirectional Path Tracing and Photon Mapping. Used BVH to accelerate the detection of ray intersections with objects. Won Second Prize in the Chinese National Undergraduate Computer Design Competition.

**Position-based Fluid** An OpenGL implementation of 3D fluid simulation based on Position-based Dynamics.

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## Skills

**Technical expertise:** C/C++ (OpenGL), Python (PyTorch, DDP, Warp), AWS, Git, LaTeX, SSH, CMake, Houdini, MeshLab, MuJoCo, Isaac Gym/Sim, Omniverse.