

Siyu Ma

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Education

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

Publications

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. (*in ICRA 2025 submission*).

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.

Experience

Artificial Intelligence & Visual Computing Lab at UCLA	LOS ANGELES, USA
Research Assistant , 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.	
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
Machine Learning Algorithm Intern	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.	

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.

Skills

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