Mia Tang

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Research Interests

Computer graphics; generative vision-language models;
controllable 2D and 3D generation; sketch-based generation;

Education

Stanford University, Stanford, CA 2023 ~
Master of Science, Computer Science
Advisor: Maneesh Agrawala

Carnegie Mellon University, Pittsburgh, PA 2018 ~ 2023
Bachelor of Computer Science and Arts
Advisor: Jun-Yan Zhu

Academic Publications

Conference Papers

[p.3] Michelle Guo*, **Mia Tang***, Hannah Cha, Ruohan Zhang, C. Karen Liu, Jiajun Wu. 2024. ShapeCraft: Body-Aware and Semantics-Aware 3D Object Design. IEEE/CVF Winter Conference on Applications of Computer Vision. (WACV '25).

[p.2] Vishnu Sarukkai, Sylvia Yuan*, **Mia Tang***, Maneesh Agrawala, Kayvon Fatahalian. 2024. Block and Detail: Scaffolding Sketch-to-Image Generation. ACM Symposium on User Interface Software and Technology (UIST '24).

[p.1] Daohan Lu*, Sheng-Yu Wang*, Nupur Kumari*, Rohan Agarwal*, **Mia Tang**, David Bau, Jun-Yan Zhu. 2023. Content-Based Search for Deep Generative Models. ACM Transactions on Graphics (SIGGRAPH Asia '23).

Organized Workshops

[ow.5] Anyi Rao, Yuanbo Xiangli, Yuwei Guo, **Mia Tang**, Chenlin Meng, Maneesh Agrawala. 2024. Generative Models for Visual Content Editing and Creation. ACM Transactions on Graphics – Workshop (SIGGRAPH Workshop '24).

[ow.4] Rajesh Sharma, **Mia Tang**. 2024. Introduction to Generative Machine Learning. ACM Transactions on Graphics – Workshop (SIGGRAPH Workshop '24).

[ow.3] Anyi Rao, Aleksander Holynski, Jon Barron, Fabian Caba, Ruihang Zhang, **Mia Tang**, Yuwei Guo, Victor Escorcia, Linning Xu, Jean-Peic Chou, Elia Peruzzo, Yu Xiong, Ali Thabet, Dong Liu, Dahua Lin, Bernard Ghanem, Angjoo Kanazawa, Alexei A. Efros, Maneesh

Agrawala. The Future of Generative Visual Art. The IEEE / CVF Computer Vision and Pattern Recognition Conference – Workshop (CVPR Workshop '24).

[ow.2] Rajesh Sharma, **Mia Tang**. 2023. Introduction to Generative Machine Learning. ACM Transactions on Graphics – Workshop (SIGGRAPH Asia Workshop '23).

[ow.1] Rajesh Sharma, **Mia Tang**. 2023. Introduction to Generative Machine Learning. ACM Transactions on Graphics – Workshop (SIGGRAPH Workshop '23).

Research Experience

2023 ~ Present **Stanford University**, Stanford, CA
Faculty supervisor: Maneesh Agrawala

- Leading an ongoing project exploring generative models for creative applications, with a focus on expanding the controllability and capabilities of AI-assisted art and design tools. Collaborating with PhD student Yael Vinker from Tel-Aviv University.
- Conducted research on a sketch-to-image algorithm that aligns with the iterative refinement process of artists, allowing users to generate high-fidelity images through a combination of coarse blocking strokes and refined detail strokes [p.2].

2023 ~ 2024 **Stanford University,** Stanford, CA
Stanford Vision and Learning Lab (SVL)
Faculty supervisors: Jiajun Wu & Karen Liu

- Collaborated with PhD student Michelle Guo on a project that synthesizes body-aware 3D objects from text, image, or sketch inputs. The generated 3D meshes can be simulated on virtual characters or fabricated for real-world use [p.3].
- Developed a mesh deformation algorithm optimized for semantic alignment and minimizing contact and penetration losses, enabling 3D objects that are ready for direct fabrication and wearable in real-world scenarios.
- Engineered an end-to-end system with multiple stages of geometry processing, optimization, and refinement using techniques such as Jacobian deformation.

2022 ~ 2023 **Carnegie Mellon University**, Pittsburgh, PA
Faculty supervisor: Jun-Yan Zhu

- Worked on a learning-based generative model search algorithm that lets users find image generative models with inputs of four modalities: text, images, sketches, and existing models [p.1].
- Created the Generative Model Zoo, a synthetic dataset comprising over 2,000 diffusion models fine-tuned through various methods, establishing a new benchmark for generative model retrieval tasks.
- Designed and implemented a real-time web application that allows users to search, upload, and browse pre-trained generative models, leading the design, development, and testing of both the user interface and backend algorithm.

2021~ 2022 **Carnegie Mellon University**, Pittsburgh, PA
Faculty supervisor: Kyuha Shim

- Designed and developed data visualization web experiences in collaboration with the United States Census Bureau, presenting insights on food insecurity across the US.
- Created a participatory platform that allows users to explore existing data-driven

visualizations and contribute their own stories. Led a team of five developers and designers through the complete process from ideation to deployment.

2021/2 ~ 5 **Carnegie Mellon University**, Pittsburgh, PA
Faculty supervisor: Joshua Sunshine

- Initiated and developed online documentation for Penrose, a system that converts plain text into mathematical diagrams, providing step-by-step tutorials to guide users.
- Designed illustrative diagrams to explain complex mathematical concepts, such as linear algebra, enhancing the accessibility and usability of the system.

2020 ~ 2021 **Carnegie Mellon University,** Pittsburgh, PA
CMU Robotics Institute Project – Iris Lunar Rover

- Contributed to the development of America's first student-built, and the world's smallest and lightest, lunar rover by implementing the native interface using Vue.js, enabling ground control officers to manage and operate the rover remotely.

Industry Experience

2023/5 ~ 12 **Adobe Research**, San Jose, CA
Research Engineer Intern @ RED (Research Engineering, and Design Team)

2022/6 ~ 8 **Cesium**, Philadelphia, PA
Software Developer Intern

2021/5 ~ 8 **Jam3**, Toronto, Canada
Developer Intern

University Teaching

Winter 2023 **Course Assistant, CS 248A: Computer Graphics: Rendering, Geometry, and Image Manipulation, Stanford University**, Stanford, CA

Fall 2023 **Course Assistant, CS 147: Introduction to Computer Graphics and Imaging**
Stanford University, Stanford, CA

Spring & Fall 2022 **Teaching Assistant, 15-462/662: Computer Graphics**
Carnegie Mellon University, Pittsburgh, PA

Spring & Summer 2020 **Teaching Assistant, 15-150: Principles of Functional Programming**
Carnegie Mellon University, Pittsburgh, PA

Youth Education & Outreach

2024 **St. Elizabeth Ann Seton School,** Palo Alto, CA
Preschool Math Tutor

- Taught basic mathematical concepts, such as counting, comparing, and one-to-one correspondence, to preschool students (under 5 years old) using teaching props..

2017 ~ 2018 **PALS Autism School,** Vancouver, B.C., Canada
Classroom Assistant Volunteer

- Assisted teachers in preparing classroom materials and activities to support the learning and development of students on the autism spectrum.

Art Exhibition

2017/8 **Moneterre Financial Cup Canadian Youth Visual Art Competition,** Vancouver, Canada
Received *Best Painting Award* & *The Golden PaintBrush Award*.

2017/6 **Group exhibition at Life of Art Young Artist Exhibition**, Vancouver, Canada
Presented my three oil on canvas paintings at the exhibition.

Other Experience

2022 ~ Present **Personal Blog & Social Media Platforms**
Educational Content Creator & Illustrator

- Conceptualized, designed, and distributed 60+ illustrations on complex technology concepts such as diffusion model, autoencoder, GANs, and fundamental Computer Graphics concepts such as Ray Tracing and Bounding Volume Hierarchy, with the aim to share knowledge in simple and creative approaches.
- Engaged with over 1 million people, with a single Tweet on Anti-Aliasing reaching 800K+ unique impressions and 100K+ engagements. Multiple artworks have been featured in tech community blogs and used as teaching materials at institutions such as Carnegie Mellon University, Oakland University and Delft University of Technology.
- Developed illustrative teaching materials for conference courses [ow. 1-5] at top academic venues like SIGGRAPH and CVPR, including the repeatedly offered SIGGRAPH course on introductions to generative machine learning [ow.1, ow.2, ow.4] , which consistently attracts over 600 attendees each time.

2021 ~ 2022 **Lunar Gala**, Pittsburgh, PA
Head of Web

- Led the web design & dev team of 10, shaped the technical roadmap and provided guidance on technical decisions. Lunar Gala is an annual student-run fashion show.
- Maintained and developed new features such as Landing and Lines pages to help create an informative platform for potential fashion show attendees to attain key information, e.g., fashion lines, ticketing, and livestream access.