Xuyi MENG

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University of Pennsylvania, Philadelphia, U.S.

EDUCATION

University of Pennsylvania (UPenn) Aug 2023 – May 2025 (Expected)
M.S. in Computer and Information Science *Philadephia, U.S.*

Nanyang Technological University (NTU) Aug 2019 – May 2023
B.E. in Computer Science (***Highest Honor Distinction***) *Singapore*

Relevant Modules: *(undergrad)* Linear Algebra (A+), Probability and Statistics (A+), Discrete Math (A+), Advanced Algorithms (A+), Algorithms (A+), Data Structures (A+), Operating Systems (A), Advanced Computer Architecture (A+), Data Science and Artificial Intelligence (A), Neural Network & Deeplearning (A), Computer Vision (A); *(graduate)* Adcanced Algorithms (A), Deep Learning (A+), Computer Vision (A+), Machine Perception (A+)

RESEARCH INTERESTS

3D generation/reconstruction, video generation, robotics perception, embodied AI, neural scene representation, point cloud, computer graphics; algorithms.

PUBLICATIONS

Zero-1-to-G: Direct 3D Generation using 2D Diffusion
ICLR 2025 submission (project page)
***Xuyi Meng**, Chen Wang, Jiahui Lei, Kostas Daniilidis, Jiatao Gu, Lingjie Liu*

LN3Diff: Scalable Latent Neural Fields Diffusion for Speedy 3D Generation
ECCV 2024 accepted (project page)
*Yushi Lan, Fangzhou Hong, Shuai Yang, Shangchen Zhou, **Xuyi Meng**, Bo Dai, Xingang Pan, Chen Change Loy*

Self-Supervised Geometry-Aware Encoder for Style-Based 3D GAN Inversion
CVPR 2023 accepted (project page)
*Yushi Lan, **Xuyi Meng**, Shuai Yang, Chen Change Loy, Bo Dai*

SPNR: Generalizable Sparse-Point Neural Rendering
CVPR 2023 submission
***Xuyi Meng**, Jialin Zhang, Fanbo Xiang, Jiayuan Gu, Xiaoshuai Zhang, Hao Su*

RESEARCH EXPERIENCE

GRASP Lab @ UPenn Aug 2023 – Present
Graduate Research Assistant *Philadelphia*
Advisor: **Prof. Lingjie Liu** and **Prof. Kostas Daniilidis**

- ***Zero-1-to-G***: a novel approach for direct image-to-3D generation leveraging pretrained 2D diffusion priors; achieved SOTA on the GSO benchmark and strong generalization to in-the-wild data, in both texture quality and geometry consistency. Submitted to ICLR 2025.
- ***Efficient Generation of Gaussian Splats***: integrated 3D Gassian Splatting into the GAN framework, significantly improved the training speed of 3D GAN.

- ***Open-Cat3D***: reproduced 3D generative model Cat3D and opened the source for community usage as vision fondation model in 3D generation and reconstruction.

MMLab @ NTU — Final Year Project Jan 2023 – May 2023
Final Year Project *Singapore*
Advisor: **Prof. Ziwei Liu** and **Prof. Chen Change Loy**

- ***Mobile Human***: a light-weight model to reconstruct human avatars from monocular videos, achieved rendering speeds of up to 108 FPS for real-time applications, deployed on mobile devices (phone, ipad, laptop) with memory-efficient and computation-efficient rendering techniques. Got A+ in oral defense and overall evaluation.

MMLab @ NTU — URECA Mar 2022 – May 2023
Undergraduate Research Experience on Campus (URECA) *Singapore*
Advisor: **Prof. Chen Change Loy** and **Prof. Bo Dai**

- ***LN3Diff***: a generic image/text-to-3D generative model, employed 3D-aware architecture and variational autoencoder (VAE) to encode input images into a structured and compact 3D latent space, enabled fast generation of high-quality 3D object mesh within 8 V100-SECONDS. Accepted to ECCV 2024.
- ***E3DGE***: an encoder-based 3D GAN inversion framework for high-quality 3D shape and texture reconstruction, proposed global-local two-branch structure for global consistency and local detail enhancement, enabled shape and style editing on the generation results. Accepted to CVPR 2023.

Su Lab @ UC San Diego June 2022 – Nov 2022
Summar Intern *La Jolla*
Advisor: **Prof. Hao Su**

- ***SPNR***: a conditional water-tight textured mesh generative model from sparse points input, disentangled the generation on geometry and texture using separate branches, achieved high-quality generation results on ABO and ShapeNet datasets. Submitted to CVPR 2023.

OTHER RESEARCH PROJECTS

Real-time Face Swapping & Sticker Decorations Nov 2023 – Dec 2023
Advisor: **Prof. Jianbo Shi** *Philadelphia*

- Developed a real-time face swapping model from Generative Adversarial Network (GAN) to achieve high-fidelity and fast face swapping in streaming video.
- Implemented trigger-based sticker decorations when certain facial expressions are detected.
- Deployed the whole pipeline on Google Colab to process webcam video streaming in real-time.
- Won the ***Best Project Prize (top1)*** in the final evaluation among 30+ teams.

Robotic Arm for Remote Control in Bio-Chemistry Lab May 2021 – Sep 2021

- Designed a prototype robotic arm that can be remotely controlled to perform elementary operations in the biology and chemistry labs, such as adding solvents to the given amount, heating, water bath, shaking and moving test tubes.
- Implemented a user-friendly graphic interface and used Wi-Fi to send control signals.

Algorithm Innovation: Find Top-K Nearest Hospitals Oct 2020 – Nov 2020

- Proposed a multiple-marking mechanism to return an input number of nearest hospitals for each location in a city represented by a directional unweighted graph, significantly reduced time. complexity from $O(N^N)$ of the original searching algorithm to $O(N + E)$ as well as saved space complexity.
- Introduced an idea of object-oriented node representation to the graph to store necessary information.

WORK EXPERIENCE

Visual Intelligence Scientist Intern May 2021 – Dec 2021
*Agency for Science, Technology and Research (A*STAR), Institute for Infocomm Research (I2R), Singapore*

- Simplified 3D point cloud instance segmentation from the current two-stage methods to one-stage, further integrated with semantic segmentation using the same pipeline.
- Replaced traditional point aggregation on euclidean distance, introduced implicit 3D instance embedding learned from attention mechanism.
- Achieved comparable 3DIoU scores with the state-of-the-art methods on ScanNet-v2 benchmark using minor computational cost.

TEACHING EXPERIENCE

CIS 7000 Neural Rendering Fall 2024
Head Teaching Assistant *Unversity of Pennsylvania*

EXTRACURRICULAR ACTIVITIES

NTU Chinese Orchestra 2019 – 2023

- Held special concert "Winter to Spring" at Sigapore SOTA hall in memory of the covid era.
- Served as the Publication and Publicity committee to organize concerts and events.
- Participated in international competitions and awarded Gold with Distinction, first prizes.
- Performed at annual concerts and other events.

NTU Chinese Dance Club 2019 – 2023

- Performed at annual concerts each year.

SCHOLARSHIP & HONORS

Bachelor of Engineering with Honors (Highest Honor Distinction) Jul 2023
NTU President Research Scholar 2020 – 2023
NTU Science and Engineering Scholarship 2019 – 2023

LANGUAGE SKILLS

Languages: Chinese (Native), English (Fluent), French, Japanese (Basic), Malay, Indian (Intro)
Programming languages and frameworks: PyTorch, Python, CUDA, C, C++, SQL, Java, JavaScript, Arduino, React-JS, Prolog, LaTex