Yifeng Xiong

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EDUCATION

University of California, Irvine **Irvine, CA**
Bachelor of Science in Computer Science Sep 2019 – Jun 2024
Bachelor of Science in Mathematics

- **Cumulative GPA: 3.944/4.00**
- **Rewards:**
  ICS Honor, Dean's Honor List, Phi Beta Kappa, Pi Mu Epsilon, UROP 2022 Research Experience Fellowship
- **Courses:**
  Computer Science: Machine Learning, Deep Learning, Artificial Intelligence, Computer Vision, Graphical Models, Algorithms, Computer Architecture, Human Computer Interaction, Data Management, Applied Cryptography
  Mathematics: Multivariable Calculus, Probability Theory, Stochastic Processes, Elementary Analysis, Complex Analysis, Linear Algebra, Number Theory, Abstract Algebra

PUBLICATIONS / PREPRINTS

[1] **Yifeng Xiong**, Haoyu Ma, Shanlin Sun, Kun Han, Hao Tang, and Xiaohui Xie. "Light Field Diffusion for Single-View Novel View Synthesis." *arXiv preprint arXiv*:2309.11525

[2] Kun Han, **Yifeng Xiong**, Chenyu You, Pooya Khosravi, Shanlin Sun, Xiangyi Yan, James Duncan, and Xiaohui Xie. "MedGen3D: A Deep Generative Framework for Paired 3D Image and Mask Generation." In *Medical Image Computing and Computer-Assisted Intervention–MICCAI 2023*

[3] Che Yu Lee*, Dylan Riffle*, **Yifeng Xiong***, Nadia Momtaz, Yutong Lei, Joseph M. Pariser, Diptanshu Sikdar, Ahyeon Hwang, Ziheng Duan, and Jing Zhang. "Characterizing dysregulations via cell-cell communications in Alzheimer's brains using single-cell transcriptomes." *BMC Neuroscience 2024*

RESEARCH EXPERIENCE

Generative Models and 3D Vision **University of California, Irvine**
Undergraduate Researcher in Professor Xiaohui Xie's Lab Jul 2022 – Present

Project title: Light Field Diffusion (Paper [1])

- Proposed a new diffusion-based approach for single-view novel view synthesis task.
- Transformed the camera rotation and translation into light field encoding to provide local pixel-wise constraints.
- Train a conditional diffusion model with light field encoding on ShapeNet Car, achieve competitive results with other diffusion-based approaches with fewer parameters.
- Finetune a pre-trained latent diffusion model on Objaverse to demonstrate the method can synthesize high quality results. The model also showcases the ability for zero-shot generalization.

Project title: MedGen3D (Paper [2])

- Proposed a deep generative framework to generate paired 3D medical images and masks.
- Represented 3D medical data as 2D sequences and proposed the Multi-Condition Diffusion Probabilistic Model to generate multi-label mask sequences adhering to anatomical geometry.
- Used an image sequence generator and semantic diffusion refiner to produce realistic 3D medical images conditioned on the generated mask sequences.
- Demonstrated the benefits of our generated results for segmentation task on 3D thoracic CT and brain MRI datasets: pretrained the model with synthesized data and finetuned with real data outperforms the model with only real data in Sørensen–Dice coefficient metric.

Cell-to-Cell Communication Analysis **University of California, Irvine**
Undergraduate Researcher in Professor Jing Zhang's Lab Jan 2022 – Jun 2023

Project title: UROP: CellChat and NicheNet in Alzheimer's disease (AD) (Paper [3])

- Investigated dysregulated ligand-receptor gene pairs in the disease at the cell-type resolution to explore cell-to-cell communication in healthy brains and their perturbations in AD.
- Processed the single-nucleus RNA sequencing (snRNA-seq) data in human prefrontal cortex from the raw fastq files by R.
- Modified the source code of CellChat and NicheNet for better visualization.
- Built a high-confidence cell-to-cell communication network via CellChat and connected it with downstream risk genes via NicheNet.

TEACHING EXPERIENCE

Reader	**ICS 6D**	**Discrete Mathematics for Computer Science**	Spring 2022, Winter 2023, Spring 2023
Reader	**ICS 6B**	**Boolean Logic and Discrete Structures**	Fall 2022
Learning Assistant	**ICS 6D**	**Discrete Mathematics for Computer Science**	Winter 2022

SKILLS

Language: Mandarin (Native); English (Fluent)
Skills: Python, C++, SQL, R, Java, MATLAB, Mathematica