

Yifeng Xiong

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EDUCATION

University of California, Irvine

Bachelor of Science in Computer Science

Bachelor of Science in Mathematics

- **Cumulative GPA: 3.938/4.00**

- **Rewards:**

ICS Honor, Dean's Honor List, 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

Mathematics: Multivariable Calculus, Probability Theory, Stochastic Processes, Elementary Analysis, Linear Algebra, Number Theory, Abstract Algebra

Irvine, CA

Sep 2019 – Jun 2024

PUBLICATIONS / PREPRINTS

[1] **Yifeng Xiong**, Haoyu Ma, Shanlin Sun, Kun Han, 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, Ahyeon Hwang, Ziheng Duan, and Jing Zhang. "Characterizing dysregulations via cell-cell communications in Alzheimer's brains using single-cell transcriptomes." *bioRxiv* 2023.07.16.548274

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.
- Used cross-attention layers to model the relationship between reference and target.
- Demonstrated that the proposed method can generate images with higher quality than NeRF-based approaches and can obtain sample quality similar to other diffusion-based approaches but with only 1/3 model size on ShapeNet Car and Neural 3D Mesh Renderer datasets.

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