JIAXIN LU

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University of Texas at Austin, Texas, U.S.A.

Education

University of Texas at Austin — **Texas, U.S.A**
Ph.D Student of Computer Science — *August 2022 - Present*
- Advisor: **Professor Qixing Huang**.

Shanghai Jiao Tong University — **Shanghai, China**
Bachelor of Computer Science, ACM Honors Class — *September 2018 - June 2022*
- **ACM Honors Class** is an elite CS program for students ranked in the top 5% of the school.
- Advisors: **Professor Junchi Yan** and **Professor Yong Yu**.

Research Interests

My research interests lie at the intersection of **computer vision**, **computer graphics**, and **machine learning**, with a specific emphasis on alingment and interaction analysis. I have explored diverse research topics, ranging from generative model for hand-object interaction, 3D fracture assembly problem, and graph matching problems, aiming to develop algorithms that enable efficient and accurate representation for 3D world.

Publication

1. Jiaxin Lu, Gang Hua, Qixing Huang, "Jigsaw++: Imagining Complete Shape Priors for Object Reassembly", Under Review, [arXiv:2410.11816]
2. Jiaxin Lu*, Yongqing Liang*, Huijun Han*, Jiacheng Hua*, Junfeng Jiang†, Xin Li†, Qixing Huang†, "A Survey on Computational Solutions for Reconstructing Complete Objects by Reassembling Their Fractured Parts", Under Reivew, [arXiv:2410.14770]
3. Jiaxin Lu, Hao Kang, Haoxiang Li, Bo Liu, Yiding Yang, Qixing Huang, Gang Hua, "UGG: Unified Generative Grasping ", *ECCV 2024 (Oral)*, [arxiv:2311.16917]
4. Jiaxin Lu*, Yifan Sun*, and Qixing Huang, "Jigsaw: Learning to Assemble Multiple Fractured Objects", *NeurIPS 2023* [arxiv:2305.17975]
5. Zetian Jiang*, Jiaxin Lu*, Haizhao Fan, Tianzhe Wang and Junchi Yan, "Learning Structured Universe Graph with Outlier OOD Detection for Partial Matching", Under Review, [arxiv:2210.10374]
6. Jiaxin Lu*, Zetian Jiang*, Tianzhe Wang and Junchi Yan, "M3C: A Framework towards Convergent, Flexible, and Unsupervised Learning of Mixture Graph Matching and Clustering", *ICLR 2024*, [arxiv:2310.18444]

*, † *denotes equal contribution*

Research Experience

Adobe — **San Jose, U.S.A**
Reserach Intern, Advised by **Dr. Yi Zhou** — *May 20224 - present*

- **Generative Human-object interaction**
  - Construct a large-scale, industry-standard human-object interaction dataset with Mocap, large language model, and tracking algorithms.
  - Design a retrival-based model for generating long sequence text to human-object interaction utilizing the created dataset.

Wormpex AI Research LLC — **Bellevue, U.S.A**
Research Intern, Advised by **Dr. Gang Hua** — *May 2023 - August 2023*

- **Dexterous Grasp Generation**
  - Introduced a unified diffusion model UGG for hand-object interaction tasks. This model brings grasping, object generation, and affordance analysis into a cohesive framework, advancing state-of-the-art in robot grasping and opening up possibilities for human-centric object design.
  - First author paper accepted by *ECCV 2024* as *Oral*.

Department of Computer Science, University of Texas at Austin **Texas, U.S.A.**
Graduate Researcher, Advised by **Prof. Qixing Huang** *August 2022 - present*

- **Imagining Complete Shape Priors for Object Reassembly**
  - Introduced a generative model Jigsaw++ for generate complete shape priors based on partially assembled objects. Designed algorithm based on rectified flow for point cloud generation with arbitrary number of points and a 'retargeting' strategy for reconstruction.
  - Submitted a paper to *ICLR* as the first author.
- **Learning to Assemble Multiple Fractured Objects**
  - Proposed Jigsaw, a novel joint learning framework for multi-part fracture assembly, utilizing attention-based backbone and incorporating multi-part matching formulation.
  - First author paper accepted by *NeurIPS 2023*.

Research Intern, Advised by **Prof. Qixing Huang** *May 2021 - January 2022*

- **Conformal Mesh Parameterization**
  - Proposed an edge based conformal parameterization method for closed surface and developed an end-to-end learning framework for computing conformal parameterization of surfaces.

ThinkLab, Shanghai Jiao Tong University **Shanghai, China**
Undergraduate Researcher, Advised by **Prof. Junchi Yan** *July 2020 - August 2022*

- **Universe Model for Partial Graph Matching**
  - Proposed an end-to-end learning pipeline for partial matching problem with universe metric learning and outlier-aware loss, showcasing significant robustness in complex extension cases with notable improvement in time and space efficiency.
  - Submitted a paper to *ICLR* as a joint first author.
- **Joint Graph Matching and Clustering**
  - Proposed an efficient and convergence guaranteed Minorize Maximization algorithm (M3C) to solve graph matching problem under mixture of graph modes. Developed an unsupervised learning model (UM3C) with edge-wise affinity learning and pseudo label selection techniques.
  - First author paper accepted by *ICLR 2024*.

Selected Awards and Honors

- Excellent Bachelor Thesis (Top 1%) of Shanghai Jiao Tong University *2022*
- Shanghai Excellent Graduate (Awarded for overall performance in undergraduate career) *2022*
- Zhiyuan Outstanding Student Scholarship (Highest award for undergraduate in SJTU) *2022*
- Shanghai Scholarship (Top 0.2% in Shanghai) *2021*
- Rank 3rd in CCPC WomenFINAL (Out of 85 teams) *May 2017*

Teaching Experience

- Teaching Assistant, CS395T: Numerical Optimization for Graphics/AI, UT Austin, *Spring 2024*
- Teaching Assistant, CS376: Computer Vision, UT Austin, *Spring 2023, Fall 2023*
- Teaching Assistant, CS303E: Elements of Programming, UT Austin *Fall 2022*
- Teaching Assistant, CS151: C++ Programming (Honors), SJTU *Fall 2020, Fall 2019*

Computer and Language Skills

- **Programming Language:** Proficient in C++, Python, Java, MATLAB, and Verilog HDL.
- **Deep Learning Libraries:** Proficient in Pytorch and Tensorflow.
- **Language:** Mandarin (native), English (fluent).