

JIAXIN LU

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

EDUCATION

University of Texas at Austin

Ph.D Student of Computer Science

– Advisor: **Professor Qixing Huang**.

Texas, U.S.A

August 2022 - Present

Shanghai Jiao Tong University

Bachelor of Computer Science, ACM Honors Class

– **ACM Honors Class** is an elite CS program for students ranked in the top 5% of the school.

– Bachelor Thesis: Machine Learning Methods on Graph Matching

– Advisors: **Professor Junchi Yan** and **Professor Yong Yu**.

Shanghai, China

September 2018 - June 2022

RESEARCH INTERESTS

My research interests lie at the intersection of **computer vision**, **computer graphics**, and **machine learning**, with a focus on addressing challenges related to 3D object geometric analysis. Currently, my research focuses on the 3D fracture assembly problem and dexterous grasp generation. With a background in graph matching and mesh parameterization, I aim to develop algorithms that enable efficient and accurate representation for 3D world.

PUBLICATION

1. Jiaxin Lu, Hao Kang, Haoxiang Li, Bo Liu, Yiding Yang, Qixing Huang, Gang Hua, “UGG: Unified Generative Grasping”, *Under Review* [arxiv: 2311.16917]
 2. Jiaxin Lu*, Yifan Sun* and Qixing Huang “Jigsaw: Learning to Assemble Multiple Fractured Objects”, *NeurIPS 2023* [arxiv: 2305.17975]
 3. Zetian Jiang*, Jiaxin Lu*, Tianzhe Wang and Junchi Yan “Learning Universe Model for Partial Matching Networks over Multiple Graphs”, *Under Review, T-PAMI*, [arxiv: 2210.10374]
 4. Jiaxin Lu*, Zetian Jiang*, Tianzhe Wang and Junchi Yan “M3C: A Framework towards Convergent, Flexible, and Unsupervised Learning of Mixture Graph Matching and Clustering”, *Under Review, ICLR*, [arxiv: 2310.18444]
- * denotes equal contribution

RESEARCH EXPERIENCE

Wormpex AI Research LLC

Research Intern, Advised by **Dr. Gang Hua**

Bellevue, U.S.A

May 2023 - August 2023

• Dexterous Grasp Generation

- Introduced a unified diffusion model UGG for investigating hand-object interaction tasks through a perspective of generation. This model seamlessly brings grasping, object generation, and affordance analysis into a cohesive framework.
- Proposed a new contact anchors representation for affordance information and a physics discriminator to assess the success of hand-object grasping.
- Outperformed state-of-the-art model in grasp generation, while exhibited the unique ability to generate objects based on given hand parameters, advancing research on object representations in hand-object interaction tasks and paved the way for human-centric object design.

Department of Computer Science, University of Texas at Austin

Graduate Researcher, Advised by **Prof. Qixing Huang**

Texas, U.S.A.

August 2022 - present

• Learning to Assemble Multiple Fractured Objects

- Proposed Jigsaw, a novel joint learning framework for multi-part fracture assembly.
- Utilized attention-based feature extraction and incorporated fracture point segmentation, multi-part matching formulation, and global alignment for improved pose alignment.
- Outperformed baseline models on Breaking Bad dataset, demonstrating strong generalization ability. It is the first learning-based method designed for the assembly of multiple pieces from physically broken 3D objects.
- 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.
- Introduced cuts on surfaces and applied the parameterization method to surfaces with cuts.
- 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**

- Analyzed partial matching problem using a multi-graph matching perspective, addressing limitations of other methods in distinguishing unmatched inliers.
- Proposed an end-to-end learning pipeline with universe metric learning and outlier-aware loss.
- Outperformed state-of-the-art methods on multiple real-world datasets, showcasing robustness in complex extension cases and notably improving time and space efficiency.
- Submitted a paper to *T-PAMI* 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.
- Surpassed the state-of-the-art methods in both accuracy and efficiency.

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*
- Zhiyuan Honor Scholarship (Top 2% in Shanghai Jiao Tong University) *2018-2021*
- Rank 3rd in CCPC WFINAL (Out of 85 teams) *May 2017*

TEACHING EXPERIENCE

- 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).