

CHUNRU LIN

ACM Honor Class ◊ Shanghai Jiao Tong University

(+86) 133 5662 3708 ◊ LinChunru@sjtu.edu.cn

EDUCATION

Shanghai Jiao Tong University, *Undergraduate*
Computer Science and Technology (ACM Honor Class)

Sept. 2019 - June 2023 (expected)

Overall GPA: 3.8/4.3

DISCIPLINE COMPETITIONS

2019 CCPC, Qinhuangdao	Silver Medal, Best Women's Team
2019 CCPC Final	Silver Medal, Best Women's Team
2019 ICPC, Jakarta	Bronze Medal
2021 CCPC Girls' Competition	Gold Medal, The Third Place

RESEARCH EXPERIENCE

Shanghai Jiao Tong University

Sept. 2021 - Mar. 2022

Visiting Undergraduate Researcher in BCMI Lab, advised by Prof. Li Niu

Image Harmonization.

Combining traditional computer vision methods with deep learning to get better performance on image harmonization task. More concretely, I tried to leverage parameters of learnable LUTs as color transformation information to improve the performance of SOTA deep learning method, iSSAM.

Massachusetts Institute of Technology

May. 2022 - Dec. 2022

Visiting Student Researcher in CoCoSci Lab, advised by Prof. Josh Tenenbaum and Chuang Gan

3D Concept Grounding on Neural Fields. Yining Hong; Yilun Du; **Chunru Lin**; Joshua Tenenbaum; Chuang Gan. Accepted by **NeurIPS 2022**

In this paper, we propose 3D-CG, which utilizes the differentiable nature of neural descriptor fields (NDF) to ground concepts and perform segmentations. We define a set of neural operators, including a neural counting operator on top of the NDF. With 3D-CG, semantic and instance segmentations can emerge from question answering supervision. Our 3D-CG outperforms baseline models in both segmentation and reasoning tasks and also generalize well to unseen shape categories and real scans.

3D Concept Learning and Reasoning from Multi-View Images. Yining Hong, **Chunru Lin**, Yilun Du, Zhenfang Chen, Joshua B. Tenenbaum, Chuang Gan. Submitted to **CVPR 2023**.

We propose the novel task of 3D concept learning and reasoning from multi-view images. By having robots actively explore the embodied environments, we collect a large-scale benchmark on 3D multi-view visual question answering (3DMV-VQA). We devise a model that incorporates a neural radiance field, 2D pretrained vision and language model, and neural reasoning operators to ground the concepts and perform 3D reasoning on the multi-view images. We illustrate that our model outperforms all baseline models and perform an in-depth analysis of the challenges of this new task and highlight potential future directions.

Vision-Language Task Annotation for Soft Body Manipulation

We try to build a framework that connects language, visuals, and low-level physics. We visual and low-level symbolic information as a description of the task constraints, emphasizing the importance of motion constraints and the visual components to describe shapes. We implement a simple-to-use API for task annotation and demonstration collection. We leverage constrained optimization with differentiable physics as a cheap tool for demonstration generation and leaving spaces for future methods.

SELECTED PROJECTS

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|---|------|
| A Toy CPU | 2020 |
| <ul style="list-style-type: none">· Hardware Programming Language Verilog· Tomasulo Out of Order Algorithm | |
| A Toy Compiler | 2021 |
| <ul style="list-style-type: none">· For C++-like Language· Similar IR Design to LLVM | |
| A Benchmarked Dataset and Baseline for Pointed Object Detection | 2021 |
| <ul style="list-style-type: none">· Building a synthesis dataset based on ScanNet and rigid human models. Proposing a novel task of pointed object detection. | |

TEACHING EXPERIENCE

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|---|---------------|
| Student Instructor
<i>Principle and Practice of Computer Algorithms</i> | 2020.6-2020.8 |
| Teaching Assistant
<i>Computer System</i> | 2021.9-2022.1 |

SKILLS AND INTERESTS

- Programming**
C++/Python/Java/Rust/Verilog
- Language**
English (TOFEL 90/120), Sanskrit (Beginner)
- Instrests**
Movie/Music/Board Games

AWARDS

- | | |
|---|------------------|
| The Second Prize Scholarship for Outstanding Undergraduate, SJTU | 2020 |
| The Sheng Scholarship | 2020, 2021, 2022 |
| Zhiyuan Honor Scholarship | 2020, 2021, 2022 |