

CHUNRU LIN

ACM Honors Class \diamond Shanghai Jiao Tong University
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EDUCATION

Shanghai Jiao Tong University , <i>Undergraduate</i>	<i>Sept. 2019 - June 2023 (expected)</i>
Computer Science and Technology (ACM Honors Class)	Overall GPA: 3.8/4.3 (Rank: 7/29)

DISCIPLINE COMPETITIONS

2018 NOI	Silver Medal
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

Massachusetts Institute of Technology	May. 2022 - Dec. 2022
<i>Visiting Student Researcher in CoCoSci Lab, advised by Prof. Josh Tenenbaum and Chuang Gan</i>	

3D Concept Grounding on Neural Fields. Yining Hong, Yilun Du, **Chunru Lin**, Joshua B. 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 generalizes 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, a 2D pretrained vision-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 use 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.

Shanghai Jiao Tong University	Sept. 2021 - Mar. 2022
<i>Undergraduate Researcher in BCMI Lab, advised by Prof. Li Niu</i>	

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

SELECTED PROJECTS

A Toy CPU 2020

- Hardware Programming Language Verilog
- Tomasulo Out of Order Algorithm

A Toy Compiler 2021

- For C++-like Language
- Similar IR Design to LLVM

A Benchmark Dataset and Baseline for Pointed Object Detection Task 2021

- A synthesis dataset based on ScanNet and rigid human models.
- A novel task of pointed object detection.

TEACHING EXPERIENCE

Student Instructor 2020.6-2020.8

Principle and Practice of Computer Algorithms

Teaching Assistant 2021.9-2022.1

Computer System

SKILLS AND INTERESTS

Programming

C++/Python/Java/Rust/Verilog

Language

Mandarin (native), English (TOFEL 90/120), Sanskrit (Beginner)

Interests

Movies/Music/Board Games

AWARDS

Academic Excellence Scholarship, SJTU (Top 5%) 2022

The Sheng Scholarship, SJTU (1 each year) 2020, 2021, 2022

Zhiyuan Honorary Scholarship 2020, 2021, 2022