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Juexiao ZHANG

GitHub: JuexZZ

Education

MSc. in Computer Science, Courant Institute, New York University, *GPA 3.9/4.0* — Sept. 2022 — Jun. 2023
Bachelor of Electrical Engineering, Tsinghua University, *GPA 3.7/4.0* — Aug. 2016 — Jun. 2020
Exchange student in Computer Science, Univeristy of British Columbia, *GPA 3.8/4.0* — Jan. 2019 — May 2019

Publication

Juexiao Zhang*, Yiming Li*, Dekun Ma, Yue Wang, Chen Feng, "Multi-Robot Scene Completion: Towards Task-Agnostic Collaborative Perception", *6th Annual Conference on Robot Learning*, 2022. (Accepted)

Research Experience

AI4CE Lab, New York University — **New York, NY**
Research Assistant with Prof. Chen Feng — *Jan. 2022 — present*

- Working on learning scene representation through collaboration between multiple robots.
- Working on incorporating multi-modal data for representation learning in the collaborative robot perception settings.
- Built a task-agnostic framework for collaborative perception based on multi-robot scene completion task. Developed a transformer autoencoder model that amortizes communication cost in spatial-temporal domain. Submitted to CoRL 2022.

Baidu Inc. AI Research — **Beijing, China**
Machine Learning Research and Development, Intern — *Sept. 2020 — Jan. 2021*

- Focused on modeling disambiguated word sense representations to improve word representations in Chinese.
- Harvested and processed a Chinese dictionary dataset from published Chinese dictionaries and Baidu's Chinese Encyclopedia.
- Designed and experimented novel Transformer language models using PyTorch that are able to modeling interpretable sense representations from natural language dictionary entries. Contributed to the company's private code base.

Berkeley AI Research — **Berkeley, CA**
Research Assistant with Prof. Bruno Olshausen and Dr. Yubei Chen — *Jun. 2019 — Aug. 2019*

- Used dictionary learning and spectral clustering to decompose word embeddings into combinations of elementary factors.
- Discovered strong correspondence between the factors and semantic meanings identified by humans. Demonstrated the strength by identifying key semantic differences and improving performance in word analogy tasks.
- Provides a visualization tool to interpret word embeddings. Summarized into arxiv manuscript.

Natural Language Processing Lab, Tsinghua University — **Beijing, China**
Research Assistant — *Sept. 2018 — Jan. 2019*

- Designed pipeline, multitask and end-to-end models to incorporate multiple neural IR models and reading comprehension models to tackle the problem of open-domain text question answering.
- Experiments demonstrate the effectiveness of incorporating neural ranking models on multi-paragraph question answering.

Projects

A CUDA Solver for Poisson Problem — **April 2021 — May 2021**

- Implemented an efficient GPU conjugate gradient solver using CUDA, C++ and CMake that supports sparse matrices as inputs.
- Incorporated cuBLAS, cuSparse libraries and textual memory to improve the solver's speed and stability.

Interactive 2D Editor for Vector Graphics — **Nov. 2021 — Dec. 2021**

- Implemented ray-tracing and rasterization renderer purely based on C++ and Eigen library.
- Supports affine transforms, color modification, view control and keyframing animation using linear interpolation or Bezier curve.

Speaker Diarization Tool with Deep Clustering Models — **Nov. 2019 — Jan. 2020**

- Developed a speaker diarization system using C++ and CMake that takes audio files and output annotations in the TextGrid.
- Used TorchScript to serialize and incorporate the trained models into the system based on C++, achieving fast inference speed.

Skills

Languages and tools — C/C++, Python, LaTeX, Verilog, MATLAB, CUDA, Linux Shell, Pytorch, Git, CMake, Eigen
Related Course — Probability and Stochastic Processes (THU), Computer Graphics (CSCI-GA 2270), Mathematics of Deep Learning (CSCI-GA 3033 079), Machine Learning (CSCI-GA 2565), Computer Vision (CSCI-GA 2271)

Scholarships

National Scholarship (Top 5 of 288), Chinese Ministry of Education — 2017
Scholarship of Academic Excellence (5%), Tsinghua University — 2017