SIJIN CHEN

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EDUCATION

The Chinese University of Hong Kong (CUHK) Hong Kong

Bachelor of Science *Sep. 2019 – Present*

- Major in Computer Science; Minor in Mathematics
- Major GPA: **3.969**/4.000; Cumulative GPA: **3.884**/4.000; Ranking: ∼**1**%
- GRE General: 330/340; IELTS: 8.0/9.0 with speaking 8.0
- Honors and Awards:
  Silver Award for Outstanding Academic Performance (2022); VTech Group of Companies Scholarship (2022); Dean's List (2020–22); ELITE Stream Scholarship (2020–22); Best Project Award of Summer Research Internship (2020)
- Advanced Courses:
  Theoretical Computer Science: Advanced Algorithms, Computational Learning Theory
  Mathematics: Mathematical Analysis III, Abstract Algebra, Stochastic Processes

PUBLICATIONS

1. **Sijin Chen**, Xiwei Cheng, and Anthony Man-Cho So, *Non-Convex Joint Community Detection and Group Synchronization via Generalized Power Method*, 2021. https://arxiv.org/abs/2112.14204 (planned submission to SIAM Journal of Optimization)

2. Wu Zheng, Weiliang Tang, **Sijin Chen**, Li Jiang, and Chi-Wing Fu, *CIA-SSD: Confident IoU-Aware Single-Stage Object Detector from Point Cloud*, 35th AAAI Conference on Artificial Intelligence, 2021. https://ojs.aaai.org/index.php/AAAI/article/view/16470

RESEARCH EXPERIENCES

Convergence of compressed stochastic gradient descent

supervised by Prof. Yuejie Chi, Carnegie Mellon University *May 2022 – Present*

- Designed a communication-efficient distributed SGD algorithm with a novel error-feedback mechanism
- Proved a high-probability bound for the convergence to first-order stationary points of the proposed algorithm, using weaker assumptions and achieving stronger convergence guarantee than existing works
- Studying the second-order stationarity by analyzing the dynamics of the algorithm near the saddle points

Provably fast methods for non-convex optimization problems

supervised by Prof. Anthony Man-Cho So, CUHK *Jun. 2021 – Dec. 2021*

- Proposed a generalized power method for the joint optimization of group synchronization and community detection
- Played a major role in mathematically proving the linear convergence guarantee for the algorithm, which sharply outperforms the state-of-the-art semidefinite relaxation method in respect of time complexity
- Utilized mathematical tools including matrix theory, random graph theory, numerical analysis, etc. to develop the results
- Wrote paper [1] to present the results obtained to the academia

3D computer vision via deep learning

supervised by Prof. Philip Chi-Wing Fu, CUHK *Jun. 2020 – Nov. 2020*

- Cooperated with PhD researchers to design 3D convolutional neural networks for autonomous driving scenes
- Proposed efficient methods for data augmentation and network structure refinement, contributed substantial codes in Python, PyTorch, and CUDA for implementation and experiments
- Collaborated on the research paper [2] as research output
- Won the Best Project Award issued by the Faculty of Engineering, CUHK

LEADERSHIP

Organizer and student lecturer

at WISE, a knowledge-sharing platform at CUHK *Jan. 2021 – Present*

- Organized biweekly talks by inviting speakers from different disciplines and promoting the activity to the potential audience
- Created and maintained the official website via cooperation on GitHub with front-end and back-end technologies
- Gave two talks on non-convex optimization and basic topology to the audience from engineering background

SKILLS

Languages: English (proficient), Mandarin Chinese (native), Cantonese (conversational)
Programming: MATLAB, Python, PyTorch, C/C++, Java, HTML/CSS, LaTeX
Computer: Linux, SSH, Microsoft Office