

Zhiyu He

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Education

- 2019–Now **M.S., Control Science and Engineering.**
Department of Automation, Shanghai Jiao Tong University
Advisor: [Xinping Guan](#); (co)Advisor: [Jianping He](#)
- 2015–2019 **B.Eng., Automation.**
Department of Automation & Zhiyuan College, Shanghai Jiao Tong University
Zhiyuan Honors Program of Engineering (Top 5%)
Average Score: 92/100, Ranking: 1/91

Publications and Preprints

Under Review

- **Zhiyu He**, Jianping He, Cailian Chen, Xinping Guan, “Distributed Nonconvex Optimization: Oracle-free Iterations and Globally Optimal Solution”, ArXiv:2008.00252, submitted to IEEE Transactions on Automatic Control. [[pdf](#)]

Published or Accepted

- **Zhiyu He**, Jianping He, Cailian Chen, Xinping Guan, “CPCA: A Chebyshev Proxy and Consensus based Algorithm for General Distributed Optimization”, American Control Conference (ACC), 2020. [[pdf](#)]
- **Zhiyu He**, Jianping He, Cailian Chen, Xinping Guan, “Constrained Distributed Nonconvex Optimization over Time-varying Directed Graphs”, IEEE Conference on Decision and Control (CDC), 2020, accepted.

Selected Honors and Awards

- 2019 Outstanding Graduate of Shanghai
2019 Zhiyuan Honor Degree of B.Eng. (52/3500 recipients in class of 2019)
2019 Zhiyuan Outstanding Student Scholarship (30/3500 recipients in class of 2019)
2018&2016 China National Scholarship
2017 Samsung Scholarship
2017 A-class Scholarship for Excellent Academic Performance (Top 1% in SJTU)

Research Experience

- Nov. 2018 - *Polynomial-approximation-based Algorithm for Distributed Optimization*
Now Supervisor: Prof. Jianping He and Prof. Xinping Guan, Dept. of Automation, SJTU
- Proposed a novel algorithm, CPCA, based on Chebyshev polynomial approximation, consensus and polynomial optimization via semidefinite programming.

- Proved that CPCA yields ϵ globally optimal solutions for any arbitrarily small given error tolerance ϵ , and showed that it achieves distributed termination once the precision requirement is met.
- Provided explicit expressions for the communication and zeroth-order oracle complexities of CPCA.
- Extended CPCA to meet various application needs, including dealing with time-varying directed graphs, preserving privacy of agents, and enhancing resilience against dishonest agents (on-going work).

Febr. 2017 - *Predicting Protein Contact Maps Through Deep Learning Models*

Febr. 2018 Supervisor: Prof. Hongbin Shen, Dept. of Automation, SJTU

- Extracted useful features from the sequence information of proteins.
- Developed three models for predicting contact maps by using three both distinct and interrelated network structures of deep learning.
- Conducted extensive evaluations and comparison of the developed models.
- Modeled the spatial structures of specific proteins in the test sets based on the predicted contact maps.

Febr. 2018 *Study of the Impact of Climate Change on Regional Stability*

2018 Interdisciplinary Contest in Modeling (ICM)

Supervisor: Prof. Xiaofeng Gao, Dept. of Computer Science and Engineering, SJTU

- Built a three-level index system to offer a concrete measure of the stability of a country. Twenty typical and representative basic indicators are carefully selected.
- Conducted case studies of Afghanistan and Cambodia to qualitatively reveal the mechanisms that climate factors may follow to affect the regional stabilities.
- Proposed various feasible strategies tailored to the target countries' needs to improve their resilience against the climate change. The effectiveness of these strategies are validated through extensive experiments.

Invited Talk

July 2020 "Non-convex Distributed Optimization: Novel ALgorithmic Design and Arbitrary Precise Solution", Intelligent Control Forum (Online), Peking University, China. [\[slides\]](#)

Additional Information

Skills and Languages

Programming MATLAB, Python, C++

Languages Chinese, English (TOEFL:111, GRE:328+3.5)

Extracurricular Activities

2019 & 2018 & 2017 Volunteers of Shanghai International Marathon

Sept. 2015 - Member of the Press Office, Publicity Center of Youth League Committee, SEIEE,
Oct. 2017 SJTU

2016 Student Librarian of SJTU