

Hengyu Fu

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EDUCATION

PEKING UNIVERSITY

Sep. 2021 - Jul. 2025 (Expected)

*School of Mathematical Sciences: Major: **Mathematics**, Double Major: **Economics***

- **Academic Achievement:** Overall GPA: 3.90/4.00
- **Selected Coursework:** Mathematical Analysis (I) 97.5, Mathematical Analysis (II) (H) 96, Geometry(I) 98, Advanced Algebra (I) 92.5, Advanced Algebra (II) 94.5, Probability Theory 99, Real Analysis 90, Abstract Algebra 97, Intermediate Microeconomics 100.
- **Honors and Awards:** Gold Medal in the 36th China Mathematics Olympics Final (2020), Peking University 2021-2022 Third-Class Scholarship, Peking University 2021 "Jin Qin" Scholarship, School of Mathematical Sciences Social Work Award.

RESEARCH EXPERIENCE

Sparse Learning with Branch-and-Bound Solver

Jan. 2023 - Present

Advisor: Prof. Rahul Mazumder, Operations Research Center (ORC), Massachusetts Institute of Technology.

- Studied various types of sparse learning problems with different regularizers and constraints and developed a generalized Branch-and-Bound solver for them.
- Designed a relaxed form of the primal mixed integer programming problem; developed an Active-Set algorithm based on a refined PGD method to solve the relaxed problem at high speed.
- Developed effective heuristic strategies that yield feasible solutions close to the optimum.
- Conducted theoretical analysis: derived the proximal operator and conjugate function of the objective function in the relaxed problem; established the theoretical guarantee for global convergence of the proposed method.
- Working on refining the Branch-and-Bound framework (e.g., designing better branching and pruning rules) and conducting appropriate numerical experiments to demonstrate its superior performance.

"SDPDAL" for Riemannian Optimization

Aug. 2022 – Jan. 2023

Advisor: Prof. Zaiwen Wen, Beijing International Center for Mathematical Research (BICMR), Peking University.

- Repackaged a decomposition augmented Lagrangian method called "SDPDAL" for low-rank SDP from MatLab into C++ and developed a software package based on this method.
- Refined the SDPDAL solver and applied it to practical problems such as coloring problems.
- Performed related numerical experiments to demonstrate its excellent performance.

STANDARDIZED TESTS

- **TOEFL iBT:** 103 (Reading 28, Listening 28, Speaking 22, Writing 25)
- **GRE General:** 328+4.0 (Verbal 162, Quantitative 166, Analytical Writing 4.0)

SKILLS & OTHERS

- **Computer Skills:** Python, MATLAB, C++, LaTeX
- **Language:** Chinese (Native), English (Fluent)
- **Student Service:** Chair of Academic Practice Department of Student Union