

EDUCATION

- **Johns Hopkins University** Baltimore, MD
Master of Science and Engineering in Applied Mathematics and Statistics; GPA: 4.0/4.0 *Sept. 2021 - Dec. 2022*
Thesis: First-Order Methods for Nonsmooth Nonconvex Functional Constrained Optimization with or without Slater Points
Advisor: Benjamin Grimmer
Courses: Nonlinear Optimization, Stochastic Optimization, Large-Scale Optimization in Data Science, Control Theory, Statistical Theory
- **Sun Yat-Sen University** Guangzhou, China
Bachelor of Science in Information and Computing Science; GPA: 3.7/4.0 *Sept. 2017 - Jun. 2021*
Thesis: On an FFHE-Inspired Method for Effectively Solving Differential Riccati Equations
Advisor: Tao Wang
Courses: Real Analysis, Linear Algebra, Numerical Methods, Statistics, Optimization Methods, Machine Learning, Data Mining, Programming

RESEARCH EXPERIENCE

- **Applications of the FFHE Method in Time-Varying Control Systems** Sun Yat-Sen University, China
Advisor: Associate Professor Tao Wang *Jan. 2020 - May 2021*
 - **Applied to CTECQP:** Implement a tailored novel fast and flexible holomorphic embedding (FFHE) method for solving continuous-time equality constrained quadratic programming (CTECQP) problems.
 - **Applied to MDRE:** Extend the FFHE method to dealing with matrix differential Riccati equations (MDRE).
 - **Promotion on FFHE:** Carry out certain strategies to optimize the series expansion, rational approximation, adaptive segmentation and automatic correction for the FFHE method and achieve better performance.
"On a Tailored Fast and Flexible Holomorphic Embedding Method for Time-Varying Control Systems" by Y. Ding, Z. Jia, Z. Fang, T. Wang, Y. Zhang, submitted to *IEEE Trans on Auto Control*.
- **The Augmented Lagrangian Method for Nonconvex Problems** Carnegie Mellon University, PA (Online)
Advisor: Assistant Professor Jovan Ilic *May 2020 - Jul. 2020*
 - **Algorithm Realization and Experimental Analysis:** Implement the augmented Lagrangian method solving nonconvex optimization problems with equality constraints; Compare its performance under different choices of related hyper-parameters and with other classic constrained methods.
"Implementation and Analyzing of Augmented Lagrangian Method" Abstract by Z. Jia, Z. Hu, J. Ma, accepted by ICAPM 2021 (presentation only).
- **First-Order Methods for Nonconvex Nonsmooth Constrained Optimization** Johns Hopkins University, MD
Advisor: Assistant Professor Benjamin Grimmer *Oct. 2021 - present*
 - **Algorithm Design and Theoretical Analysis:** Present a modified inexact proximal guided switching subgradient method solving nonconvex nonsmooth constrained optimization problems based on newly proposed Slater point-type assumptions and measurements of stationarity; Provide theoretical results on its convergence rates, feasibility guarantee and compactness assumption; Conduct numerical experiments on sparse phase retrieval problems.
- **The SPSA method for Constrained Stochastic Optimization** Johns Hopkins University, MD
Advisor: Professor James Spall *May 2022 - present*
 - **SPSA-based Constrained Algorithms:** Propose an SPSA-based switch updating method and an SPSA-based random-search projection method built on the simultaneous perturbation stochastic approximation (SPSA) solving constrained stochastic problems under specific assumptions; Show convergence results and numerical performance of them.
 - **Distributions of SPSA Sampling:** Generate computational and experimental results on the advantages of non-Bernoulli distributions compared to using Bernoulli distribution in SPSA sampling for specific constrained cases.
- **Stochastic Gradient Descent Methods with Stochastic Polyak Stepsizes** Johns Hopkins University, MD
Advisor: Assistant Professor Nicolas Loizou *Jun. 2022 - present*
 - **SPS in Different Problem Settings:** Apply two variants of stochastic Polyak stepsizes (SPS) to the stochastic gradient descent method solving weakly convex and sharp stochastic optimization problems and present their convergence results.
 - **SPS in Constrained Algorithms:** Apply one variant of SPS to the stochastic switching subgradient method solving constrained stochastic optimization problems and present its convergence result.

AWARDS

- Third Prize of China Undergraduate Mathematical Contest in Modeling (top 40%) in Sept. 2019
- Ranked 6th in Datathon@LISH in Feb. 2022

SKILLS

- **Programming Languages:** C, C++, Python, Matlab, SQL, R