SIQI HE

I am a math graduate from ETH with 1.5 year research experience in mathematical optimization. I specialize in stochastic models, mathematical optimization and coding.

Email: **siqisiqihe@gmail.com**   Phone: **+41764037015**   Location: **Zurich, SWITZERLAND**   Birthday: **25 March 1997**

WORK EXPERIENCE

Underwriting Data Scientist, Dec 2024 - Ongoing, Descartes Underwriting

Project Consultant, Sept 2024 - December 2024, ETH Juniors

- Did a project in operations research. Built a route optimization model for a start-up.

Research Assistant in Operations Research, March 2023 - October 2024, University of Zurich

- I was in charge of developing mathematical models behind dynamic pricing algorithms, where I solved mixed integer mathematical optimization problems using approximation methods. CPLEX   Operations Research

- Paper submitted to OR Spectrum: Dynamic Pricing of Extra Seats under the Nested Logit Model

QTC Participant, October 2022, Jane Street

- Participated in a trading camp held by Jane Street in London. Learned basic knowledge about market making, arbitrage, etc.

Teaching Assistant for two semesters, ETH Zurich

- Mathematics of Machine Learning, given by Prof. Afonso Bandeira, Feb 2022 - July 2022. Machine Learning Theory
- Complex Analysis given by Prof. Afonso Bandeira, Sep 2020 - Dec 2020

EDUCATION

ETH Zurich, Master in Applied Mathematics, Sept 2019 – Dec 2022

- Master Thesis: Sample Complexity Bounds for Threshold Function Class in Active Learning with Abstention.
- Specialized: Mathematical Programming, Machine Learning Theory, Graph Theory, and Actuarial Mathematics.

Zhejiang University, Bachelor in Applied Mathematics with double degree in English Literature, Sept 2015 – July 2019

- Admitted to Chu Kochen Honors College (Honors Program of Science for top 5% students).
- Received Third Class Honors College Scholarship.
- Bachelor Thesis: Representation of Cubic Splines on Planar Physical Regions and Boolean Algebra.
- Specialized: Numerical Computing, Numerical Analysis, Data Structure and Algorithms, Numerical Optimization, Linear Algebra.

PROJECTS

Master Thesis Student, Feb 2022 - July 2022, ETH Zurich, Prof. Afonso Bandeira and Dr. Nikita Zhivotovskiy

- Proved that for the class of threshold functions, the sample complexity of active learning algorithm through abstention can be improved from $O\left(\log^2 \frac{1}{\epsilon}\right)$ to $O\left(\log \frac{1}{\epsilon}\right)$.
- Did a survey on statistical learning theory. Statistical Learning Theory

Bachelor Thesis Student, Zhejiang University, Jan 2019 - May 2019, Prof. Qinghai Zhang

- Based on CGAL, implemented an algorithm computing intersection points of an arbitrary set of cubic rational curves.
- Computed the intersections by adapting Bentley–Ottmann sweep line algorithm into a space sweep algorithm, which

decreases the complexity to $O((n + k)\log n)$.

Visiting Student Researcher, UC Davis, July 2018 - Sept 2018, Prof. Zhaojun Bai

- Implemented in Matlab a method to simulate human gait patterns using principal component analysis. Made adjustments to generate walking patterns with different properties.

Research Project Participant, Zhejiang University, Mar 2017 - April 2018, Prof. Qinghai Zhang

- Collaborated with 2 other students implement the interface tracking in Matlab, which successfully tracks the interface of any given flow and under any given velocity field like translation, rotation, vortex, and deformation.
- Computed the intersection of material and interface cell by a tetrahedron clipping algorithm.

COMPETITIONS

Second Prize Team, ETH Datathon, April 2024, ETH Analytics Club, Axpo Group

- Our team forecasted PV production using XGBoost, subsequently trading on the spot and intraday markets, and generated the second-highest PnL. Python   Energy Trading

Bronze Model, Kaggle Credit Risk Model Stability, Home Credit Group

- Feature engineering on 465 native features including personal information, consumption records and credit card

information. Data Analysis   Python

- Used decision tree models to predict which customers are more likely to default on loans.

Second Prize Team, Blockchain Hackathon Participant, October 2023, ETH Juniors, VARO Energy

- During the two-day Hackathon, our team came up with a business idea to offer customers on marketplaces an option to buy tokenized carbon credit certificates to compensate $CO2$ emission. Our team completed coding tasks and pitched the idea and won the second prize. Business Idea

SKILLS AND INTERESTS

Programming Languages Python, Matlab, SQL, R, C   **Languages** Chinese (native), English (C2), French (A2, ongoing)

Hobbies

Waltz, quickstep, cooking, wine tasting (degree 2 certificate), philosophical discussion concerning culture and society.