Yuheng Lan

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RESEARCH INTEREST

Use mathematics and computer science as tools and finance as objects to carry out theoretical and practical research at the intersection of these fields.

EDUCATION

Shandong University   **Qingdao, China**

Master of Financial Mathematics and Financial Engineering   *Sep. 2020 - Present*

- **GPA:** 3.8/4.0
- **Honors:** Freshman scholarship, Academic Scholarship, Merit Student of Shandong University
- **Financial Mathematics Coursework:** Advanced Probability, Stochastic Process, BSDE
- **Pure Mathematics Coursework:** Differential Geometry, PDE of Second Order, Sobolev Space

Dalian University of Technology   **Dalian, China**

Bachelor of Information and Computing Science   *Sep. 2016 - Jun. 2020*

- **GPA:** 84.9/100
- **Selected Honors:** First class scholarship in 2016 (Top 5%), Lingshui scholarship (Top 5%), Merit Student of Dalian University of Technology (Top 5%).
- **Basic Mathematics Coursework:** Real Variable Function Theory, Functional Analysis, Probability Theory and Mathematical Statistics
- **Computational Mathematics Coursework:** Numerical Algebra, Numerical Approximation and Computational Geometry, Numerical Solution of Differential Equation, Optimization Method
- **Computer Science and Data Science Coursework:** C++ Language and Data Structure, Machine Learning and Data Mining, Mathematical Software and Experiment

RESEARCH EXPERIENCE

Optimization of portfolio based on momentum effect and inflation   *Jun. 2022 - Present*

Research Assistant, **Advisor:** *Prof. Hanwu Li*

- Transformed the problem into Backward Differential Equation form (BDSE), and used its convexity to obtain the saddle point of the variational form, obtaining the analytical solution of the optimal investment portfolio.
- Calculated the numerical approximate solution of the optimal portfolio corresponding to the stochastic differential equation using the particle swarm algorithm.

Boundary Extensions For Mappings Between Metric Spaces   *Sep. 2020 - Jun. 2022*

Research Assistant, **Advisor:** *Prof. Changyu Guo*

- Extended the general Whitney decomposition to a Dyadic-Whitney decomposition, enabling it to hold the metric space.
- Generalized the corresponding results of existence and uniqueness to φ-length John in metric spaces.

High-dimensional Data Analysis Based On PICASSO *Sep. 2019 - Jun. 2020*
Research Assistant, **Advisor:** *Associate Prof. Min Xu*

- Researched the theoretical background and algorithm framework of the PICASSO algorithm, as well as the relationship and function of each component.
- Achieved a classification recognition rate is 83%, and a recognition rate of facial expressions such as happiness and surprise as high as 99% by applying the PICASSO algorithm to the JAFFE facial expression database and classifying using sparse logistic regression.

Research and Application of Deep Learning *Sep. 2017 - Jun. 2019*
Research Assistant, **Advisor:** *Prof. Chao Zhang*

- Researched the basic models of deep learning (RNN, LSTM, BT-RNN, wavenet, p-wavenet, clarinet) and compared the main advantages and disadvantages of common speech noise reduction models.

RELATED PROJECTS

Fundamentals of Computer Science in C++ *Sep. 2017 - Dec 2017*

- Implemented fundamental **data structures** and their corresponding problems.

Mathematical Modeling Basics in C++ *Mar. 2018 - May 2018*

- Learned the core mathematical modeling implementations by writing over 1000 lines of code.
- Implemented several mathematical models and numerous graph theory algorithms.

Mathematical Modeling Basics in MATLAB *Jun. 2018 - Jul. 2018*

- Implemented a basic recognition model to recognize digits from 0 to 9 from an image; Achieved a recognition rate as high as 99% and recognized a combination of multiple strings of numbers.

Computational Mathematics Basics in MATLAB *Sep. 2018 - Dec. 2018*

- Drew **numerical approximation** images of Bezier curves and surfaces.
- Implemented multiple algorithms in **numerical algebra** (Jacobi iteration method), **optimization** (Steepest Descent and Newton in 1D/2D methods) and **numerical solution of differential equations** (5-point difference method on rectangular networks).

SKILLS & INTERESTS

Programming skills: C++, MATLAB, LaTeX, Python (numpy, pandas, matplotlib), R
Languages: Mandarin (native), English (IELTS 6.5)
Interests: Swimming, reading books, watching movies