Kai Fung (Kelvin) KAN

Department of Mathematics, Emory University

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Education

Emory University **USA**

Ph.D. in Mathematics 2018 - Present

Advisors: Prof. Lars Ruthotto and Prof. James Nagy

The Chinese University of Hong Kong **Hong Kong**

M.Phil. in Mathematics 2016 - 2018

Advisor: Prof. Raymond Honfu Chan

The Chinese University of Hong Kong **Hong Kong**

B.Sc. in Mathematics 2012 - 2016

Research Interest

Computer Vision, Data Mining, Financial Mathematics, Hyperspectral Analysis, Image Processing, Machine Learning, Optimization and Scientific Computing, with applications to Engineering and Finance

Publications

[1] R. Chan, K. Kan and A. Ma, “An upper bound for ex-post Sharpe ratio with application in performance measurement”, *The Journal of Performance Measurement*, 22 (2017), 7-19

[2] R. Chan, K. Kan and A. Ma, “An integer programming based strategy for Asian-style futures arbitrage over the settlement period”, *Algorithmic Finance*, 7 (2018), 31-42

[3] R. Chan, K. Kan and A. Ma, “Computation of implementation shortfall for algorithmic trading by sequence alignment”, *The Journal of Financial Data Science*, 1 (2019), 88-97

[4] R. Chan, K. Kan, M. Nikolova and R. Plemmons, “A two-stage method for spectral-spatial classification of hyperspectral images”, *Journal of Mathematical Imaging and Vision*, (2020), 1-18

[5] K. Kan, S. Wu Fung and L. Ruthotto, “PNKH-B: a projected Newton-Krylov method for large-scale bound-constrained optimization”, accepted for publication by *SIAM Journal on Scientific Computing*

[6] K. Kan, J. Nagy and L. Ruthotto, “Avoiding the double descent phenomenon of random feature models using hybrid regularization”, submitted, *arXiv preprint* arXiv: 2012.06667, (2020)

Professional Experience

Amazon **Germany**

Applied Science Intern June 2021 - Present

- Conduct Machine Learning research on the topic of “Multivariate Time Series Forecasting”

Department of Mathematics, Emory University **USA**

Course Instructor Aug. 2020 - May 2021

- Taught two undergraduate Mathematics courses
- MATH111 Calculus I (Fall 2020, Spring 2021)

Argonne National Laboratory **USA**

Summer Research Intern June 2020 - Aug. 2020

Mentors: Dr. Prasanna Balaprakash and Dr. Sandeep Madireddy

- Conducted Machine Learning research on the topic of "Spatio-Temporal Image Processing with Neumann Networks"
- Extended the Neumann Network framework to spatio-temporal image processing
- Improved the performance of the original Neumann Network framework

Department of Mathematics, Emory University **USA**

Teaching Assistant Aug. 2018 - May 2020

- Graded or taught the lab sessions of courses offered by the Department of Mathematics
- MATH346 Introduction to Optimization Theory (Fall 2018, Spring 2019)
- MATH221 Linear Algebra (Fall 2019, Spring 2020)

Department of Computer Science, Wake Forest University **USA**

Research Associate June - July 2017

Advisor: Prof. Robert Plemmons

- Conducted Hyperspectral Analysis research on the topic of "hyperspectral classification"
- Developed an algorithm to classify hyperspectral data, which utilizes spectral variability and spatial homogeneity of the data
- Presented in weekly meeting of computer science research group in WFU

Department of Mathematics, The Chinese University of Hong Kong **Hong Kong**

Teaching Assistant 2016 - 2018

- Taught 5 tutorial classes in both undergraduate and graduate levels, offered by the Department of Mathematics
- MATH1020 General Mathematics and MATH1520 University Mathematics for Applications (Fall 2016)
- MATH1510 Calculus for Engineers (Fall 2017)
- MATH4210 Financial Mathematics and MATH5250 Financial Mathematics (Spring 2018)

Department of Mathematics, The Chinese University of Hong Kong **Hong Kong**

Research Assistant Jan. - May 2016

Advisor: Prof. Raymond Honfu Chan

- Conducted Financial Mathematics research on the topic of "relationship between Sharpe ratio and maximum drawdown"
- Derived an upper bound for Sharpe ratio which can serve as a quick sanity check on performance reports
- Results have been published in *The Journal of Performance Measurement*

CASH Algo Finance Group Limited **Hong Kong**

Summer Intern June - Aug. 2015

- Worked in an algorithmic trading team
- Coded parts of algorithmic trading strategies with teammates and parts individually to test for its profitability
- Coded components of the algorithmic trading system and parsers to extract information from raw data

Presentations

1. The 2nd Conference on Investment and Risk Management, Nov. 20-22, 2015, Guilin, China
   Title: Sharpe ratio and maximum drawdown under the general distribution
2. 2017 Imaging Science Camp, Mar. 10-12, 2017, Shenzhen, China
   Title: Spectral-spatial classification of fused hyperspectral and LiDAR imagery
3. 2019 Georgia Scientific Computing Symposium, Feb. 16, 2019, Atlanta, Georgia, USA
   Title: A two-stage method for spectral-spatial classification of hyperspectral images
4. SIAM Conference on Computational Science and Engineering (CSE19), Feb. 25-Mar. 1, Spokane, Washington, USA

Title: A two-stage method for spectral-spatial classification of hyperspectral images

5. 2020 Georgia Scientific Computing Symposium, Feb. 29, 2019, Atlanta, Georgia, USA
   Title: A projected Newton-Krylov method for large-scale bound-constrained optimization

Awards

Postgraduate Fellowship (Emory)	2018 - Present
Postgraduate Studentship (CUHK)	2016 - 2018
Chung Chi College Academic Creativity Award	2015
The Scholarship for Diligent and Thrifty Students	2012

Computer Skills

MATLAB, C/C++, Python, LaTeX, Linux, MS Office

Personal Information

Citizenship: Hong Kong

Address: Room N406, Mathematics and Science Center, 400 Dowman Dr, Atlanta, GA 30307, USA

Languages: English (Fluent), Cantonese Chinese (Native), Mandarin Chinese (Fluent)

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