中文简历

陳南現任香港中文大學系統工程與工程管理系教授。他的研究興趣包括金融工程与金融科技，蒙特卡洛模擬，機器學習和應用概率。有二十餘篇文章發表在 Review of Financial Studies, Journal of Econometrics, Operations Research, Mathematics of Operations Research, Mathematical Finance, Finance and Stochastics, Journal of Economic Dynamics and Control 等運籌和數理金融領域的頂級期刊和會議論文集。陳教授之前的研究課題涵蓋信用利差模型，可轉換證券定價的隨機微分博弈，美式期權定價的蒙特卡洛方法及其敏感性分析，隨機微分方程模擬，跳擴散模型中的奇異期權定價。當前，他主要關注於系統性傳染和流動性風險的建模，複雜的社交和金融網絡，以及蒙特卡洛方法在隨機控制和強化學習中的應用。他的部分研究得到了香港研究資助局優配研究金的資助(七次)。

陳南教授分別於 1998 年和 2001 年獲得北京大學概率統計專業學士學位和碩士學位，並於 2006 年獲得哥倫比亞大學運籌專業博士學位。 2006 年獲得 INFORMS 金融服務領域最佳學生論文二等獎。 2007-2008 年擔任 Operations Research Letters 副編輯，現擔任 Mathematical Finance, International Review of Finance, Digital Finance 等雜誌的副編輯, 同时陳南教授曾多次參與組織定量金融和蒙特卡洛模擬領域的國際學術會議。

陳南教授現在為香港中文大學金融科技學工程學士學位項目主任，它是香港首個致力於在金融科技領域提供全面的本科教育的項目。陳教授同時擔任香港中文大學深圳校區金融工程理學碩士項目主管。在社會服務方面，陳教授被受邀任命為香港支付系統及儲值支付工具上訴審裁處委員。陳教授同時也是香港研究資助局工程學學科小組委員之一。

CURRICULUM VITAE

[Nan Chen]

As of 24/04/2020

PERSONAL DATA

Full Name: Nan Chen

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Dept of Systems Engineering and Engineering Management
The Chinese University of Hong Kong

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EDUCATION

2006 **PhD.**, Dept. of Industrial Engineering and Operations Research, Columbia University, USA.
Dissertation title: *Two problems in financial engineering*
Dissertation supervisors: Paul Glasserman and Steven S. Kou

2005 **MPhil**, Dept. of Industrial Engineering and Operations Research, Columbia University, USA.

2001 **MSc** (Research based), Dept. of Probability and Statistics, Peking University, Beijing, China.
Thesis title: *On a class of contact processes in* $Z \times T^d$
Thesis supervisor: Dayue Chen

1998 **BSc** (First Class honor), Dept. of Probability and Statistics, Peking University, Beijing, China. June 1998.

ACADEMIC APPOINTMENTS

2019 – Present **Professor** in Systems Engineering and Engineering Management, The Chinese University of Hong Kong.

2017 – Present **Director,** Center for Financial Engineering (CFE), The Chinese University of Hong Kong.

2017 – Present **Director,** Bachelor of Engineering Program in Financial Technology, Dept. of Systems Engineering and Engineering Management,

The Chinese University of Hong Kong.

2017– Present **Director,** Master of Science Program in Financial Engineering,
The Chinese University of Hong Kong (Shenzhen).

2012 – 2019 **Associate Professor**,
Dept. of System Engineering and Engineering Management,
The Chinese University of Hong Kong.

2006 – 2012 **Assistant Professor**,
Dept. of System Engineering and Engineering Management,
The Chinese University of Hong Kong.

VISITING POSITIONS

06/2013 – 01/2014 **Visiting Associate Professor**,
Dept. of Industrial Engineering and Operations Research,
Columbia University.

RESEARCH INTERESTS

- Financial Engineering, Financial Technology, Quantitative Finance
- Monte Carlo Simulation
- Machine Learning
- Applied Probability, Stochastic Modeling

RESEARCH GRANTS

Competitive Grants

1. **General Research Fund** (Project ID: CUHK14207918, HK$632k). 2018-2020. Project Title: *Dynamic Portfolio Selection and Option Pricing with Market Frictions*.
2. **General Research Fund** (Project ID: CUHK14237616, HK$744k). 2017-2019. Project Title: *Simulation from Characteristic Functions.*
3. **General Research Fund** (Project ID: CUHK14201114, HK$717k). 2015-2017. Project Title: *A Computational Approach for Stochastic Dynamic Programming and Its Applications in Financial Engineering.*
4. **General Research Fund** (Project ID: CUHK411113, HK$500k). 2013-2016. Principal Investigator (sole). Project Title: *Studies on Financial Systemic Risk – A Network Based Approach*.

5. **General Research Fund** (Project ID: CUHK411110, HK$668k). 2011-2013. Principal Investigator (sole). Project Title: *Monte Carlo Simulation in Financial Risk Management of Derivative Portfolios*.
6. **General Research Fund** (Project ID: CUHK411309, HK$716k). 2010-2012. Principal Investigator (sole). Project Title: *Computational methods for Option Pricing under Stochastic Volatility Jump Diffusion Models*.
7. **General Research Fund** (Project ID: CUHK411108, HK$358k). 2008-2011. Principal Investigator (sole). Project Title: *Exact Simulation Method for Stochastic Differential Equations and Its Applications in Financial Engineering*.

Non-Competitive Grants:

1. Direct Allocation Grant (Project ID: 2050371, HK$150k). Faculty of Engineering, The Chinese University of Hong Kong. 2006-2008.

AWARDS AND HONORS

1. **Exemplary Teaching Award**, Faculty of Engineering, The Chinese University of Hong Kong. 2017.
2. **Exemplary Teaching Award**, Faculty of Engineering, The Chinese University of Hong Kong. 2009.
3. **Second Place Prize, Best Student Research Paper Competition**, Section of Financial Service, INFORMS. 2006.

PROFESSIONAL SERVICES AND EDITORSHIP

Editorship

01/2020 – Present **Associate Editor**, *Mathematical Finance*.
06/2018 – Present **Associate Editor**, *International Review of Finance.*
06/2018 – Present **Associate Editor**, *Digital Finance.*
01/2007 – 12/2008 **Associate Editor**, *Operations Research Letters*.

Ad hoc reviewer

Management Sciences, Operations Research, Mathematical Finance, Finance and Stochastics, Mathematics of Operations Research, SIAM Journal of Financial Mathematics, SIAM Journal of Control and Optimization, Annals of Applied Probability, Journal of Applied Probability, Discrete Event Dynamic Systems, Journal of Economic Dynamics and Control, Journal of Theoretical and Applied Finance, Quantitative Finance, *Review of Derivative Research, Journal of Optimization, Naval Logistics Research, Optimization, Statistics Sinica, Stochastic*

Processes and their Applications, Stochastics, Transactions on Modeling and Computer Simulation, IEEE Transactions on Signal and Information Processing over Networks.

Professional Society Membership

- **Member**, Institute for Operations Research and the Management Sciences (INFORMS).
- **Member**, Society for Industrial and Applied Mathematics (SIAM).
- **Member**, Bachelier Finance Society.

Conferences Organization

- **Main Organizer**. The 11th World Congress of the Bachelier Finance Society, Hong Kong, 2020.
- **Member of Steering Committee**. The 6th Asian Quantitative Finance Conference (AQFC), Guangzhou, China. 2018.
- **Member of Steering Committee**. The 5th Asian Quantitative Finance Conference, Seoul, Korea, 2017.
- **Member of Steering Committee**. The 4th Asian Quantitative Finance Conference, Osaka, Japan, 2016.
- **Chair of Organization Committee**. The 3rd Asian Quantitative Finance Conference, Hong Kong, 2015.
- **Coordinator**. Stream of Financial Optimization, The 20th Conference of the International Federation of Operational Research Society, Barcelona, 2014.
- **Coordinator**. Stream of Financial Optimization. The 26th European Conference on Operational Research, Rome, 2013.
- **Coordinator**. Track of Risk Analysis. The Winter Simulation Conference, Washington, 2009.

Public Services

- **Member**. Payment Systems and Stored Value Facilities Appeals Tribunal, Financial Services and the Treasury Bureau, Hong Kong SAR Government. (香港特區政府財經事務及庫務局支付系統及儲值支付工具上訴審裁處成員) 11/2019 – 11/2022.
- **Member**. Engineering Panel of the Research Grants Council, University Grants Committee, Hong Kong SAR Government (香港特區政府大學教育資助委員會研究資助局工程學科小組成員) 03/2020 – 10/2022.

PUBLICATIONS (Google Scholar Citations: 829)

Working Papers

1. D. Ahn, N. Chen, and K.-K. Kim. (2020). Systemic Risk Quantification via Shock Amplification in Financial Networks. R&R under *Operations Research*.
2. N. Chen, X. Ma, and Y. Liu. (2019). Information Relaxation and Duality-Based Dynamic Programming (DDP). Submitted.
3. N. Chen, S. Kou, and Y. Wang. (2018). Transitory Behaviors of Large Sized Population Games.
4. N. Chen, Y. Tian, and J. Ji. (2020). Liquidity, Investment, and Debt Overhang.

Published Papers

Archival Journals:

1. N. Yang, N. Chen, and X. Wan. (2019). A New Delta Expansion for Multivariate Diffusions via the Ito-Taylor Expansion. ***Journal of Econometrics***, Vol. 209, pp. 256-288.
2. N. Yang and N. Chen. (2019). The Principle of Not Feeling the Boundary for the SABR Model. ***Quantitative Finance***, Vol. 19, pp. 427-436.
3. N. Chen, P. Glasserman, B. Nouri, and M. Pelger. (2017). Contingent Capital, Tail Risk, and Debt-induced Collapse. ***Review of Financial Studies,*** Vol. 30, pp. 3921-3969.
4. N. Yang, N. Chen, Y. Liu, and X. Wan. (2017). Approximate Arbitrage-Free Option Pricing under the SABR Model. ***Journal of Economic Dynamics and Control,*** Vol. 83, pp. 198-214.
5. N. Cai, Y. Song, and N. Chen. (2017). Exact Simulation of the SABR Model. ***Operations Research,*** Vol. 65, pp. 931-951.
6. N. Chen, X. Liu, and D. D. Yao. (2016). An Optimization View of Financial Systemic Risk Modeling -- The Network Effect and The Market Liquidity Effect. ***Operations Research,*** Vol. 64, pp.1089-1108.
7. C. M. Leung, N. Chen, and Y. K. Kwok. (2015). Game Options Analysis of the Information Role of Call Policies in Convertible Bonds. ***Applied Mathematical Finance,*** Vol. 22, pp. 297-335.
8. E. J. Baurdoux, N. Chen, B. A. Surya, and K. Yamazaki. (2015). Optimal Double Stopping of a Brownian Bridge. ***Advances in Applied Probability,*** Vol. 47, pp. 1212-1234.
9. N. Chen and Y. Liu. (2014). American Option Sensitivity Estimation via a Generalized IPA Approach. ***Operations Research***, Vol. 62, pp. 616–632.

10. N. Chen and Z. Huang. (2013). Localization and Exact Simulation of Brownian Motion Driven Stochastic Differential Equations. ***Mathematics of Operations Research***, Vol. 38, pp. 591-616.
11. N. Chen and Z. Huang. (2012). Brownian Meanders, Importance Sampling and Unbiased Simulation of Diffusion Extremes. ***Operations Research Letters***, Vol. 40, pp. 554-563.
12. N. Chen, M. Dai and X. Wan. (2011). A Non-Zero-Sum Game Approach for Convertible Bonds: Bankruptcy Cost, Tax Benefit and Early/Late Calls. ***Mathematical Finance***, Vol. 23, pp.57-93.
13. N. Cai, N. Chen, and X. Wan. (2010). Occupation Times of Jump-Diffusion Processes with Double Exponential Jumps and the Pricing of Options. ***Mathematics of Operations Research***, Vol. 35, pp. 412-437.
14. N. Chen and S. G. Kou. (2009). Credit Spread, Implied Volatility, and Optimal Capital Structures with Jump Risk and Endogenous Defaults. ***Mathematical Finance,*** Vol. 19, pp. 343-378.
15. N. Cai, N. Chen, and X. Wan. (2008). Pricing Double Barrier Options under a Flexible Jump Diffusion Model. ***Operations Research Letters***, Vol. 37, pp. 163-167.
16. N. Chen and P. Glasserman. (2007). Additive and Multiplicative Duals for American Option Pricing. ***Finance and Stochastics,*** Vol. 11, pp. 153-179.
17. N. Chen and P. Glasserman. (2007). Malliavin Greeks without Malliavin Calculus. ***Stochastic Processes and Their Applications,*** Vol. 117, pp. 1689-1723.

Refereed Conference Proceedings:

18. J. Blanchet, N. Chen, and P. W. Glynn. (2015). Unbiased Monte Carlo Computation of Smooth Functions of Expectations via Taylor Expansions. ***Proceedings of the 2015 Winter Simulation Conference***, pp. 360-367, IEEE.
19. D. Belomestny, N. Chen, and Y. Wang. (2014). Unbiased Simulation of Distributions with Explicitly Known Integral Transforms. ***Proceedings of the 2014 MCQMC Conference***.
20. N. Chen and Y. Liu. (2011). Sensitivity Estimation of SABR Model via Derivative of Random Variable. ***Proceedings of the 2011 Winter Simulation Conference***, pp. 3871-3881, IEEE.
21. N. Chen and Y. Liu. (2010). Pathwise Derivative Method on Single-Asset American Option Sensitivity Estimation. ***Proceedings of the 2010 Winter Simulation Conference***, pp. 2721-2731, IEEE.
22. N. Chen and Z. Huang. (2009). A Wiener Measure Theoretic Approach to Pricing Extreme-Value-Related Derivatives. ***Proceedings of the 2009 Winter Simulation Conference***, pp. 1261-1271, IEEE.

23. N. Chen and J. L. Hong. (2007). Monte Carlo Simulation in Financial Engineering. ***Proceedings of the 2007 Winter Simulation Conference,*** pp. 919-931, IEEE.

Refereed Book Chapter:

24. N. Chen. (2010). Sensitivity Computation: Integration by Parts. In ***Encyclopedia of Quantitative Finance***. Edited by Rama Cont. John Wiley and Sons, London, pp. 1636-1639.

TEACHING

Undergraduate

- SEEM4720: Computational Finance

The course provides a quantitative introduction to the applications of computational methods in financial derivative pricing. It covers two important numerical techniques: Monte Carlo simulation and finite differences. Using MATLAB as a means of illustration, the course focuses on developing numerical problem-solving capabilities for the students.

- SEEM4640: Financial Decision and Pricing Models

Basic characteristics of financial derivatives such as options, futures and forward contracts; understanding of the market mechanism of these fundamental instruments; risk management and financial derivatives; the fundamental concepts of no-arbitrage and risk neutral valuation principle; the binomial model and Black-Scholes-Merton pricing theory.

- SEEM2520: Fundamentals in Financial Engineering

Overview of financial systems and the importance of financial markets and institution; understanding of the characteristics of interest rates, bonds, stocks and foreign exchanges; banking and financial institution management.

Msc

- SEEM5870: Computational Finance

The course establishes a theoretical foundation for computational finance, covering three main principles of the subject: efficient market hypothesis, capital asset pricing model, and no arbitrage. A variety of applications of these principles, from investment opportunity evaluation to derivative security pricing, will be investigated thoroughly. The latter part of the course will concentrate on the development of some numerical

methods, such as binomial trees, and finite difference methods. These methods are popularly applied in risk management of options, futures, and other derivatives.

- MFE5110 (Shenzhen campus): Stochastic Models

Overview of financial systems and the importance of financial markets and institution; understanding of the characteristics of interest rates, bonds, stocks and foreign exchanges; banking and financial institution management.

PhD

- SEEM5670: Advanced Models in Financial Engineering

The course introduces some basic concepts of stochastic calculus, an important mathematical tool used in financial engineering, and based on it, treats systematically the theory of risk neutral pricing. It will discuss extensively various applications in option pricing and financial modeling. Finally, the course offers a brief introduction to numerical methods in finance.

- **SEEM5570: Numerical Methods in Finance**

This course emphasizes the use of numerical methods for solving financial problems. The numerical methods include, binomial trees, Monte Carlo simulation, stochastic programming, linear/quadratic control models and semidefinite programming techniques. Those techniques will be applied, among other things, to: option pricing, index tracking, portfolio optimization, interest rate models, and asset/liability management.

SUPERVISED PHD STUDENTS

1. **Xiangwei Wan** (Graduation year: **2010**).
   - Dissertation title: *A Study of Convertible Bond: Optimal Strategies and Pricing.*
   - First position after graduation: Assistant Professor, Antai Economics School, **Shanghai Jiaotong University**, China.
2. **Zhengyu Huang** (Graduation year: **2012**).
   - Dissertation title: *Exact Simulation and Importance Sampling of Diffusion Processes*.
   - First position after graduation: Quantitative Analyst, Beijing Leirui Asset Management.
3. **Yanchu Liu** (Graduation year: **2012**).
   - Dissertation title: *Monte Carlo Simulation in Risk Estimation.*
   - First position after graduation: Assistant Professor, Lingnan (University) College, **Sun Yat-Sen University**, Guangzhou, China.

4. **Nian Yang** (Graduation year: **2013**).
   - Dissertation title: *Computational Issues of Stochastic-Alpha-Beta-Rho (SABR) Model.*
   - First position after graduation: Assistant Professor, Dept. of Finance and Insurance, School of Business, **Nanjing University**, Nanjing, China.
5. **Wei Yu** (Graduation year: **2014**).
   - Dissertation title: *A Supersolution/Subsolution-Based Iteration Approach for Stochastic Dynamic Programs and Robust Stochastic Dynamic Programs*.
   - First position after graduation: Quantitative Researcher, WorldQuant, Shanghai.
6. **Xin Liu** (Graduation year: **2015**).
   - Dissertation title: *A Study on Financial Systemic Risk*.
   - First position after graduation: Assistant Professor, Dept. of Finance, Business College, **Yangzhou University**, Yangzhou, Jiangsu Province, China.
7. **Yiwei Wang** (Graduation year: **2017**).
   - Dissertation title: *Simulation and Estimation from Characteristic Functions*.
   - First position after graduation: Assistant Professor, School of Economics and Management, **Southeast University**, Nanjing, Jiangsu Province, China.
8. **Yan Wang** (Graduation year: **2018**).
   - Dissertation title: *Transitory Behaviors of Large Population Game*.
   - First position after graduation: OTC Option Department, CITIC Securities Capital Management, Shanghai, China.
9. **Xiang Ma** (Graduation year: **2019**).
   - Dissertation title: *Two Problems in Stochastic Control: A Dual Based Approach with Information Relaxation and Optimal Spread Crossing in A Limit Order Book Market*.
   - First position after graduation: Quantitative Researcher, High-Flyer Quant, Hangzhou, China.

AWARDS RECEIVED BY SUPERVIZED STUDENTS

1. Xin Liu. **Finalist** (top 5), **Best Student Research Paper Competition**, Section of Financial Service, INFORMS, 2015.
2. Xin Liu. **Second Place Prize**, **Best Student Research Paper Competition**, The 3rd Asian Quantitative Finance Conference, 2015.
3. Xiangwei Wan. **Second Place Prize**, **Best Student Research Paper Competition**, Section of Financial Service, INFORMS, 2010.
4. Xiangwei Wan. **Outstanding Thesis Award**, Faculty of Engineering, The Chinese University of Hong Kong, 2010.
5. Yifei Hao (Undergraduate student). **Honorable Mention**, Mathematical Contest in Modeling (MCM), organized by the Consortium for Mathematics and Its Application, 2008.