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Xiangshen Ye, PhD

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Education

Sep 2013 – Dec 2019 **Shanghai Jiao Tong University (SJTU), Shanghai, China**
PhD Candidate, Top 3%, Stochastic Optimization, Financial Engineering
Advisor: Prof. Xi-Ren Cao, eecao@ust.hk or xrcao@sjtu.edu.cn
Co-Advisor: Prof. Jian-Jun Gao, gao.jianjun@shufe.edu.cn

Sep 2017 – Aug 2018 **University of Illinois at Urbana-Champaign (UIUC), Urbana, U.S.A.**
Joint-PhD Student, Stochastic Learning and Optimization, Game Theory
Advisor: Tamer Başar, basar1@illinois.edu
Co-Advisor: Prof. Xi-Ren Cao, eecao@ust.hk or xrcao@sjtu.edu.cn

Sep 2012 – Jun 2013 **Tsinghua University (THU), Beijing, China**
Visiting, Undergraduate Thesis on Markov Decision Processes and Portfolio
Advisor: Prof. Li Xia, xiali5@sysu.edu.cn

Sep 2009 – Jun 2013 **Beijing University of Aeronautics and Astronautics (BUAA), Beijing, China**
Bachelor of Engineering, Top 5%, Automation Science
Advisor: Prof. Shao-Ping Wang, shaopingwang@vip.sina.com

Publications

1. Xiang-Shen Ye, Wei-Ping Wu, Jian-Jun Gao, Tamer Başar, and Xi-Ren Cao, *Discrete-Time Stochastic LQ Control with Conic Control Constraints: A Game-Theoretic Model*. Working Paper, 2020.
2. Xiang-Shen Ye, Chao Xu, and Wei-Ping Wu, *A Min Cost Flow Model of Systemic Risk Optimization*. Working Paper, 2020.
3. Xiang-Shen Ye, Ruo-Bing Xue, and Wei-Ping Wu, *Total Rewards Optimization of Conic Constrained Stochastic Linear-Quadratic Control: A Direct-Comparison Based Approach*. The 23rd International Symposium on Mathematical Theory of Networks and Systems, Hong Kong, China, July 16-20, 2018.
4. Xiang-Shen Ye, Ruo-Bing Xue, Jian-Jun Gao, Tamer Başar, and Xi-Ren Cao, *A General Framework for Optimization in Curbing Risk Contagion among Financial Networks*. The 7th Midwest Workshop on Control and Game Theory, Michigan State University, USA, April 28-29, 2018.
5. Xiang-Shen Ye, Ruo-Bing Xue, Jian-Jun Gao, and Xi-Ren Cao, *Optimization in Curbing Risk Contagion among Financial Institutes*. Automatica, 94, 214-220, 2018.
6. Xiang-Shen Ye, Ruo-Bing Xue, Jian-Jun Gao, and Xi-Ren Cao, *An Iterative Approach to Reduce Systemic Risk among Financial Institutes*. IFAC-PapersOnLine, 50(1), 9380-9385, 2017.
7. Ruo-Bing Xue, Xiang-Shen Ye, and Xi-Ren Cao, *Optimization of Stock Trading with Additional Information by Limit Order Book*. Automatica, under review, 2020.
8. Jia-Jun Shen, Xiang-Shen Ye, and Dong-Qin Feng, *A Game-Theoretic Method for Distributed Resilient Control Design in Multi-agent CPSs with Markovian and Coupled Dynamics.* International Journal of Control, accepted, 2020.
9. Francis Lin Betene, Xiang-Shen Ye, and Sheng-Qi Hao, *An Adaptive Protocol for Full Duplex Two-Way Relaying Systems with the Buffer-Aided Relay*. IET Communications, 13(1), 54-58, 2019.
10. Ruo-Bing Xue, Xiang-Shen Ye, and Wei-Ping Wu, *Optimization of Constrained Stochastic Linear-Quadratic Control in Infinite Horizon: A Direct-Comparison Based Approach.* Algorithms, 13(2), 49, 2020.

Patents

1. *A Kind of Automatic Connections*. China Patent: 201210096404.6, Year: 04/2012.
2. *A Robot Monomer for Implementation of Deformable Robots*. China Patent: 201210096328.9, Year: 04/2012.

Academic Services

1. Reviewer of Journal: Automatica, 2018.
2. Reviewer of International Symposium on Mathematical Theory of Networks and Systems (MTNS), 2018.
3. Reviewer of IEEE Conference on Decision and Control (CDC), 2018.
4. Reviewer of World Congress of the International Federation of Automatic Control (IFAC), 2017.
5. Volunteer of SAIF-Stanford Forum on Risk Management and Financial Modeling, 2014.
6. Volunteer of International Conference on Fluid Power and Mechatronics (FPM), 2011.

Industrial Interactions

Dec 2019 – present **Quant Analyst, Research on Quant Trading and Market Microstructure**
Ping An Bank Co. Ltd., Shanghai, China

- Worked in the Dept. of Financial Trading, Head Office, which has been elected as the core dealer of Interbank Market in China.
- Develop Quant Market-Making Trading Strategies and Core-System Optimization Algorithms for Fixed Income, Currencies and Commodities.
- Develop Quant Trading Strategies, based on formulation and optimization of the market microstructure (Limit Order Book) combined with Queueing Theory (Stochastic Process) and Machine Learning Algorithms.

Mar 2019 – May 2019 **Internship, Research on Model Risk Management and Control (MRMC)**
Union Bank of Switzerland (UBS), Shanghai, China

- Worked in the APAC team, reviewed models for Rates, and developed an Automatic Validation system with Machine Learning methods.
- Examined to improve model suitability, calibration, speed, accuracy, risk sensitivities, and performance under stressed market conditions.
- Worked closely with front office quants, trading desks and other risk control teams from both Shanghai and London.

Nov 2018 – Feb 2019 **Internship, Research on Asset Allocation and Financial Products**
Everbright Securities Co. Ltd., Shanghai, China

- Developed an asset allocation scheme based on Markov chain model, investing on assets of stock, fixed income, and commodities.
- The indicators such as return rate, Sharp ration, and maximum drawdown, performed better than the average asset allocation scheme.
- Wrote weekly reports on asset allocation proposals (Resistance Support Relative Strength & Multi-Factor) and dynamics of innovation funds.

Jul 2017 – Sep 2017 **Summer Internship, Project on Positions Estimating of Open Equity Funds**
Shenyin & Wanguo Securities Co. Ltd., Shanghai, China

- Estimated the positions of Open Equity Funds on different industries.
- Based on Industry Indices, we applied Machine Learning approaches to reduce the dimensions, such as Principal Component Analysis (PCA), etc.
- An obvious improvement of estimation could be obtained.

Jun 2014 – Jul 2014 **Internship, Research on Electrical Equipment and New Energy Industry**
Qilu Securities Co. Ltd., Shanghai, China

- Participated in the research on the industry of Offshore Wind Power.
- Data collection, industry research, prospect analysis, and reports writing on Electrical Equipment and New Energy.

Research Experience

Sep 2017 – present **Research Assistant, Joint-PhD Research Project "Stochastic Linear-Quadratic Control with Conic Constraints: A Game-Theoretic Model"**
Coordinated Science Laboratory, University of Illinois, Urbana, USA

- Supervised by Prof. Tamer Başar (UIUC) and Prof. Xi-Ren Cao (SJTU).
- We study the discrete-time stochastic linear-quadratic (LQ) control problem with conic control constraints in both finite and infinite horizons.
- Both multiplicative noises and disturbance are considered in a zero-sum game model, which could be applied in financial portfolio optimization.
- Based on the state separation property, we successfully derive the optimality condition and the optimal feedback control/disturbance.
- We could extend this model from the discrete case to continuous cases.

Dec 2014 – present **Research Assistant, PhD Research Project "A Sensitivity-Based View of Financial Systemic Risk Modeling"**
Department of Automation, Shanghai Jiao Tong University, Shanghai, China

- Supervised by Prof. Xi-Ren Cao (SJTU) and Prof. Jian-Jun Gao (SHUFE).
- We formulated inter-bank systemic risk as a nonlinear optimization with equilibrium constraints, which resembled a Markov Decision Problem.
- An optimal liquidation policy of the Central Bank to minimize the system's loss could be derived by the Direct-Comparison-Based Approach.
- We could extend this method from static, one-region case to multi-region and even dynamic cases.

Apr 2016 – Jul 2017 **Research Assistant, Project " Simulation Trading and Case Development"**
Shanghai Advanced Institute of Finance (SAIF), Shanghai, China

- Cooperated with Prof. Tao Wang (SAIF).
- We developed an interaction and learning platform for simulation trading, including rules designing, strategies optimization, results analysis, etc., including the case on Hedging of China Steel Industry.
- Organized weekly/monthly Training Workshops & Internal Competitions for participating the Rotman International Trading Competition, Toronto, Canada, 2017.

Sep 2012 – Jun 2013 **Research Assistant, Undergraduate Thesis "A Stock Investment Trading System Based on Markov Chains"**
Department of Automation, Tsinghua University, Beijing, China

- Supervised by Prof. Li Xia (THU) as the Undergraduate Thesis.
- A stochastic optimization algorithm based on Markov Chains was proposed to obtain higher expected return and lower risk.
- With policy iteration, a rolling portfolio optimization was achieved. Optimal policies with feedback could be determined.
- An empirical study on Chinese market showed higher efficiency and return under the new model.

Teaching Experience

Sep 2014 – Jul 2017 **Teaching Assistant, Core Courses in SAIF**
Shanghai Advanced Institute of Finance (SAIF), Shanghai, China

Financial Econometrics (for Prof. Yexiao Xu), Trading Lab (for Prof. Tao Wang), Quantitative Analysis & Modeling (for Prof. Hong Chen), Financial Ethics (for Prof. Tzu-Kuan Chiu), Business Writing (for Dr. Weiwei Liu), etc.

Mar 2015 – Jun 2015 **TA, Course "Stochastic Learning & Optimization" for Prof. Xi-Ren Cao**
Shanghai Jiao Tong University, Department of Finance, Shanghai, China

Mar 2015 – Jun 2015 **TA, Course "Discrete Event System" for Prof. Jian-Jun Gao.**
Shanghai Jiao Tong University, Department of Automation, Shanghai, China

Awards & Scholarships (selected)

Feb 2017 Award: Rotman International Trading Competition, Honorable Mention Prize
Dec 2013 Award: The National Post-Graduate Mathematic Contest in Modeling, 2nd Prize
Dec 2013 Award: The 13th National "Challenge Cup" Technology Works Contest, 1st Prize
Jun 2012 Award: The ABU Asia-Pacific Robot National Contest, 3rd Prize
May 2012 Award: The BUAA "Fengru Cup" Technology Works Contest, 1st Prize
Sep 2011 Award: The National Undergraduate Electronics Design Contest, 2nd Prize
May 2019 Scholarship: Excellent Graduate (1%), SJTU
May 2017 Scholarship: Chinese Government Scholarship (1%), CSC
May 2017 Scholarship: KoGuan Endeavor Scholarship (1%), SJTU
May 2017 Scholarship: Excellent League Member (5%), SJTU
Jun 2013 Scholarship: Excellent Graduate (5%), BUAA
Dec 2012 Scholarship: SMC Scholarship (1%), Outstanding Student (5%), BUAA

Leadership Experience

Sep 2013 – Jun 2019 Commissary in Charge of Studies, SJTU
Sep 2014 – Aug 2015 Counselor for Undergraduates, SJTU
Jul 2012 – Jun 2013 Vice-Captain of BUAA Robotics Team, BUAA
Sep 2010 – Jun 2012 Campus Ambassador, Motorola (Beijing) Inc.
Sep 2010 – Jun 2012 Director and Vice President of the Student Union, BUAA

Skills & Activities

Skills MATLAB, Python, C/C++
Languages Chinese, English, Cantonese
Certificates CFA II Candidate, Qualification of Chinese Securities and Futures
Hobbies Cooking, Guitar, Chess, Basketball