Curriculum Vitae

Yipeng Yang
Assistant Professor
Department of Mathematics
University of Houston-Clear Lake
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EDUCATION*

Ph.D. in Operations Research, Aug 2008
North Carolina State University, Raleigh, NC
Dissertation: Path Dependent Stochastic Models and Its Applications In Finance and Communications
(Advisors: Dr. Tao Pang and Dr. Robert Buche)

M.S. in Financial Mathematics, Dec 2007
Department of Mathematics,
North Carolina State University, Raleigh, NC

M.E. in Control Theory and Engineering, Mar 2003
Shanghai Jiao Tong University, Shanghai, China

B.S. in Applied Mathematics, Jul 2001
Department of Applied Mathematics,
Shanghai Jiao Tong University, Shanghai, China

B.E. in Control Theory and Engineering, Jul 2000
Shanghai Jiao Tong University, Shanghai, China
(*Multiple degrees were pursued simultaneously.)

PROFESSIONAL APPOINTMENTS

Assistant Professor of Mathematics,
Sep 2014 – present
University of Houston - Clear lake, Houston, TX

Visiting Assistant Professor of Mathematics,
May 2013 – Aug 2014
Post-doctoral fellow of Mathematics,
Sep 2010 – May 2013
University of Missouri - Columbia, Columbia, MO

Research Associate of Electrical Engineering,
Nov 2009 – May 2010
Hong Kong University of Science and Technology, Clear Water Bay, Hong Kong

Assistant Professor of Control Theory and Engineering,
Oct 2008 – Oct 2009
Shanghai Jiao Tong University, Shanghai, China

PROFESSIONAL SERVICES and MEMBERSHIPS

- Referee, *Mathematics and Financial Economics, Stochastic Models, Applied Mathematical Modelling, Asian Journal of Control, International Research Journal of Engineering Science, Technology and Innovation, Mathematical Methods of Operations Research, Journal of Optimization Theory and Applications, Annals of Operations Research, IET Control Theory & Applications, Applied Mathematics & Optimization, Journal of Control and Decision, Journal of Systems Science and Complexity, European Journal of Operational Research, Automatica, American Association for Science and Technology, SIAM Journal on Control and Optimization, International Journal of Operations Research, Mechanism and Machine Theory.*

- Member, American Mathematical Society, IEEE

HONORS and AWARDS

- Faculty Development Fund (FDF), School of Science and Computer Engineering, University of Houston - Clear Lake, 2015

- Faculty Research and Support Fund (FRSF), University of Houston - Clear Lake, 2014

- Faculty Development Fund (FDF), School of Science and Computer Engineering, University of Houston - Clear Lake, 2014

- Travel Grants, Department of Mathematics, University of Missouri - Columbia, 2011, 2012, 2013, 2014

- 5 years of full graduate scholarship, North Carolina State University, 2003 – 2008

- Excellent performance in doctoral qualifying exam on Operations Research, 26 graduate courses accomplished in the areas of Operations Research, Applied Mathematics, Statistics, and Computer Science, with GPA 4.0/4.0, North Carolina State University, 2003 – 2008

- More than 5 scholarship awards including the National Excellence Award, Shanghai Jiao Tong University, 1996 – 2003

- Gifted Class, Shanghai Jiao Tong University, 1996 – 2000

EXPERIENCE

Aug 2014 – present

Assistant Professor

Department of Mathematics, University of Houston-Clear Lake, Houston, TX

- Teaching graduate and undergraduate level mathematical and statistical courses, including Calculus I,II,III, Advanced Calculus, Probability for Actuarial Exam, Applied Statistical Models, Financial Mathematics for Actuarial Exam, Time Series, Numerical Analysis.

- Performing research on the topics of stochastic process and optimal control theory, seeking the value functions and characterizing their regularities derived from the related partial differential equations, developing new models in financial portfolio management and looking for the optimal solutions.

- Investigating the control and stability issues of dynamical systems under random environments and extending its applications to bio-dynamics control and social robots control.

- Serving the Department of Mathematics in assisting the recruitment of new students and faculties, developing new courses and attracting research funding.

May 2013 – Aug 2014   *Aug 2010-May 2013*

Visiting Assistant Professor   Post-doctoral Research Fellow

Department of Mathematics, University of Missouri - Columbia, Columbia, MO

- Taught graduate and undergraduate level mathematical courses, including Business Calculus, Calculus II,III, Matrix Theory, Discrete Mathematics, Differential Equations.

- Performed research on multi-dimensional singular stochastic control and the related zero-sum game theory, via Dirichlet form in functional analysis, and studied its application in financial portfolio management.

Nov 2009 – May 2010

Research Associate

Department of Electrical Engineering, Hong Kong University of Science and Technology, Hong Kong

- Performed research on Markov decision process, sought the optimal control strategy of continuous and discrete stochastic process via perturbation analysis.

Oct 2008 – Oct 2009

Assistant Professor

Department of Automation, Shanghai Jiao Tong University, Shanghai, China

- Taught Supply Chain Management at the graduate level.

- Performed research on optimal control and non-holonomic control and its applications in motion control in Robotics.

- Investigated the optimal investment strategy under the constant elasticity of variance model for proportional reinsurance.

May 2006 – Aug 2006

<u>Quantitative Analyst</u> (internship)

ZM Financial Systems, Inc., Chapel Hill, NC

- Investigated the effect of computer generated random number on mortgage backed securities (MBS) pricing in fixed income.

- Tested the convergence properties of different pseudo random number generating methods in MBS pricing using Monte Carlo simulation with programming C#.

Aug 2003 – Aug 2008

<u>Research Assistant/Teaching Assistant</u>

Department of Operations Research, North Carolina State University, Raleigh, NC

- Performed research on path dependent stochastic models and its applications in finance and engineering.

- Applied the numerical method to stochastic control problems and analyzed the convergence property.

- Applied the Monte Carlo simulation to MBS pricing using different random number generating methods.

- Graded homework and some exam papers for the graduate courses: Financial Mathematics, Nonlinear Programming, Linear Programming.

Sep 2000 – Mar 2003

<u>Research Assistant</u>

Department of Automation, Shanghai Jiao Tong University, Shanghai, China

- Applied soft computing technique to optimization problems. Performed simulation with programming Matlab.

JOURNAL PUBLICATIONS

1. Yipeng Yang and Allanus Tsoi, A Level Set Analysis and A Nonparametric Regression on S&P500 Daily Return, ***International Journal of Financial Studies***, 4(3) 1–24, 2016

2. Y. Charles Li and Yipeng Yang, On the paradox of pesticides, ***Communications in Nonlinear Science and Numerical Simulation***, 29(1–3) 179–187, 2015

3. Tao Pang, Yipeng Yang and Dai Zhao, Convergence Studies on Monte Carlo Methods for Pricing Mortgage-Backed Securities, ***International Journal of Financial Studies***, 3(20) 136–150, 2015

4. Yipeng Yang, A Multi-dimensional Stochastic Singular Control Problem Via Dynkin Game and Dirichlet Form, ***SIAM J. Control and Optim.***, 52(6) 3807–3832, 2014

5. Yipeng Yang, Refined Solutions of Time Inhomogeneous Optimal Stopping Problem and Zero-sum Game via Dirichlet Form, ***Probability and Mathematical Statistics***, 34(2) 253–271, 2014

6. Mou-Hsiung Chang, Tao Pang and Yipeng Yang, A Stochastic Portfolio Optimization Model with Bounded Memory, ***Mathematics of Operations Research***, 36 i4(11) 604–619, 2011

7. Mengdi Gu, Yipeng Yang, Shoude Li and Jingyi Zhang, Constant elasticity of variance model for proportional reinsurance and investment strategies, ***Insurance: Mathematics and Economics***, 46(3) 580–587, 2010

8. Yipeng Yang and Y. Charles Li, The Effect of Synchronous Firing on the Clustering Dynamics of Social Amoebae, ***Complexity***, 20(1) 16–26, 2014

9. Zhijun Li, Yipeng Yang and Jianxun Li, Adaptive Motion/Force Control of Mobile Under-actuated Manipulators with Dynamics Uncertainties by Dynamic Coupling and Output Feedback, *IEEE Trans. Control System Technology*, 18(5)1068-1079, 2010

10. Zhijun Li, Jingjing Zhang and Yipeng Yang, Motion Control of Mobile Under-actuated manipulators by Implicit Function Using Support Vector Machines, *IET Control Theory and Applications*, 4(11) 2356–2368, 2010

11. Zhijun Li, Yipeng Yang and Shiping Wang, Adaptive Dynamic Coupling Control of Hybrid Joints of Human-Symbiotic Wheeled Mobile Manipulators with Unmodelled Dynamics, *Int. J. Soc. Rob.*, 2(2) 109-120, 2010

12. Zhijun Li, Yunong Zhang, Yipeng Yang, Support Vector Machine Optimal Control for Mobile Wheeled Inverted Pendulums with Un-modeled Dynamics, *Neurocomputing*, 73(13-15): 2773-2782, 2010

13. Shaoyuan Li, Yipeng Yang and Changjun Teng, Fuzzy Goal Programming with Multiple Priorities via Generalized Varying-domain Optimization Method, *IEEE T. Fuzzy Systems* 12(5):596-605, 2004

14. Shaoyuan Li, Tao Zou and Yipeng Yang, Finding the Fuzzy Satisfying Solutions to Constrained Optimal Control Systems and Application to Robot Path Planning, *Int. J. Gen. Syst.* 33, no. 2-3, 321–337, 2004

15. Shaoyuan Li, Wu Hu and Yipeng Yang, Receding Horizon Fuzzy Optimization Under Local Information Environment With A Case Study, *Int. J. Info. Tech. and Dec. Mak.*, 3(1): 109-127, 2004

16. Shaoyuan Li and Yipeng Yang, On-line Constrained Predictive Control Algorithm Using Multi-Objective Fuzzy-optimization and a Case Study, *Fuzzy Optim. Decis. Mak.* 2, no. 2, 123–142, 2003

17. Yipeng Yang and Shaoyuan Li, New Multi-Model Approach to Nonlinear Systems Based on Satisfying Cluster, *Journal of Shanghai Jiaotong University*, 489-498, no. 4, 2003

18. Yipeng Yang and Shaoyuan Li, Fuzzy optimization algorithm and its application to visual robot path planning, *Control and Decision*, 720-725, z1, 2002

CONFERENCE or ABSTRACT PUBLICATIONS

1. Yipeng Yang, The Classical Solutions and the Regularity of the Free Boundaries in Multi-dimensional Singular Stochastic Control, 54th *IEEE Conference on Decision and Control*, Osaka, Japan, 2015

2. Yipeng Yang, Finite Horizon Time Inhomogeneous Singular Control Problem of One-dimensional Diffusion via Dynkin Game, *Joint Mathematics Meetings*, San Antonio, TX, 2015

3. Yipeng Yang, Multi-dimensional stochastic singular control problem via Dynkin game and Dirichlet form, *Joint Mathematics Meetings*, San Diego, CA, 2013

4. Yipeng Yang, Two dimensional singular control problem via Dynkin game and Dirichlet form, *IISA Conference on Probability, Statistics, and Data Analysis*, Raleigh, NC, 2011

5. Zhijun Li, Kun Yang and Yipeng Yang, Support Vector Machine Based Optimal Control for Mobile Wheeled Inverted Pendulums with Dynamics Uncertainties, 48th *IEEE Conference on Decision and Control*, Shanghai, China, 2009

6. Yipeng Yang, Portfolio Optimization with Delayed Information, *Joint Meeting of the American Mathematical Society and Shanghai Mathematical Society*, Shanghai, China, 2008

7. Yipeng Yang, Robert T. Buche, Mou-Hsiung(Harry) Chang and Vahid Ramezani, Power Control for Mobile Communications with Delayed State Information in Heavy Traffic, *IEEE Conference on Decision and Control*, San Diego, CA, 2006

8. Vahid Ramezani, Robert T. Buche, Mou-Hsiung(Harry) Chang and Yipeng Yang, Power Control for a Wireless Queueing System with Delay State Information: Heavy Traffic Modeling and Numerical Analysis, *MILCOM*, Washington D.C., 2006

9. Yipeng Yang and Shaoyuan Li, A Visual Robot Path Planning Algorithm Based on Satisficing Optimization, *Chinese Control Conference*, Hangzhou, China, 2002

PREPRINTS

1. Yipeng Yang, On The Networked Predictive Control System With Random Communication Delay, **in process**

PRESENTATIONS and INVITED TALKS

1. "Optimal Order Execution with Bounded Rate of Transaction" and "A Level Set Analysis and A Nonparametric Regression on S&P500 Daily Return", *Department of Mathematics*, University if Missouri - Columbia, MO, 2016

2. "The Classical Solutions and the Regularity of the Free Boundaries in Multi-dimensional Singular Stochastic Control", *IEEE CDC*, Osaka, Japan, 2015

3. "Optimal Order Execution with Bounded Rate of Transaction"; "Finite Horizon Time Inhomogeneous Singular Control Problem of One-dimensional Diffusion via Dynkin Game", *International IMS Workshop on Finance, Insurance, Probability and Statistics*, Rutgers University, NJ, 2015

4. "Finite Horizon Time Inhomogeneous Singular Control Problem of One-dimensional Diffusion via Dynkin Game", *Joint Mathematics Meetings*, San Antonio, TX, 2015

5. "Multi-dimensional stochastic singular control problem via Dynkin game and Dirichlet form", *Joint Mathematics Meetings*, San Diego, CA, 2013; *Department of Applied Mathematics and Statistics*, Johns Hopkins University, MD, 2012

6. "Two dimensional singular control problem via Dynkin game and Dirichlet form", *IISA Conference on Probability, Statistics, and Data Analysis*, Raleigh, NC, 2011

7. "Prospect Agents and Volatility Smile: A Microeconomic Approach", *Dept. of Systems Engineering and Management*, The Chinese University of Hong Kong, Hong Kong, 2010

8. "Portfolio Optimization with Delayed Information", *Joint Meeting of the American Mathematical Society and Shanghai Mathematical Society*, Shanghai, China, 2008

GRANT PROPOSALS

1. FRSF 2016 (Submitted)
   University of Houston - Clear Lake
   Goal: Aim to analyze the stability of regime switching dynamical systems and find ways to control.
   Role: Principal-Investigator

2. NSF-STEM 2015 (Submitted)
   University of Houston - Clear Lake
   Goal: To enhance the recruitment, retention, and education of STEM majored students.
   Role: Co-PI

3. FRSF 2014 (Awarded)
   University of Houston - Clear Lake
   Goal: The goal of this project is to study the feedback effect of trading actions on financial market, and construct a mathematical model of asset price dynamics through this novel approach. It is expected that this new model is related to theories of behavioral finance because the price of an equity is after all the equilibrium between supply and demand among the traders. Thus, traders' actions should certainly affect the asset price. This new model will then be used as the basic model in an optimal order execution problem, where the solution of the optimal value function and optimal strategy is sought.
   Role: Principal-Investigator