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Professional Experience

Associate Professor	U. of Southern California	10/2007–
Assistant Professor	U. of Southern California	9/2003 –10/2007
Dunham Jackson Assistant Professor	University of Minnesota	8/2001 – 8/2003
Graduate Teaching/Research Assistant	Purdue University	8/1997 – 8/2001

Education

Ph.D. in Mathematics	Purdue University	8/2001
M.S. in Computational Finance	Purdue University	5/2001
B.S. in Mathematics	Fudan University	7/1995

Research Interests

- Stochastic Analysis
- Backward Stochastic Differential Equations
- Numerical Methods for Stochastic Differential Equations
- Numerical Methods for Partial Differential Equations
- Mathematical Finance

Publications

0. J. Zhang, *Some fine properties of backward stochastic differential equations, with applications*, Ph.D. dissertation, Purdue University, (2001).
1. J. Ma, P. Protter, and J. Zhang, *Explicit form and path regularity of martingale representations*, Levy Processes - Theory and Applications, O.E.Barndorff-Nielsen, T. Mikosch and S.I. Resnick (Eds.), Birkhauser Boston, 337-360, (2001).
2. J. Ma and J. Zhang, *Path regularity of solutions to backward stochastic differential equations*, Probability Theory and Related Fields, **122** (2002), 163-190.
3. J. Ma and J. Zhang, *Representation theorems for backward stochastic differential equations*, Annals of Applied Probability, **12** (4) (2002), 1390-1418.
4. J. Cvitanic, J. Ma, and J. Zhang, *Efficient computation of Δ -hedges for options with discontinuous payoffs*, Mathematical Finance, **13** (1) (2003), 135-151.
5. J. Zhang, *A numerical scheme for backward stochastic differential equations*, Annals of Applied Probability, **14** (1) (2004), 459-488.

6. J. Ma and J. Zhang, *Representations and regularities for solutions to backward stochastic differential equations with reflections*, Stochastic Processes and Their Applications, **115** (4) (2005), 539-569.
7. J. Zhang, *Representation of solutions to backward stochastic differential equations associated with a degenerate forward stochastic differential equation*, Annals of Applied Probability, **15** (3) (2005), 1798-1831.
8. J. Cvitanic and J. Zhang, *The steepest descent method for forward-backward stochastic differential equations*, Electronic Journal of Probability, **10** (2005), 1468-1495.
9. J. Zhang, *The wellposedness of forward-backward stochastic differential equations*, Discrete and Continuous Dynamical Systems-series B, **6** (4) (2006), 927-940.
10. J. Zhang, *Rate of convergence of finite-difference approximations for degenerate ordinary differential equations*, Mathematics of Computation, **75** (256) (2006), 1755-1778.
11. J. Cvitanic, X. Wan, and J. Zhang, *Optimal contracts in continuous-time models*, Journal of Applied Mathematics and Stochastic Analysis, Volume 2006 (2006), Article ID 95203.
12. J. Cvitanic and J. Zhang, *Optimal Compensation with Adverse Selection and Dynamic Actions*, Mathematics and Financial Economics, 1 (1) (2007), 21-55.
13. C. Bender and J. Zhang, *Time Discretization and Markovian Iteration for Coupled FBSDEs*, Annals of Applied Probability, 18 (1) (2008), 143-177.
14. J. Ma, J. Zhang, and Z. Zheng, *Weak solutions for forward-backward stochastic differential equations - a martingale problem approach*, Annals of Probability, accepted.
15. J. Cvitanic, X. Wan, and J. Zhang, *Continuous-time Principal-Agent problems with hidden action and Lump-Sum Payment*, submitted.
16. J. Cvitanic, X. Wan, and J. Zhang, *Optimal contracting with random time of payment and outside options*, submitted.
17. S. Hamadene and J. Zhang, *The Starting and Stopping Problem under Knightian Uncertainty and Related Systems of Reflected BSDEs*, submitted.

Conference Talks

1. “*Representations and regularities for solutions to backward stochastic differential equations with reflections*”, The 3rd Colloquium on Backward Stochastic Differential Equations, Finance and Applications, (Satellite Conference of ICM 2002), Shandong University, China, August, 2002.
2. “*Representation of Solutions to BSDEs Associated with a Degenerate FSDE*”, AMS Meeting, Special Session on ”Stochastic Analysis with Applications”, Indiana University, April, 2003.
3. “*On the sharp rate of finite-difference approximations for degenerate differential equations*”, Purdue Mini-conference on Financial Mathematics, Purdue University, April, 2003.
4. “ *L^2 -modulus and Numerical Methods for BSDEs*”, Southern California Probability

- Symposium, University of California in Los Angeles, November, 2003.
5. “*L²-modulus Regularity and Numerical Methods for BSDEs*”, Workshop on Numerical probabilistic methods for high-dimensional problems in finance, American Institute of Mathematics, December, 2003.
 6. “*The Steepest Descent Method for FBSDEs*”, Workshop on Monte-Carlo Methods, Isaac Newton Institute, UK, May, 2005.
 7. “*The Wellposedness of FBSDEs*”, Fourth Colloquium on Backward Stochastic Differential Equations and Their Applications, Fudan University, China, May, 2005.
 8. “*Weak Solutions for Forward-Backward SDEs — A Martingale Problem Approach*”, Conference on Random Media and Stochastic Partial Differential Equations, University of Southern California, June, 2005.
 9. “*Continuous-time Principal-Agent problems with hidden actions*”, 30th Conference on Stochastic Processes and Their Applications, University of California at Santa Barbara, June, 2005.
 10. “*The Steepest Descent Method for FBSDEs*”, Conference on Stochastic Control and Numerics, University of Wisconsin-Milwaukee, September, 2005.
 11. “*The Wellposedness of FBSDEs*”, Conference on Martingales, Stochastic Analysis, and Potential Theory, University of Florida, November, 2005.
 12. “*Continuous Time Principal Agent Problems with Moral Hazard and/or Adverse Selection*”, Workshop on Optimization problems in financial economics, Banff International Research Station, Alberta, Canada, May, 2006.
 13. “*Optimal contracting with random time of payment and outside options*”, joint Stanford-Tsukuba/WCQF workshop on quantitative finance, Stanford University, March, 2007.

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- NSF Grant DMS-0631366, 1/2007-12/2009, PI, \$100,000

Referee for

- Annals of Applied Probability, Electronic Journal of Probability, Finance and Stochastics, Journal of Computer and System Sciences, Journal of Industrial and Management Optimization, Mathematics of Operations Research, NSA Grant Review, Oxford IMA J. Numerical Analysis, Quantitative Finance, SIAM Journal on Control & Optimization, SIAM Journal on Mathematical Analysis, Stochastic Processes and Their Applications, Journal of Applied Mathematics and Stochastic Analysis, Annals of Probability, Journal of Banking and Finance, Mathematical Finance, Journal of Theoretical Probability