Tomoyuki Ichiba

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Education

Columbia University, New York.

Ph.D. Statistics, May 2009, supervised by Prof. Ioannis Karatzas in the Department of Mathematics, Columbia University.

DISSERTATION: "Topics in multi-dimensional diffusions: attainability, reflection, ergodicity and rankings"

University of Tokyo, Tokyo. M.A. Economics, March 2003. B.A. Economics, March 2001.

Professional Appointments

University of California Santa Barbara:

Postdoctoral Researcher, 2009 - 2011;

Visiting Assistant Professor, 2011 - 2012;

Assistant Professor, 2012 - 2017;

Associate Professor, 2017 - 2022;

Professor, 2022 - Present.

Research Fields

Probability Theory and Stochastic Processes

Multi-dimensional reflected diffusions. Elliptic partial differential equations. Bessel processes. Path properties. Local times. Stochastic Partial Differential Equations. Stochastic Differential Games. Diffusions with rank-dependent characteristics. Stochastic McKean-Vlasov equations. Fractional Brownian motions. Rough Paths. Signature.

Mathematical Economics and Finance

Stochastic Portfolio Theory. Atlas models of equity market. Portfolio optimization. Portfolios with information delays. Long-range behavior. Systemic risk analysis.

Statistics and Data Science

Time Series analysis. Molecular evolution. Sports statistics. Actuarial Statistics. Deep Learning in Finance. Directed Chain Generative Adversarial Network.

Teaching Experience

University of California, Santa Barbara (UCSB)

Undergraduate-level: Transition to Data Science, Probability and Statistics, Spring 2022, Winter 2023. Actuarial Mathematics (life contingency), Winter-Spring 2010; Probability & Statistics A, Summer 2010; Mathematics of Fixed Income Market, Fall 2010 - 2011, Summer 2012, Winter 2021; Probability & Statistics B, Winter 2011; Introduction to Financial Mathematics 2012-2015, Fall 2018, Fall 2019, Fall 2020; Stochastic Processes A-B, Fall 2015, Winter 2016, Spring 2016, Fall 2016, Winter 2017, Winter 2018; Risk Theory, Winter 2012; Time Series Winter-Spring 2023, Spring 2024, Winter 2025. Advanced Mathematical Finance Spring 2024; Undergraduate Independent Research 2012 - 2024; Online Actuarial Tutorial 2015 - 2016; Internship in Stats, Fall 2012, Fall 2015, Winter 2016, Winter 2017; CCS Mathematics Probability Spring 2014-2018;

Graduate-level: Measure Theory for Probability Fall 2021, Fall 2022. Introduction to Probability and Stochastic Processes Fall 2018 - Spring 2019, Winter 2020, Spring 2020, Fall 2020, Winter 2024, Spring 2024, Fall 2024. Financial Modeling, Winter 2013 - 2014, Spring 2013, Winter 2015. Advanced Topics in Financial Mathematics, Spring 2023. Directed Reading and Research, Fall 2012 - 2013, Winter 2014, Fall 2014, 2015 - 2024. Research Seminar Probability and Statistics Fall 2013 - Spring 2017.

PhD students completed at UCSB

Mostafa (Stef) Mousavi, Mark Dela, Tianjao (Nicole) Yang, Ming Min, Huiyu Jiang.

Columbia University

Teaching Fellow - Time Series analysis, Summer 2007. Introduction to Statistics without calculus, Summer 2007 & Fall 2008.

Teaching Assistant - Introduction to Statistics without calculus, Time Series Analysis, Stochastic Processes and their Applications, Stochastic Methods in Finance, and PhD-level Analysis and Probability I & II.

Tokyo International University. Lecturer - Calculus, from April 2003 to March 2004.

Research

Preprints/Papers Under Review

"Rank-based stochastic differential inclusions and diffusion limits for a load balancing model" arXiv 2409.15121 with Rami Atar

"A New Compound Poisson Process and Its Fractional Versions" arXiv 2407.18217 with Palaniappan Vellaisamy, 2024

"Invariant measure of gaps in degenerate competing three-particle systems" arXiv:2401.10734 with Sandro Franceschi, Ioannis Karatzas and Killian Raschel, 2024 to appear in *Annales de l'Institut Henri Poincaré.*

"Stochastic Volterra Integral Equations with Ranks as Scaling Limits of Parallel Infinite-Server Queues under Weighted Shortest Queue Policy" with Guodong Pang 2023.

"Relative arbitrage opportunities in an extended mean-field system" arXiv: 2311.02690 with Nicole Tianjiao Yang, 2023.

"Stochastic Analysis of Colliding Brownian Particles" (accepted in Sugaku Exposition, American Mathematical Society), 2023.

"Optimal investment with insider information using Skorokhod and Russo-Vallois integration" arXiv:2211.07471 with Mauricio Elizalde and Carlos Escudero.

"Relative Arbitrage Opportunities in N Investors and Mean-Field Regimes" arXiv:2006.15158 with Tianjiao Yang.

"Large Banking Systems with Default and Recovery: A Mean Field Game Model", arXiv: 2001.10206 with Romuald Élie and Mathieu Laurière.

"Option pricing with delayed information" arXiv: 1707.01600 with Seyyed Mostafa Mousavi.

"Large deviations for interacting Bessel-like processes and applications to systemic risk" arXiv: 1303.3061 with Mykhaylo Shkolnikov.

Published Papers

"Semimartingale properties of a generalized fractional Brownian motion and its mixtures with applications in asset pricing" *Finance and Stochastics* arXiv:2012.00975 with Guodong Pang and Murad S. Taqqu, 2025.

"Smoothness of directed chain stochastic differential equations" *Electronic Journal of Probability* **29** 1-28. arXiv:2202.09354 with Ming Min, 2024.

"Catalan Numbers, Riccati Equations and Convergence" *European Journal of Applied Science* **12**(4). 407-418. arXiv: 2408.09079 with Yicheng Feng and Jean-Pierre Fouque, 2024

"Systemic Risk Models for Disjoint and Overlapping Groups with Equilibrium Strategies" *Statistics and Risk Modeling* **40** 1-2, 2023, pp. 21–51. DOI: 10.1515/strm-2022-0004 arXiv:2202.00662 with Yichen Feng, Jean-Pierre Fouque and Ruimeng Hu.

"Degenerate Competing Three-Particle Systems" *Bernoulli Journal* (2022) **28**(3) 2067–2094, DOI: 10.3150/21-BEJ1411 arXiv:2006.04970 with Ioannis Karatzas.

"Convolutional Signature for Sequential Data" *Digital Finance* (2022) DOI: 10.1007/s42521-022-00049-7 arXiv:2009.06719 with Ming Min.

"Linear-Quadratic Stochastic Differential Games on Random Directed Networks" *Journal of Mathematics and Statistical Science* (2021) Vol. **7** 79–108, arXiv:2011.04279 with Yichen Feng and Jean-Pierre Fouque.

"Linear-Quadratic Stochastic Differential Games on Directed Chain Networks" *Journal of Mathematics and Statistical Science* (2021) Vol. **7** 25–67, arXiv: 2003.08840 with Yichen Feng and Jean-Pierre Fouque.

"Path properties of a generalized fractional Brownian motion" *Journal of Theoretical Probability* (2021) Vol. **35**, 550-574, arXiv:2009.07788 with Guodong Pang and Murad S. Taqqu.

"Directed Chain Stochastic Differential Equations" *Stochastic Processes and their Applications* (2020) Vol. **130** 2519–2551, arXiv: 1805.01962 with Nils Detering and Jean-Pierre Fouque.

"Dynamic Contagion in a Banking System with Births and Defaults" *Annals of Finance* (2019) Vol. **15**, 489-538, arXiv: 1807.09897 with Michael Ludkovski and Andrey Sarantsev.

"Convergence and stationary distribution for Walsh diffusions" *Bernoulli* (2019) Vol. **25**, No. 4A, 2439-2478, arXiv: 1706.07127 with Andrey Sarantsev.

"Stochastic Integral Equations for Walsh semimartingales" *Annales de l'Institut Henri Poincaré* (2018) Vol. **54**, No. 2, 726-756, arXiv: 1505.02504 (with Ioannis Karatzas, Vilmos Prokaj and Minghan Yan).

"Yet another condition for absence of collisions for competing Brownian particles" *Electronic Communications in Probability* (2017) Volume **22**, no. 8, 7 pp. arXiv:1608.07220 (with Andrey Sarantsev).

"Skew-unfolding the Skorokhod reflection of a continuous semimartingale" *Stochastic Analysis and Applications 2014* (2014) arXiv: 1404.4662 (with Ioannis Karatzas).

"Stability in a system of interbank lending" *SIAM Journal of Financial Mathematics* (2013) Volume **4**, 784-803 (with Jean-Pierre Fouque).

"Diffusions with rank-based characteristics and values in the nonnegative quadrant" *Bernoulli* (2013) Volume **19**, No. 5B, 2455-2493 (with Ioannis Karatzas and Vilmos Prokaj). arXiv:1202.0036.

"A second-order stock market model" *Annals of Finance*, Volume **9** (2013) 439-454 (with E. Robert Fernholz and Ioannis Karatzas). arXiv:1302.3870.

"Strong solutions of stochastic equations with rank-based coefficients" *Probability Theory and Related Fields*, Volume **156** (2013) 229-248 (with Ioannnis Karatzas and Mykhaylo Shkolnikov). arXiv:1109.3823.

"Planar diffusions with rank-based characteristics and perturbed Tanaka equations" *Probability Theory and Related Fields*, Volume **156** (2013) 343-374 (with E.Robert Fernholz, Vilmos Prokaj and Ioannis Karatzas). arXiv:1108.3992.

"Convergence rates for rank-based models with applications to portfolio theory" to appear in *Probability Theory and Related Fields*, Volume **156** (2013) 415-448 (with Soumik Pal and Mykhaylo Shkolnikov). arXiv:1108.0384 .

"Two Brownian particles with rank-based characteristics and skew-elastic collisions" *Stochastic Processes and Their Applications*, Volume **123** (2013) 2999-3026 (with E. Robert Fernholz and Ioannis Karatzas). arXiv:1206.4350

"Efficient estimation of one-dimensional diffusion first passage time densities via Monte Carlo simulation" *Journal of Applied Probability* Volume **48**, Number 3 (2011) 699-712 (with Constantinos Kardaras). arXiv:1008.1326.

"Hybrid Atlas models." *Annals of Applied Probability* Volume **22**, 2 (2011), 609-644. (with Ioannis Karatzas, Adrian Banner, Vassillios Papathanakos and E. Robert Fernholz). arXiv:0909.0065.

"On collisions of Brownian particles." *Annals of Applied Probability* Volume **20**, Number 3 (2010), 951-977 (with Ioannis Karatzas). arXiv:0810.2149v2.

"Estimating the effect of the red card in soccer: when to commit an offense in exchange for preventing a goal opportunity." *Journal of Quantitative Analysis in Sports* Volume **5**, No. 1 / 2009 (with Jan Vecer and Frantisek Kopriva).

"Assessing substitution variation across sites in grass chloroplast DNA." *Journal of Molecular Evolution* Volume **64**, No. 6 pp. 605-613 / June, 2007 (with Tian Zheng and Brian Morton) .

"On probabilistic excitement of sports games." *Journal of Quantitative Analysis in Sports* Volume **3**, No. 6 / 2007 (with Jan Vecer and Mladen Laudanovic).

"Multi-period statistical risk management methods and equity-linked life insurance." *Journal of the Japan Statistical Society. Japanese issue* Volume **35**, No. 2 pp. 103-123. / 2006. (with Naoto Kunitomo).

Conference Proceedings

"Directed Chain Generative Adversarial Network" arXiv:2304.13131 with Ruimeng Hu and Ming Min, Proceeding of the 40th International Conference on Machine Learning (ICML'23 July 2023) Pages 24812–24830, September 2023.

"Smoothness of directed chain stochastic differential equations and its applications" at Probability Symposium Dec. 2022, published in RIMS *Kokyuroku*, **2246** 53–60, Kyoto University, Kyoto, 2023.

" Portfolio comparisons under an abstract equity market with transitory volatility" at International Conference on Mathematical Finance and Economics. Istanbul, Turkey, July, 2011.

"Rank based diffusions with skew-elastic collisions" at Probability Symposium Dec. 2013, published in RIMS *Kokyuroku*, Kyoto University, Kyoto, 2014.

"Folding and skew-unfolding of one-dimensional continuous semimartingales." at Probability Symposium Dec. 2014, published in RIMS *Kokyuroku*, Kyoto University, Kyoto, 2015.

"On mean-field approximation of particle systems with annihilation and spikes" at Probability Symposium Dec. 2016, published in RIMS *Kokyuroku*, Kyoto University, Kyoto, 2017.

"Stochastic analysis for collision of Brownian particles" March 2017 The Mathematical Society of Japan.

Research Projects in Progress

"Financial markets with discontinuities"

"Degenerate competing three-particle systems"

"Branching Brownian martingales."

"G-expectation and local times"

"Stochastic analyses in Mathematical Biology"

"Large scale interactions in Financial Markets"

Invited Talks and Presentations

Workshop/Conference Presentations

• Stochastic processes and their applications in Finance, Kyoto, Mar. 2008. • The Third Western Conference in Mathematical Finance, Santa Barbara, Nov. 2009. • The Fourth Probability Conference for Graduate Students and Postdocs, Duke University, May 2010. • Stochastic processes and their applications, Osaka, Sep., 2010. • SIAM Mathematical Finance, San Francisco, Nov. 2010. • Stochastic Analysis in Financial Mathematics and Insurance, University of Michigan, May 2011. • The fourth Western Conference in Mathematical Finance, University of Southern California, June 2011. • International Conference of Financial Mathematics and Economics, Istanbul, July 2011. • Southern California Probability Symposium, University of Southern California, Dec. 2011. • CREST and 4th Florence-Ritsumeikan conference on risk, simulation and related topics, Beppu, Japan, Mar. 2012. • FPS 2012: Workshop on Probability and Statistics in Finance, University of California, Berkeley, May, 2012. • SIAM Conference on Financial Mathematics & Engineering, Minneapolis, Minnesota, July 2012. • CSFI Workshop on Mathematical Finance and Related Issues, Kyoto, Japan, Sep. 2012. • INFORMS, Phoenix, Oct. 2012. • AMS-MAA Joint Mathematics Meetings, San Diego, Jan. 2013. • The Fifth Western Conference on Mathematical Finance, Stanford University, May 2013. • Conference on Stochastic Processes and their Applications, University of Colorado, Boulder, July 2013. • MAA MathFest, Hartford, Connecticut, August 2013. • Probability Symposium, Research Institute for Mathematical Sciences, Kyoto University, December 2013. • AMS-MAA Joint Mathematics Meeting, Baltimore, Jan. 2014. • AMS Eastern section meeting, Baltimore, March 2014. • Banff International Research Station Mathematical Finance: Arbitrage and Portfolio Optimization (14w5116), May 2014. • ASC-IMS Annual Meeting, Sydney, Australia, July 2014. • The Sixth Western Conference on Mathematical Finance, University of California, Santa Barbara, Sep. 2014. • INFORMS, San Francisco, Nov. 2014. • The Stevanovich Center for Financial Mathematics: Trading and Portfolio Theory, University of Chicago, Nov. 2014. • SIAM Conference on Financial Mathematics & Engineering, Chicago, Nov. 2014. • Probability Symposium, Research Institute for Mathematical Sciences, Kyoto University, December 2014. • Conference for Stochastic Portfolio Theory 2015, Columbia University, May 2015. • Conference on Stochastic Processes and their Applications, Oxford, July 2015. • The Seventh Western Conference on Mathematical Finance, University of Texas Austin, Oct. 2015. • Probability Symposium, Okayama University, Japan, Dec. 2015 • AMS-MAA Joint Mathematics Meetings, Seattle, Jan. 2016. • AMS Mathematics Meeting, University of North Dakota April 2016. • Bachelier Finance Society World Congress, New York, July 2016. • Workshop on Stochastic Control and Financial Applications The Hong Kong Polytechnic University, August 2016. • Probability Symposium, Research Institute for Mathematical Sciences, Kyoto University, December 2016. • Workshop on Risk and Recurrent Events. University of Tokyo, December 2016. • The Spring Meeting Mathematical Society of Japan, Tokyo. • Midwest mini conference on Stochastic Processes and Mathematical Finance, North Dakota State University, April 2017. • Thera Stochastic, Santorini, Greece, May 2017. • Workshop on BSDEs and SPDEs, University of Edinburgh, Scotland, July 2017. • INFORMS Applied Probability Society meeting, Northwestern University, July 2017. • INFORMS Annual Meeting, Houston, October 2017. • 11th International Conference on Computational and Financial Economics, University of London, UK • Stochastic Analysis and Applications BIRS Oaxaca Mexico May 2018. • A Symposium on Optimal Stopping, Rice University, June 2018. • 10th World Congress of Bachelier Financial Society, Trinity College, Ireland, July 2018. • Econometrics Data Science Camp, Shinshu University, Japan, August 2018. • Michigan State Symposium on Mathematical Statistics and Applications, Michigan State University, September 2018. • 12th International Conference on Computational and Financial Economics, University of Pisa, Italy December 2018. • SIAM Conference on Financial Mathematics & Engineering, University of Toronto, Canada, June 2019. • INFORMS Annual meeting, Seattle WA, October 2019. • AMS sectional

meeting at University of California Riverside, CA, November 2019. • Probability Symposium, Keio University, Japan, December 2019. • Virtual Workshop on Financial Mathematics and Stochastic Analysis, Madrid, Spain, June 2020. • Bernoulli-IMS One World Symposium, August 2020. • The 2nd International Conference on Machine Learning and Intelligent Systems (MLIS 2020), October 2020. • INFORMS Annual meeting Online, October 2020. • AMS and MAA Joint Mathematical Meeting, January 2021. • Bachelier Finance Society One World Seminar, April 2021. • SIAM Financial Mathematics & Engineering, Online, June 2021. • Statistical methods in Finance 2021 (StatFin), Online, June 2021. • SIAM Annual Meeting July 2021. • AMS Western section meeting Oct. 2021. • The 11th World Congress of Bachelier Finance Society, June 2022. • New Interfaces of Stochastic Analysis and Rough Paths (22w5116) at Banff International Research Station for Mathematical Innovation and Discovery (BIRS), Sep. 2022. • Janet and Ian Duncan Chair Research Day at University of California Santa Barbara in Sep. 2022. • Probability symposium at Research Institute of Mathematical Science (RIMS), Kyoto University in Dec. 2022. • Joint Mathematical Meeting, Boston, Jan. 2023. • Reflected Brownian motion and related topics at Centre Henri Lebesgue Centre de Mathemaques, Angers Roscoff, France, April 2023. • Chicago Conference on Stochastic Analysis and Financial Mathematics (Chicago SAFM) at Illinois Institute of Technology, May 2023. • Society of Industrial and Applied Mathematics (SIAM) Financial Mathematics and Engineering (FM 23), Philadelphia, June 2023. • JAFEE-ISM International Symposium on Quantitative Finance, Tokyo Japan, August 2023. Japanese Association of Financial Economics and Engineering (JAFEE) and Institute of Statistical Mathematics (ISM). • International Congress on Industrial & Applied Mathematics (ICIAM), August 2023. • Stochastics around Finance, Kanazawa, August 2023. • INFORMS Annual Meeting, Phoenix, Arizona, October 2023. • Stochastic Reflection at Isaac Newton Institute for Mathematical Science, August 2024.

Seminar Presentations

• Boston University, Feb. 2008, Jan. 2012. • Carnegie Mellon University, Nov. 2012. • Columbia University, Oct. 2013. • Keio University, Japan, June 2014, June 2018, July 2019. • Kwansai University, Japan, Dec. 2014. • Kyushu University, Dec. 2015, June 2022. • National Chiao Tung University, Taiwan, Nov. 2012. • Pennsylvania State University, Oct. 2020. • Quantitative Products Laboratory in Berlin, Oct. 2008. • Ritsumeikan University, Japan, June 2019, June 2022. • Rutgers, The State University of New Jersey, Jan. 2014. • Tokyo Institute of Technology, Japan, March 2017. • Tokyo Probability Seminar at Keio University, Japan, July 2019, July 2022. • University of California Berkeley, October 2021. • University of California Davis, Sep. 2015. • University of California, Santa Barbara, Oct. 2009, Oct. 2010, Jan. 2012. • University of Michigan, Jan. 2009, Oct. 2011. • University of Minnesota, April 2014. • University of Southern California, March 2015, March 2017, April 2024. • Yokohama National University, Japan, Sep. 2012. • University of Tokyo, Dec. 2007, Sep. 2012, July 2014, Dec. 2015.

Poster Presentation

• Probability, Control and Finance: A Conference in Honor of Ioannis Karatzas, Columbia University, June 2012. • IMA Special Workshop Reflected Brownian Motions, Stochastic Networks, and their Applications June, 2015. • Seminar on Stochastic Processes, May 2018. • Symposium on Probability and Statistics, Michigan State University Lansing, September 2019. • Seminar on Stochastic Processes, Lehigh University, March 2022.

Mini Courses and Visiting Positions

• Osaka University, Japan, Sep. 2012. • National Chiao Tang University, Taiwan, Nov. 2012. • Université Paris Dauphine, Paris, July, 2015. • Kyoto University, Japan, Sep. 2016. • Isaac

Newton Institute for Mathematical Science, Cambridge University, United Kingdom, July - Sep. 2024.

Professional Activities

Editorial Service

• Associate Editor (2018 -) *Stochastics, An International Journal of Probability and Stochastic Processes*, Taylor & Francis, Informa.

• Associate Editor (2020 -) *SIAM Financial Mathematics and Engineering*, Society for Industrial and Applied Mathematics.

• Associate Editor (2020 -) *Methodology and Computing in Applied Probability*, Springer.

• Associate Editor (2021 -) *Applied Stochastic Models in Business and Industry*, Wiley.

• Associate Editor (2023 -) *Stochastic Models*, Taylor & Francis.

Refereeing

• *Annals of Probability.* • *Annals of Applied Probability.* • *Annals of Finance.* • *Annales de l'Institut Henri Poincaré (B) Probabilités and Statistiques.* • *Applied Probability Journal.* • *Electronic Communications in Probability.* • *Electronic Journal of Probability.* • *Entropy.* • *European Journal of Applied Mathematics.* • *Finance and Stochastics.* • *Journal of Computational and Applied Mathematics.* • *Journal of Differential Equations.* • *Journal of Mathematical Physics.* • *Mathematical Reviews.* • *Mathematics of Operations Research* • *Operations Research Letters.* • *Physica A.* • *Probability Theory and Related Fields.* • *Quantitative Finance.* • *Statistics and Probability Letters.* • *Stochastic Processes and their Applications.* • Stochastics • *Stochastic Models.* • *SIAM Journal of Financial Mathematics.* • *Systems & Control Letters.*

• *Journal of American Statistical Association.* • *Journal of Quantitative Analysis in Sports.* • *Computational Statistics and Data Analysis.* • Applied Stochastic Models in Business and Industry • *International Journal of Geometric Methods in Modern Physics.* • *PLOS ONE.* • *Journal of Systems Science and Systems Engineering.* • *Springer Nature in Applied Science.* • *Mathematical Biosciences and Engineering.*

Organizing Conferences

• MAA Math Fest, Hartford, CT Aug. 2013 (Invited Paper Session "Recent Developments in Mathematical Finance" session organizer)

• Actuarial Research Conference, Santa Barbara. CA July 2014 (local organizer)

• Western Conference in Mathematical Finance, Santa Barbara, CA Sep. 2014 (local organizer).

• Mini symposium on Stochastic Portfolio Theory in SIAM FM 2016 (mini symposium co-organizer).

• Southern California Probability Symposium University of Southern California December 2018.

• Mini symposium on mean-field in financial models in SIAM FM 2019 at University of Toronto (mini symposium co-organizer).

• Co-organizer for "Virtual workshop on financial mathematics and stochastic analysis" at Instituto de Ciencias Matematicas (ICMAT), Madrid, Spain, June 2020.

• Mini symposia (on Recent Advances in Stochastic Portfolio Theory I-II, and on Mean-field Games in Mathematical Finance), SIAM Annual Meeting, Pittsburg, Pennsylvania, July 2022.

• CFMAR Workshop 2022 at University of California Santa Barbara, Sep. 2022.

• Organizing Committee, SIAM FM 23, Philadelphia, June 2023.

• Mini symposium on Stochastic Portfolio Theory, SIAM FM 23, Philadelphia, June 2023.

• Mini symposium on recent advancement in mathematical finance, International Congress on Industrial and Applied Mathematics, Tokyo, Japan, August 2023.

• Invited Paper Session on Mean-field Games and Games on Network, the Bernoulli-IMS 11th World Congress in Probability and Statistics, Bochum, Germany, August 2024.

Other responsibilities

• Secretary for Society of Industrial and Applied Mathematics (SIAM) Activity Group Financial Mathematics and Engineering 2022-2023.

Honors & Awards

• *National Science Foundation Award*, NSF DMS-2008427, "Large scale interactions in financial markets" July 2020 - June 2024.

• *National Science Foundation Award*, NSF DMS-1615229, "Information and Stochastic Differential Equations in Financial Markets" July 2016 - June 2020.

• *National Science Foundation Award*, NSF DMS-1313373, "Financial markets with discontinuities" Sep. 2013 - Aug. 2016.

• *Best oral presentation*, The 2nd International Conference on Machine Learning and Intelligence Systems (MLIS 2020), Oct. 2020.

• *SIAM SIAG/FME Junior Scientist Prize*, Society Industrial and Applied Mathematics (SIAM), Nov. 2014.

• *Postdoc/Early Career Travel Award*, Society Industrial and Applied Mathematics (SIAM), Nov. 2010.
• *Faculty Fellowship*, Columbia University, Sep. 2004 - May 2009.
• *Special Award of Excellence*, Department of Economics, University of Tokyo, 2001.

Departmental Service

Online course, 2011-2016. *Statistics Seminar*, 2012-2017. *Library*, 2012-2015. *Computer*, 2012-2015. *Probability Qualifying exam*, 2012-2015, 2018-2021 (chair in 2018-2019), 2024. *Graduate advisor*, 2014-2018. *Graduate Program Director* 2017-2018. *Graduate Admission* 2018-2020 (chair in 2019-2020). *co-Director of Undergraduate Program* 2020-2021. *Department Vice Chair* 2021-2022. *Department Chair* 2022-2025.

Campus Committee

Committee on International Education 2016-2019. Academic senate committee for career development award and regents fellowships 2021. Academic senate committee on faculty grants 2021. UCSB Reads in 2023, 2024.

Miscellaneous

Computer Skills C, C++, FORTRAN, Matlab, Mathematica, Python, R.
Language Skills Fluency in Japanese. Reading in French and Russian articles.

References

Ioannins Karatzas
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