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Research Interests

Mathematical Statistics	(1) Bootstrap method for time series data (2) Statistic analysis on infinite variance data (3) High-dimensional model selection problem (4) Quantile regression
Time Series	(1) Optimal prediction problem of stationary processes (2) Robust methods for frequency domain in time series analysis (3) Extremogram and quantile-based statistical inference (4) Estimation of the tail index of heavy-tailed processes (5) Nonregular method for estimation of time series
Financial Engineering	(1) Optimal portfolio for large-scale funding (2) Optimal portfolio under the multi-period model

Position

2017 —	**Assistant Professor at Kyoto University**
2017 — 2017	Assistant Professor at Waseda University
2016 — 2017	Research Associate at Waseda University
2015 — 2016	JSPS Research Fellowship for Young Scientists (PD)
2014 — 2015	JSPS Research Fellowship for Young Scientists (DC2)

Education

2015 — 2016	Postdoctoral at Waseda University, Tokyo
2013 — 2015	Ph.D., Mathematical Statistics, Waseda University, Tokyo Thesis: Asymptotic Theory for Non-standard Estimating Function and Self-normalized Method in Time Series Analysis Supervisor: Dr. Masanobu Taniguchi Advisor: Dr. Takeru Suzuki, Dr. Ritei Shibata, Dr. Yasutaka Shimizu
2011 — 2013	Master of Science, Mathematical Statistics, Waseda University, Tokyo Thesis: Nonparametric Methods in Time Series Analysis Supervisor: Dr. Masanobu Taniguchi
2008 — 2011	Bachelor of Science, Applied Mathematics, Waseda University, Tokyo

Grants and Fellowships

2018	Grant-in-Aid for Young Scientists (17K12652), "Theoretical development on bootstrap method and empirical likelihood method on temporal and spatial data", ¥1430,000 (Direct cost: ¥1100,000)
2017	Grant-in-Aid for Young Scientists (17K12652), "Theoretical development on bootstrap method and empirical likelihood method on temporal and spatial data", ¥650,000 (Direct cost: ¥500,000)
2017	Waseda University (2017K-182), "Research on construction of asymptotic theory and new method for time series data with missing observations", ¥192,000
2016	Waseda University (2016B-125), "Research on time series analysis by quantile regression and its application", ¥480,000
2016	Waseda University (2016S-063), "Research on time series analysis by quantile regression and its application", ¥180,000
2015	JSPS (26·7404), "Research on the robust statistics applied to the time series models with infinite variance", ¥1170,000 (Direct cost: ¥900,000)
2014	JSPS (26·7404), "Research on the robust statistics applied to the time series models with infinite variance", ¥1,000,000
2013	Early Bird Program Fellowships (13E15), "On the properties of tail index estimators by self-normalized method", ¥700,000

Teaching Experience

2018	Seminar on Applied Mathematics and Physics, Kyoto University
2018	System Analysis Laboratory, Kyoto University
2018	Systems Science, Advanced I (Graduate School of Informatics), Kyoto University
2017	Mathematics A2 (Linear Algebra), Waseda University
2017	Basic Experiments in Science and Engineering 1B I, Waseda University
2017	Basic Experiments in Science and Engineering 1A IV, Waseda University
2016	Mathematics Q&A, Waseda University
2011 — 2015	Teaching Assistant as a Mathematics Tutor in school of FSE, Waseda University
2012 — 2014	Teaching Assistant as a Statistics Tutor in school of ILS, Waseda University
2010 — 2013	Teaching Assistant as a English Tutor in school of CSE, Waseda University

Languages

Chinese	Mother tongue
Japanese	**Bilingual**
English	**Fluent**
French	Some knowledge
German	Some knowledge
Italian	Some knowledge

Memberships

2015 —	Japan Statistical Society
2012 —	Mathematical Society of Japan
2013 — 2014	Early Bird Program, Waseda University

Publications

BOOK

2018 — **Liu**, Akashi and Taniguchi,
Empirical Likelihood and Quantile Methods for Time Series, Springer.

PAPERS

2018 — Akashi, Dette and **Liu**, "Change-point detection in autoregressive models with no moment assumptions", *Journal of Time Series Analysis*, **39**(5), 763-786.

2018 — **Liu**, Tamura and Taniguchi, "Asymptotic theory of test statistic for sphericity of high-dimensional time series", *Journal of Time Series Analysis*, **39**(3), 402-416.

2017 — **Liu**, "Statistical inference for quantiles in the frequency domain", *Statistical Inference for Stochastic Processes*, **20**(3), 369-386.

2017 — **Liu**, Nagahata, Uchiyama and Taniguchi, "Discriminant and cluster analysis of possibly high-dimensional time series data by a class of disparities", *Communications in Statistics - Simulation and Computation*, **46**(10), 8014-8027.

2017 — **Liu**, "Robust parameter estimation for stationary processes by an exotic disparity from prediction problem", *Statistics & Probability Letters*, **129**, 120-130.

2016 — **Liu**, "Optimal portfolio of the Government Pension Investment Fund based on the systemic risk evaluated by a new asymmetric copula", *Advances in Science, Technology and Environmentology*, **B13**, 19-33.

2016 — Suto, **Liu** and Taniguchi, "Asymptotic theory of parameter estimation by a contrast function based on interpolation error", *Statistical Inference for Stochastic Processes*, **19**(1), 93-110.

2015 — Akashi, **Liu** and Taniguchi, "An empirical likelihood approach for symmetric α-stable processes", *Bernoulli*, **21**(4), 2093-2119.

2015 — **Liu**, "Variance stabilizing properties of Box-Cox transformation for dependent observations", *Advances in Science, Technology and Environmentology*, **B12**, 63-70.

2014 — **Liu**, "Asymptotics for M-estimators in time series", *Advances in Science, Technology and Environmentology*, **B10**, 55-67.

2013 — **Liu**, "Asymptotic moments of symmetric self-normalized sums", *Scientiae Mathematicae Japonicae*, **77**(1), 59-67.

Presentations

Oct 2018 — **Liu**, "A new perspective of parameter estimation of stationary time series", Nanzan International Symposium, Nanzan University

Oct 2018 — Dunsmuir and ***Liu**, "A test for missingness in time series", Waseda International Symposium, Waseda University

Sept 2018 — **Liu**, "From prediction and interpolation problem to parameter estimation problem of time series", The Mathematical Society, Okayama University, URL: `https://app.mathsoc.jp/meeting_data/okayama18sept/index-08.html`

Sept 2018 — ***Liu**, Tamura and Taniguchi, "Sphericity test for high-dimensional time series", Japanese Joint Statistical Meeting, Chuo University

Sept 2018 — ***Liu**, Tamura and Taniguchi, "Sphericity test for high-dimensional time series", Mathematical Statistics and Stochastic Analysis for Modeling and Analysis of Complex Random Systems V, Osaka University

Mar 2018 — *Akashi, Dette and **Liu**, "Robust GEL Test in Infinite Variance Processes and its Application to Change Point Tests", Kagawa International Symposium, Kagawa University

Oct 2017 **Liu**, "Robust parameter estimation for irregularly observed stationary process", Kyoto International Seminar, Kyoto Terrsa

Oct 2017 **Liu**, Tamura and Taniguchi, "Asymptotics of test statistic for sphericity of high-dimensional time series without diagonalizability condition", Waseda International Symposium, Waseda University

Oct 2017 *Akashi, Dette and **Liu**, "Self-weighted GEL methods for linear hypothesis in infinite variance processes and its application to change point tests", Waseda International Symposium, Waseda University

Sept 2017 **Liu**, *Nagahata, Uchiyama and Taniguchi, "Discriminant and cluster analysis of possibly high-dimensional time series data by a class of disparities", University of Malaya, Malaysia

Sept 2017 **Liu**, "A test for stationary by copula spectral density", The Mathematical Society of Japan, Yamagata University

Sept 2017 ***Liu**, Nagahata and Taniguchi, "Linear discriminant analysis for high-dimensional time series", Japan Statistical Society, Nanzan University

Jun 2017 **Liu**, *Xue and Taniguchi, "Robust interpolation problem in L^p", Hong Kong University of Science and Technology, Hong Kong

May 2017 *Akashi, Dette and **Liu**, "Change Point detection by self-weighted empirical likelihood method and its application to real data", National Tsing Hua University, Taiwan

Apr 2017 (Poster) *Nagahata, **Liu**, Uchiyama and Taniguchi, "Discriminant and cluster analysis of possibly high-dimensional time series data by a class of disparities", WIRP workshop, Waseda University, **[The excellence award]**

Mar 2017 *Nagahata, **Liu**, Uchiyama and Taniguchi, "Discriminant and cluster analysis of possibly high-dimensional time series data by a class of disparities", Sun Yat-sen University, Taiwan

Mar 2017 ***Liu**, Chen, Chan and Taniguchi, "A frequency domain bootstrap for irregularly spaced spatial data", The Mathematical Society of Japan, Tokyo Metropolitan University

Mar 2017 **Liu**, "Statistical inference for quantiles in frequency domain", Keio International Symposium, Keio University

Mar 2017 ***Liu**, Chen, Chan and Taniguchi, "A frequency domain bootstrap for irregularly spaced spatial data", Ise-Shima International Seminar, Ise-Shima

Feb 2017 **Liu**, "Robust parameter estimation for irregularly observed stationary process", Waseda International Symposium, Waseda University

Oct 2016 **Liu**, "Statistical inference for quantiles in frequency domain", Hokkaido International Symposium, Hokkaido University

Oct 2016 ***Liu**, Chen, Chan and Taniguchi, "A frequency domain bootstrap for irregularly spaced spatial data", Waseda International Symposium, Waseda

Oct 2016 *Xue, **Liu** and Taniguchi, "Robust interpolation problems in L_p", Waseda International Symposium, Waseda

Sept 2016 **Liu**, "Quantile tests in frequency domain for sinusoid models", The Mathematical Society of Japan, Kansai University

Sept 2016 *Xue, **Liu** and Taniguchi, "Robust interpolation problems in L_p", The Mathematical Society of Japan, Kansai Univeristy

Sept 2016 **Liu**, "Robust statistical analysis on irregular time series data and its asymptotic theory", Japan Statistical Society, Kanazawa University

Jul 2016 **Liu**, "Statistical theory for quantiles in frequency domain", Research Seminar on Statistics and Financial Mathematics, Waseda University

Mar 2016 *Xue, **Liu** and Taniguchi, "Minimax extrapolation error of predictors", The Mathematical Society of Japan, Tsukuba

Mar 2016 **Liu**, "Box-Cox transformation for variance stabilization of dependent observations",The Mathematical Society of Japan, Tsukuba

Mar 2016 **Liu**, "Box-Cox transformation and variance stabilization", Ibusuki International Seminar, Ibusuki

Mar 2016 **Liu**, "Robust parameter estimation for irregularly observed stationary process", Kumamoto International Symposium, Kumamoto University

Mar 2016	*Liu, Xue and Taniguchi, "Minimax extrapolation error of stationary processes", Waseda International Symposium, Waseda University
Nov 2015	**Liu**, "Variance stabilization and robust permutation tests", Hakone Seminar, Hakone
Nov 2015	*Nagahata, **Liu**, Uchiyama and Taniguchi, "Discriminant and cluster analysis of high-dimensional time series data", Hakone Seminar, Hakone
Nov 2015	***Liu**, Xue and Taniguchi, "Minimax extrapolation error of predictors", Waseda International Symposium, Waseda University
Sept 2015	*Nagahata, **Liu**, Uchiyama and Taniguchi, "Discriminant and cluster analysis of high-dimensional time series data", The Mathematical Society of Japan, Kyoto Sangyo University
Jun 2015	*Nagahata, **Liu**, Uchiyama and Taniguchi, "Discriminant and cluster analysis of high-dimensional time series data by a class of disparities", Project Research Seminar on Financial and Pension Mathematics, Waseda University
Mar 2015	**Liu**, "Asymptotic Theory for Minimum Contrast Estimation in Time Series Analysis", The Mathematical Society of Japan, Meiji University
Mar 2015	**Liu**, "A new class of minimum contrast estimators for parameter estimation in time series", Miura Statistical Seminar, Miura
Mar 2015	**Liu**, "Empirical likelihood methods for quantile regression with long range dependent errors", Waseda International Symposium, Waseda University
Feb 2015	**Liu**, "Prediction error or interpolation error? A general perspective of parameter estimation in time series analysis", Technische Universität München, Munich
Jan 2015	**Liu**, "Statistical Inference for Stable Process", Izu Seminar, Izu
Oct 2014	**Liu**, "Minimum Contrast Estimation for Spectral Densities Based on Exotic Disparity", Kaken Symposium, Niigata University
Sept 2014	**Liu**, "Quantile Estimation in Frequency Domain", The Mathematical Society of Japan, Hiroshima University
Sept 2014	*Suto, **Liu** and Taniguchi, "Parameter Estimation by a Contrast Function Based on Interpolation Error", The Mathematical Society of Japan, Hiroshima University
Sept 2014	**Liu**, "Robust Estimation of Frequencies", Kaken Symposium, Nara University of Education
Sept 2014	*Suto, **Liu** and Taniguchi, "Parameter Estimation by a Contrast Function of Interpolation Error", Kaken Symposium, Nara University of Education
May 2014	*Suto, **Liu** and Taniguchi, "Asymptotic Theory of Parameter Estimation by a Function Based on Interpolation Error", Project Research Seminar on Financial and Pension Mathematics, Waseda University
Mar 2014	**Liu**, "M-estimation in Time Series and Its Applications", The Mathematical Society of Japan, Gakushuin University
Mar 2014	(Poster) "On the Properties of Tail Index Estimators by Self-normalized Method", Final Results Presentation of Young Researchers, Waseda University
Mar 2014	**Liu**, "Tail Index Estimation by Self-normalized Method", Nishi-Izu Seminar, Nishi-Izu
Mar 2014	*Akashi, **Liu** and Taniguchi, "Empirical Likelihood Ratio for Symmetric Alpha-stable Processes", Waseda International Symposium, Waseda University
Mar 2014	**Liu**, "Generalized Periodogram and Its Statistical Inference for Time Series", Waseda International Symposium, Waseda University
Jan 2014	**Liu**, "Robust Spectral Estimation in Time Series Analysis", High Dimensional Statistical Analysis and Related Topics, Waseda University
Nov 2013	(Poster) "On the Properties of Tail Index Estimators by Self-normalized Method", WINeST Symposium, Waseda University
Nov 2013	**Liu**, "Asymptotics for M-Estimators in Time Series", Workshop in Statistical Applications and Time Series, Kanazawa University
Sept 2013	**Liu**, "A New Way to Estimate Tail Index", The Mathematical Society of Japan, Ehime University
Aug 2013	**Liu**, "The New Class of Estimating Tail Index by Self-normalization", Bird Meeting, Waseda University
May 2013	**Liu**, "Asymptotic Moments of Symmetric Self-normalized Sums", Project Research Seminar on Financial and Pension Mathematics, Waseda University

Mar 2013	***Liu** and Taniguchi, "Hypothesis Testing for Vector Stable Processes", The Mathematical Society of Japan, Kyoto University
Apr 2012	**Liu**, "Introduction to Rank Tests", Seminar of Physics and Mathematics, Waseda University, URL: `http://physmathseminar.web.fc2.com/discourse/discourse-in-Tokyo.html`
Dec 2010	**Liu**, "From Probability Distribution to Black-Scholes Model", Seminar of Physics and Mathematics, Waseda University, URL: `http://physmathseminar.web.fc2.com/discourse/discourse-sokei.html`

Professional Experience

Organizer	Miura Statistical Seminar (Mar. 2015)
Referee	*Journal of the American Statistical Association*; *Journal of Multivariate Analysis*; *Statistic Sinica*; *Electronic Journal of Statistics*; *Journal of Business & Economic Statistics*; *Sankhya A*; *American Journal of Mathematical and Management Sciences*; *Statistical Inference for Stochastic Processes*; *Advances in Science, Technology and Environmentology*; *Scientiae Mathematicae Japonicae*; *Japanese Journal of Statistics and Data Science*; *Communication in Statistics - Simulation and Computation*

Attendance

Nov 2014	From Robust to High-dimensional Statistics: 50 Years of Statistics at ETH Zurich, ETHZ, Switzerland
May 2014	Self-normalized Asymptotic Theory in Probability, Statistics and Econometrics, National University of Singapore, Singapore

Visiting Appointments

2017 Visiting Scholar	Department of Statistics, Chinese University of Hong Kong (Professor Ngai Hang Chan)
2017 Visiting Scholar	School of Mathematics & Statistics, University of New South Wales (Professor William Dunsmuir)
2016 Visiting Scholar	Department of Statistics, Chinese University of Hong Kong (Professor Ngai Hang Chan)
2015 Visiting Scholar	Department of Mathematics, Ruhr-University Bochum (Professor Holger Dette)
2015 Visiting Scholar	Department of Statistics, University of Illinois at Urbana-Champaign (Associate Professor Xiaofeng Shao)
2015 Visiting Scholar	Department of Mathematics, Technical University of Munich (Professor Claudia Klüppelberg)

Other Research Experience

2013 — 2014	Research Assistant for Simulations of Some Warranty Models, Waseda University
2013 — 2014	Research Assistant for Script Writing, Waseda University
2014	Research Assistant for Statistic Analysis of Questionary, Waseda University
2013	Research Assistant for Translation Work on Insurance, The University of Hong Kong
2012	Research Assistant for Statistics of Transfer Pricing, Waseda University

Media

Apr 2015	*Waseda University Admission Brochure 2016*, p.9
Mar 2014	*Waseda Riko Plus 2014*, pp. 68-70