Fumiya Akashi (　　　)

Contact Information

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Positions

Apr. 2019 - present	Assistant Professor
	Faculty of Economics, University of Tokyo
Apr. 2018 - Mar.2019	Assistant Professor
	Research Institute for Science & Engineering, Waseda University
Apr. 2017 - Mar.2018	Assistant Professor
	Department of Applied Mathematics, Waseda University
Apr. 2016 - Mar.2017	Research Associate
	Department of Applied Mathematics, Waseda University
Apr. 2015 - Mar.2016	Research-Fellow PD
	Japan Society for the Promotion of Science
Apr. 2014 - Mar.2015	Research-Fellow DC2
	Japan Society for the Promotion of Science

Education

Mar. 2015	Ph.D. in Science
	Graduate School of Pure and Applied Mathematics, Waseda University
	Advisor: Masanobu Taniguchi
Mar. 2013	M.S. in Science
	Graduate School of Pure and Applied Mathematics, Waseda University
Mar. 2011	B.S. in Engineering
	School of Fundamental Science and Engineering, Waseda University

Grants

- Apr. 2024 - Mar. 2027 Grant-in-Aid for Scientific Research (C), JSPS

  (3,200,000 JPY)

- Apr. 2020 - Mar. 2025 Grant-in-Aid for Early-Career Scientists, JSPS

  (Statistical inference for nonstandard data via time varying processes, robust regression and directional statistics) (3,100,000 JPY)

- Apr. 2016 - Mar. 2020 Grant-in-Aid for Young Scientists (B), JSPS

  (Robust nonparametric inference for infinite variance processes by self-weighted empirical likelihood method) (3,000,000 JPY)

- Apr. 2014 - Mar. 2016 Grant-in-Aid for JSPS Fellows, JSPS

<div align="right">(1,400,000 JPY)</div>

Award

Research Interests

- Time series analysis
- Infinite variance process
- Nonlinear time series
- Robust regression methods
- Tensor-valued distributions

Publications

List of Papers

[A1] Akashi, F. (2023). Spatial Median-Based Smoothed and Self-Weighted GEL Method for Vector Autoregressive Models. In: Liu, Y., Hirukawa, J., Kakizawa, Y. (eds) Research Papers in Statistical Inference for Time Series and Related Models. Springer, Singapore. https://doi.org/10.1007/978-981-99-0803-5_1

[A2] Akashi, F., Taniguchi, M., and Tanida, Y. (2021). Estimation of linear functional of large spectral density matrix and application to Whittle's approach. *Japanese Journal of Statistics and Data Science*, Volume 4, pages 449-474. https://doi.org/10.1007/s42081-021-00120-4

[A3] Akashi, F., Taniguchi, M., and Monti, A.C. (2020). Robust causality test of infinite variance processes. *Journal of Econometrics*, Volume 216, Issue 1, pages 235-245. https://doi.org/10.1016/j.jeconom.2020.01.016

[A4] Akashi, F., Dette, H., and Liu, Y. (2018). Change point detection in autoregressive models with no moment assumptions. *Journal of Time Series Analysis*, Volume 39, Number 5, pages 763-786. https://doi.org/10.1111/jtsa.12405

[A5] Akashi, F., Bai, S., and Taqqu, M.S. (2018). Robust regression on stationary time series: a self-normalized resampling approach. *Journal of Time Series Analysis*, Volume 39, Number 3, pages 417-432. https://doi.org/10.1111/jtsa.12295

[A6] Akashi, F., Odashima, H., Taniguchi, M., and Monti, A.C. (2018). A new look at portmanteau tests. *Sankhya*, Volume 80-A, Part 1, pages 121-137. https://doi.org/10.1007/s13171-017-0109-3

[A7] Akashi, F. (2017). Self-weighted generalized empirical likelihood methods for hypothesis testing in infinite variance ARMA models. *Statistical Inference for Stochastic Processes*, 20(3), pages 291-313. https://doi.org/10.1007/s11203-017-9159-3

[A8] Akashi, F., Liu, Y., and Taniguchi, M. (2015). An empirical likelihood approach for symmetric alpha-stable process. *Bernoulli*, 21(4), pages 2093-2119. https://doi.org/10.3150/14-BEJ636

[A9] Akashi, F. (2014). Empirical likelihood approach toward discriminant analysis for dynamics of stable processes. *Statistical Methodology*, Volume 19, pages 25-43. https://doi.org/10.1016/j.stamet.2014.01.004

[A10] Akashi, F. (2014). An empirical likelihood approach for discriminant analysis of non Gaussian vector stationary linear processes. *Scientiae Mathematicae Japonicae*, Volume 77, Number 2, pages 143-158. https://doi.org/10.32219/isms.77.2_143

List of Books

[B1] Akashi, F., Taniguchi, M., Monti, A.C., and Amano, T. (2021). *Diagnostic Methods in Time Series.* JSS Research Series in Statistics. Springer. https://doi.org/10.1007/978-981-16-2264-9

[B2] Liu, Y., Akashi, F., and Taniguchi, M. (2018). *Empirical Likelihood and Quantile Methods for Time Series.* JSS Research Series in Statistics. Springer. https://doi.org/10.1007/978-981-10-0152-9

Working/Submitted Papers

[1] Robust low-rank regression in VAR models by a spatial median-based empirical likelihood estimator

[2] Self-weighted quasi-maximum exponential likelihood estimators for nonlinear time series models (joint work with Negri, I.)

[3] Asymptotic theory of rank-based estimator for possibly infinite variance autoregressive models

[4] Inference for non-stationary heavy tailed time series (joint work with Fokianos, K. and Hirukawa, J.)

Presentations

Notes: [EN] indicates a talk delivered in English, [JP] in Japanese; "invited" denotes invited talks.

2025

- [EN] Optimal rank estimators for possibly infinite variance autoregressive models (Frontiers in Directional Statistics Theory, Methods, and Applications at Hosei University)

- [EN, invited] Robust LD-based EL estimator for low-rank vector autoregressive models (UC International Data Science Workshop at University of Canberra)

- [EN, invited] Sparse empirical likelihood estimation for Low-rank VAR models (EcoSta 2025 (Organized Session EO134 by Erricos Kontoghiorghes, Ana Colubi) at Waseda University)

- [EN, invited] Convergence of plug-in statistics in spatial median regression and application to sparse empirical likelihood estimation (Shimoda Statistical Seminar, Advances in Quantum Statistics and Time Series Analysis at Shimoda Tokyu Hotel)

2024

- [EN] On weighted plug-in statistics in spatial median regression (International Workshop, Innovations in Statistical Modeling and Inference: Applications Across Various Manifolds at Hosei University)

- [JP] VAR (2024 at)

- [JP] Robust inference for non-stationary heavy-tailed processes via self-weighting and resampling method (Advances in Statistical Modeling and Inference: Exploring Applications on Diverse Manifolds (supported by Japan Statistics Research Institute) at Hosei University. Joint work with Konstantinos Fokianos and Junichi Hirukawa)

2023

- [EN] Robust reduced rank estimation for low-rank vector AR models (TMU International Conference on Statistical Modelling and Inference at Tokyo Metropolitan University (Marunouchi Satellite Campus, Room A))

- [JP] VAR (2023 at)

- [JP, invited] (2023 (37) at)

- [EN, invited] Robust reduced rank estimation for low-rank vector AR models (EcoSta 2023 (Organized Session EO076 by Zudi Lu) at Waseda University)

- [JP, invited] Spatial-median based self-weighted GEL and robust low-rank regression for VAR models (at)

2022

- [JP] Least distance estimation for low-rank VAR models (Waseda mini-workshop "Recent development on time series analysis and related topics" at Waseda University)

- [JP, invited] VAR (at)

- [JP] (2022 at)

- [EN, invited] Weighted estimation procedures for time-varying heavy-tailed processes (EcoSta 2022 (Organized Session EO271 by Zudi Lu) at Ryukoku University. Joint work with Konstantinos Fokianos and Junichi Hirukawa)

- [EN, invited] Spatial median and self-weighted approach for multivariate heavy-tailed processes (Mathematics and Statistics Seminar Series at University of Bergamo (Online seminar, joined from Japan))

- [JP] GEL confidence regions for nonstationary heavy-tailed processes (Otsu Seminar "Recent Developments in Time Series and Related Topics" In honor of Professor Masanobu Taniguchi on the occasion of his retirement at Biwako Hotel)

- [EN, invited] Self-weighted GEL method based on spatial median (Waseda international symposium on "Topological Data Science, Causality, Analysis of Variance, & Time Series", dedicated to Professor Taniguchi's retirement at Waseda University)

2021

- [JP]   ((   ) at   )

- [JP] Self-weighted estimator for heavy tailed time varying processes (2021   at   . Joint work with Konstantinos Fokianos and Junichi Hirukawa)

- [EN] Statistical inference for nonstationary heavy-tailed time series models by L1 approach (Innovative development of theory and methodology on statistical science in various fields at Niigata University (Online). Joint work with Konstantinos Fokianos and Junichi Hirukawa)

- [EN, invited] Robust regression methods in heavy-tailed processes and spherical predictors (Waseda Cherry Blossom Workshop on Topological Data Science at Waseda University)

2020

- [JP] Robust regression on hyper-spheres with unspecified heteroscedastic errors (2020   at   )

- [JP] Inference for heavy-tailed time varying processes by self-weighting (2020   at   . Joint work with Konstantinos Fokianos and Junichi Hirukawa)

- [EN, invited] Robust regression on hyper-spheres with unspecified heteroscedastic errors and smooth approximation of object functions (Mini Waseda International Symposium at Waseda University)

2019

- [EN, invited] Self-weighted GEL method for heavy-tailed ARMA models and its applications to various problems (CMStatistics 2019 (Organized Session CO380 by Ilia Negri) at University of London)

- [JP, invited] Robust local linear inference for heavy-tailed non-regular processes (SWET: Summer Workshop on Economic Theory 2019 at   )

- [EN, invited] Robust causality test of infinite variance processes (EcoSta 2019 (Organized Session EO123 by myself) at National Chung Hsing University)

- [EN, invited] Hybrid GEL test for rotational symmetry on spheres (Workshop on causal inference in complex marine ecosystems at Institute of Marine Research, Norway)

- [EN, invited] Robust causality test of infinite variance processes (Statistical Methods and Models for Complex Data at University of Sannio. Joint work with Masanobu Taniguchi and Anna Clara Monti)

- [EN, invited] Nonparametric L1 regression for spherical data with heavy-tailed dependent errors (Statistics Seminar at Lancaster University)

- [EN, invited] Robust local linear inference for spherical-linear regression models (Mini Workshop on TDA, Time Series and Statistics at Waseda University)

- [JP]   (
          2019   at   )

- [EN, invited] Hybrid GEL test for rotational symmetry on spheres (Kinosaki Seminar "Data Science and Causality" at Blue Ridge Hotel)

- [EN, invited] Robust causality test of infinite variance processes (Waseda International Symposium "Introduction of General Causality to Various Data and its Applications" at Waseda University. Joint work with Masanobu Taniguchi and Anna Clara Monti)

2018

- [EN] GEL method for tests of rotational symmetry on spheres (Various studies of statistical analysis for asymptotic theory, circular or time series at Nanzan University)

- [EN] Robust local polynomial regression for circular regression models with heavy-tailed error (Waseda International Symposium "Introduction of General Causality to Various Data and its Innovation of the Optimal Inference" at Waseda University)

- [JP, invited] Robust statistical inference for nonstandard time series models and related topics (Quantitative Finance Seminar at Tokyo Metropolitan University)

- [JP]   (2018
          at   )

- [JP] Robust change point detection by self-weighted GEL method (2018
          at   )

- [JP] Robust statistical inference for multiple time series: Self-weighting and normalization methods (Mathematical Statistics and stochastic analysis for modeling and analysis of complex random systems at Osaka University)

- [JP] Robust statistical inference for multiple time series: Self-weighting and normalization methods (SWET: Summer Workshop on Economic Theory at Otaru University of Commerce)

- [EN, invited] Robust statistical inference for time series regression model by self-normalized subsampling method (EcoSta 2018 (Organized Session EO042 by Kaiji Motegi) at City University of Hong Kong)

- [JP]   Whittle   (2018
          at   . Joint work with Yoshiyuki Tanida and Masanobu Taniguchi. Speaker: Tanida, Y.)

- [JP]   GEL   (2018
     at   )

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- [EN, invited] Asymptotic theory and numerical studies of Whittle estimation for high-dimensional time series (Kochi International Seminar on "Recent Developments of Quantile Method, Causality and High Dim. Statistics" at Kochi University. Joint work with Yoshiyuki Tanida and Masanobu Taniguchi. Speaker: Tanida, Y.)

- [EN, invited] Local asymptotic power of self-weighted GEL method and choice of weighting function (Kochi International Seminar on "Recent Developments of Quantile Method, Causality and High Dim. Statistics" at Kochi University)

- [EN, invited] Robust GEL test in infinite variance processes and its application to change point tests (Kagawa International Symposium "Recent Developments in Statistics and Econometrics" at Kagawa University)

- [EN, invited] Self-normalized subsampling method for time series regression models with heavy-tailed long-memory noise (Waseda International Symposium on "Recent Developments in Time series Analysis: Quantile Regression, High Dimensional Data and Causality" at Waseda University. Joint work with Shuyang Bai and Murad Taqqu)

- [EN, invited] Robust statistical inference for non-standard time series models by empirical likelihood, self-weighting and self-normalization (Departmental Colloquia at Texas A&M University)

2017

- [JP, invited]   (
        at   )

- [JP, invited]   (
     at   )

- [EN, invited] Robust confidence region for time series regression models under the presence of infinite variance and long-memory (Kyoto (Fushimi-Uji) International Seminar on "Recent Developments for Statistical Science" at   . Joint work with Shuyang Bai and Murad Taqqu)

- [EN, invited] Self-weighted GEL method for linear hypothesis in infinite variance processes and its application to change point tests (Waseda International Symposium on "Recent Developments for Statistical Asymptotic Theory for Time Series and Circular Distributions" at Waseda University)

- [JP, invited]
   (VIII   2017   at   )

- [EN] Self-normalized subsampling method for non-standard time series regression models (2017   at   )

- [EN, invited] Robust GEL method for linear hypothesis of infinite variance processes (EcoSta 2017 (Organized Session EO094 by Kaiji Motegi) at The Hong Kong University of Science and Technology)

- [EN, invited] Change point detection by self-weighted empirical likelihood method and its application to real data (A Symposium on Complex Data Analysis at National Tsing Hua University)

- [JP] Self-normalized and random weighting approach to likelihood ratio test for the model diagnostics of stable processes (　　　　　　 2017　　　　 at　　　　　　)

- [JP] Quantile regression-based self-normalized block sampling method for linear regression model with dependent errors (　　　　　 2017　　　 at　　　　　 . Joint work with Shuyang Bai and Murad Taqqu)

- [EN, invited] Robust GEL test for linear hypothesis of infinite variance time series models (Ise-Shima Seminar "High Dimensional Statistical Analysis for Time Spatial Processes and Quantile Analysis for Time Series" at Ise-Shima Royal Hotel)

- [EN, invited] Empirical likelihood approach for robust change point detection of infinite variance time series models (Keio International Symposium on "Statistical Analysis for High-Dimensional, Circular or Time Series Data" at Keio University. Joint work with Holger Dette and Yan Liu)

- [EN, invited] A self-normalized block sampling method to quantile regression on time series (Waseda International Symposium on "High Dimensional Statistical Analysis for Time Spatial Processes and Quantile Analysis for Time Series" at Waseda University. Joint work with Shuyang Bai and Murad Taqqu)

2016

- [EN, invited] Self-normalized and random weighting approach to likelihood ratio test for the model diagnostics of stable processes (Hokkaido International Symposium on "Recent Developments of Statistical Theory in Statistical Science" at Hokkaido University)

- [EN, invited] Quantile regression based self-normalized block sampling method for linear regression model with dependent errors (Waseda International Symposium on "High Dimensional Statistical Analysis for Time Spatial Processes and Quantile Analysis for Time Series" at Waseda University. Joint work with Shuyang Bai and Murad Taqqu)

- [JP]　　　　　　　　　　　 L1-　　　　　　　　　　　 (　　　　　 2016　　　　 at　　　　)

- [JP]　　　　　　　　　　　　　　　　　　　　　　　　　　　　　 (2016　　　　　　　　　　　　 at　　　　)

- [EN] Empirical likelihood and self-weighting approach for hypothesis testing of infinite variance processes and its applications (Boston University/Keio University Workshop 2016 at Boston University)

- [JP]　　　　　　　　　　　　　 ARMA　　　　　　　 (　　　　　 2016　　 at　　　)

- [JP] LAD-based empirical likelihood method for linear hypothesis and its local asymptotic power (　　　　 2016　　　　 at　　　　)

- [EN, invited] Self-weighted empirical likelihood approach for infinite variance processes (Kumamoto International Symposium on "High Dimensional Statistical Analysis and Quantile Analysis for Time Series" at Kumamoto University)

- [EN, invited] LAD-based empirical likelihood method and its local asymptotic power (Waseda International Symposium on "High Dimensional Statistical Analysis for Time Spatial Processes and Quantile Analysis for Time Series" at Waseda University)

2015

- [EN, invited] Frequency domain self-weighted empirical likelihood for stable processes (Hakone Seminar at Hotel Green Plaza Hakone)

- [EN, invited] Self-weighted empirical likelihood for heavy-tailed autoregressive processes (Waseda International Symposium on "High Dimensional Statistical Analysis for Time-Spatio Temporal Processes and Quantile Analysis for Time Series" at Waseda University)

- [JP] GMM   2   (
  2015   at   )

- [EN, invited] Higher-order asymptotic properties of generalized empirical likelihood estimator for alpha-stable processes (Waseda International Symposium on "Asymptotic Sufficiency, Asymptotic Efficiency and Semimartingale" at Waseda University)

- [EN] Higher-order asymptotic properties of generalized empirical likelihood estimator for alpha-stable processes (Seminar talk at Technical University of Munich)

2014

- [JP] Frequency domain GMM estimators for stable processes and its asymptotic optimality (Kaken Symposium at Niigata University)

- [JP] On the second-order asymptotic efficiency of frequency domain GMM estimators (
      2014   at   )

- [JP] Higher-order asymptotic properties of frequency domain GMM estimators (Kaken Symposium at Nara University of Education)

- [EN] Nonparametric LAN approach for frequency domain GMM-type hypothesis testing (Waseda International Symposium on "High Dimensional Statistical Analysis and Related Topics" at Waseda University)

- [JP] LAN and frequency domain GMM approach to optimality of hypothesis testing (
      2014   at   )

- [EN] Empirical likelihood ratio for symmetric alpha-stable processes (Waseda International Symposium on "Stable Process, Semimartingale, Finance and Pension Mathematics" at Waseda University. Joint work with Yan Liu and Masanobu Taniguchi)

2013

- [JP] An empirical likelihood approach toward discriminant analysis for non-Gaussian vector stationary processes (2013   at   )

- [JP] An empirical likelihood approach toward discriminant analysis for non-Gaussian vector stationary processes (KAKENHI Symposium on "Recent Advances in Statistical Theory and Applications for High Dimensional Data Analysis and Related Topics" at Otaru University of Commerce)

- [JP] Empirical likelihood approach for symmetric alpha-stable linear processes (
    2013   at   . Joint work with Masanobu Taniguchi)

Teaching

- University of Tokyo

  2020-2025 Probability Theory I and II

  2019 Time Series Analysis I

- Waseda University

  2018 Exercise in Actuarial Probability (   ), Exercise in Actuarial
    Statistics (   ), Survey of Mathematical Science A

  2017 Mathematics A1 (Linear algebra), Fundamental Mathematics, Exercises in Modern
    Mathematics

Personal

- Born: October 1988
- Citizenship: Japan
- Languages: Japanese (native), English