Matteo Sesia

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Academic Positions

University of Southern California, Marshall School of Business:

Kenneth King Stonier Assistant Professor of Business Administration (05/2024–present)
Assistant Professor of Data Sciences and Operations, tenure-track (06/2020–present)

University of Southern California, Viterbi School of Engineering:

Assistant Professor of Computer Science, by courtesy (01/2023–present)

Other Professional Activities

Visiting scholar, Collegio Carlo Alberto (Torino, Italy). (05/2023)

Research intern, Adobe Inc. (San Jose, California). (06/2017–08/2017)

Education

Ph.D. in Statistics, Stanford University (2020). Advisor: Emmanuel Candès.
Thesis title: New methods for variable importance testing with applications to genetic studies.

M.S. in Physics of Complex Systems, Politecnico di Torino and Université Paris-Sud (2015).
Graduated *cum laude* (highest honors).

M.A. in Statistics and Applied Mathematics, Collegio Carlo Alberto (2015).
Graduated *with distinction* (highest honors).

B.S. in Engineering Physics, Politecnico di Torino (2013).
Graduated *cum laude* (highest honors).

Funding and awards

USC-Capital One Center for Responsible AI Decision Making in Finance, (PI), 2025 (1-year). ($84,000)

GenAI Research Grant (co-PI), University of Southern California, 2023–2024 (1 year). ($100,000)

Dr. Douglas Basil Award for Junior Business Faculty (USC Marshall), 2023.

National Science Foundation Grant DMS 2210637 (PI), 2022–2025 (3 years). ($160,000)

Amazon Research Award (PI), 2022–2023 (1 year). ($120,000)

Jerome H. Friedman Applied Statistics Dissertation Award (Stanford University), 2020.

Teaching

University of Southern California:

GSBA 524: Business Data Science (graduate), Spring 2024, Spring 2025.
DSO 522: Applied Time Series Analysis for Forecasting (graduate), Fall 2024.
GSBA 506b: Applied Managerial Statistics (graduate), Spring 2023.
BUAD 310: Applied Business Statistics (undergraduate), Fall 2020, Fall 2021.

Università di Torino and Collegio Carlo Alberto:

Predictive uncertainty in ML with conformal inference (graduate), May 2023.

Stanford University:

Stats 390: Consulting Workshop (graduate), Summer 2018.
Stats 195: Introduction to R (undergraduate), Spring 2018, Spring 2020.

Publications and Preprints

Publications in refereed journals (statistics and general-interest)

[1] M. Sesia, Y. X. Wang, X. Tong. Adaptive conformal classification with noisy labels. *Journal of the Royal Statistics Society Series B (Statistical Methodology)* (2024) https://doi.org/10.1093/jrsssb/qkae114

[2] M. Beraha, S. Favaro, M. Sesia. Random measure priors in Bayesian recovery from sketches. *Journal of Machine Learning Research* (2024) https://jmlr.org/papers/v25/23-1058.html

[3] Z. Liang, M. Sesia, W. Sun. Integrative conformal p-values for powerful out-of-distribution testing with labeled outliers. *Journal of the Royal Statistics Society Series B (Statistical Methodology)* (2024) https://doi.org/10.1093/jrsssb/qkad138

[4] M. Sesia, S. Favaro, E. Dobriban. Conformal frequency estimation using discrete sketched data with coverage for distinct queries. *Journal of Machine Learning Research* (2023) https://jmlr.org/papers/v24/22-1278.html

[5] S. Bates, E. Candès, L. Lei, Y. Romano, M. Sesia. Testing for outliers with conformal p-values. *Annals of Statistics* (2023). https://doi.org/10.1214/22-aos2244

[6] S. Li, Z. Ren, C. Sabatti, M. Sesia. Transfer learning in genome-wide association studies with knockoffs. *Sankhya B* (2022) https://doi.org/10.1007/s13571-022-00297-y

[7] S. Li, M. Sesia, Y. Romano, E. Candès, C. Sabatti. Searching for robust associations with a multi-environment knockoff filter. *Biometrika* (2021). https://doi.org/10.1093/biomet/asab055

[8] M. Sesia, S. Bates, E. Candès, J. Marchini, C. Sabatti. False discovery rate control in genome-wide association studies with population structure. *Proceedings of the National Academy of Sciences* (2021). https://doi.org/10.1073/pnas.2105841118

[9] S. Bates, M. Sesia, C. Sabatti, E. Candès. Causal inference in genetic trio studies. *Proceedings of the National Academy of Sciences* (2020). https://doi.org/10.1073/pnas.2007743117

[10] M. Sesia, E. Katsevich, S. Bates, E. Candès, C. Sabatti. Multi-resolution localization of causal variants across the genome. *Nature Communications* (2020). https://doi.org/10.1038/s41467-020-14791-2

[11] M. Sesia, E. Candès. A comparison of some conformal quantile regression methods. *Stat* (2020). http://dx.doi.org/10.1002/sta4.261

[12] Y. Romano, M. Sesia, E. Candès. Deep knockoffs. *Journal of the Americal Statistical Association* (2019). https://doi.org/10.1080/01621459.2019.1660174

[13] M. Sesia, C. Sabatti, E. Candès. Rejoinder: "Gene hunting with hidden Markov model knockoffs". *Biometrika* (2019). https://doi.org/10.1093/biomet/asy075

[14] M. Sesia, C. Sabatti, E. Candès. Gene hunting with hidden Markov model knockoffs. *Biometrika* (2019). https://doi.org/10.1093/biomet/asy033

Publications in refereed conferences (computer science)

[15] Y. Zhou, M. Sesia. Conformal Classification with Equalized Coverage for Adaptively Selected Groups *NeurIPS* (2024, recently accepted) https://arxiv.org/abs/2405.15106

[16] X. Huang, S. Li, M. Yu, M. Sesia, H. Hassani, I. Lee, O. Bastani, E. Dobriban. Uncertainty in Language Models: Assessment through Rank-Calibration. *Conference on Empirical Methods in Natural Language Processing* (2024, recently accepted) https://arxiv.org/abs/2404.03163

[17] Y. Zhou, L. Lindemann, M. Sesia. Conformalized adaptive forecasting of heterogeneous trajectories. *ICML* (2024). https://arxiv.org/abs/2402.09623

[18] M. Bashari, A. Epstein, Y. Romano, M. Sesia. Derandomized novelty detection with FDR control via conformal e-values. *NeurIPS* (2023) https://arxiv.org/abs/2302.07294

[19] Z. Liang, Y. Zhou, M. Sesia. Conformal inference is (almost) free for neural networks trained with early stopping. *ICML* (2023). https://proceedings.mlr.press/v202/liang23i.html

[20] B. Einbinder, Y. Romano, M. Sesia, Y. Zhou. Training uncertainty-aware classifiers with conformalized deep learning. *NeurIPS* (2022) https://arxiv.org/abs/2205.05878

[21] M. Sesia, S. Favaro. Conformal frequency estimation with sketched data. *NeurIPS* (2022) https://arxiv.org/abs/2204.04270

[22] N. Fingerhut, M. Sesia, Y. Romano. Coordinated double machine learning. *ICML* (2022). https://proceedings.mlr.press/v162/fingerhut22a.html

[23] M. Sesia, Y. Romano. Conformal prediction using conditional histograms. *NeurIPS* (2021). https://arxiv.org/abs/2105.08747 (selected as "Spotlight" paper)

[24] Y. Romano, M. Sesia, E. Candès. Classification with valid and adaptive coverage. *NeurIPS* (2020). https://arxiv.org/abs/2006.02544 (selected as "Spotlight" paper)

Publications in refereed journals (biomedicine and healthcare)

[25] M. A. Juratli, D. Roy, E. Oppermann, M. Sesia, A. Schnitzbauer, J. Hoelzen, S. Katou, H. Morgul, B. Strucker, A. Pascher, M. Heikenwalder, W. O. Bechstein. Long-term effect of liver resection on circulating stem cells expressing PD-L1 in patients with hepatocellular carcinoma – Pilot study. *Zeitschrift für Gastroenterologie* (2022) https://www.thieme-connect.com/products/ejournals/abstract/10.1055/s-0042-1754779

[26] M. A. Juratli, D. Roy, E. Oppermann, M. Sesia, A. Schnitzbauer, J. Hoelzen, S. Katou, H. Morgul, B. Strucker, A. Pascher, W. O. Bechstein. Long-term dynamics of circulating tumor cells and their prognostic relevance after liver resection in patients with hepatocellular carcinoma. *Zeitschrift für Gastroenterologie* (2022) https://www.thieme-connect.com/products/ejournals/html/10.1055/s-0042-1754884

[27] J. Hoelzen, K. Sander, M. Sesia, D. Roy, E. Rijcken, A. Schnabel, B. Strücker, M. Juratli, A. Pascher. Robotic-assisted esophagectomy leads to significant reduction in postoperative acute pain: A retrospective clinical trial. *Annals of Surgical Oncology* (2022) https://doi.org/10.1245/s10434-022-12200-0.

[28] A. Fayazi, M. Sesia, K. S. Anand. Hyperoxemia among pediatric intensive care unit patients receiving oxygen therapy. *Journal of Pediatric Intensive Care* (2021). https://doi.org/10.1055/s-0041-1740586

[29] C. Chia, M. Sesia, C.-S. Ho, S. Jeffrey, J. Dionne, E. Candès, R. Howe. Interpretable classification of bacterial Raman spectra with knockoff wavelets. *IEEE Journal of Biomedical and Health Informatics* (2021). https://doi.org/10.1109/JBHI.2021.3094873

Pre-print manuscripts (under review or revision)

[30] M. Bashari, M. Sesia, Y. Romano. Robust Conformal Outlier Detection under Contaminated Reference Data. (2025) https://arxiv.org/abs/2502.04807

[31] T. Bortolotti, Y. X. R. Wang, X. Tong, A. Menafoglio, S. Vantini, M. Sesia. Noise-Adaptive Conformal Classification with Marginal Coverage. (2025) https://arxiv.org/abs/2501.18060

[32] M. Sesia, V. Svetnik. Doubly Robust Conformalized Survival Analysis with Right-Censored Data. (2024) https://arxiv.org/abs/2412.09729

[33] P. Gablenz, M. Sesia, T. Sun, C. Sabatti. Searching for local associations while controlling the false discovery rate. (2024) https://arxiv.org/abs/2412.02182

[34] C. Magnani, M. Sesia, A. Solari. Collective Outlier Detection and Enumeration with Conformalized Closed Testing (2024) https://arxiv.org/abs/2308.05534

[35] Z. Liang, T. Xie, X. Tong, M. Sesia. Structured Conformal Inference for Matrix Completion with Applications to Group Recommender Systems. (2024) https:/arxiv.org/abs/2404.17561

[36] M. Beraha, S. Favaro, M. Sesia. A smoothed-Bayesian approach to frequency recovery from sketched data. (2023) https://arxiv.org/abs/2309.15408

Patents

M. Sesia and Y. Abbasi-Yadkori (Adobe Inc). "Recommendation system using linear stochastic bandits and confidence interval generation". US 11,100,559. August 24, 2021.

External Service

Journal referee: Annals of Statistics, Bayesian Analysis, Biometrika, Briefings in Bioinformatics, Electronic Journal of Statistics, Human Genetics, Information Sciences, Journal of Computational and Graphical Statistics, Journal of Machine Learning Research, Journal of the American Statistical Association, Journal of the Royal Statistical Society, Machine Learning, Nature Communications, Operations Research, SIAM Journal on Mathematics of Data Science, Statistics and Computing, Statistics and Probability Letters, Statistics in Medicine, Statistical Science.

Conference referee: COLT, COPA, ISIT, NeurIPS, ICML.

Ad-hoc grant reviewer: Israel Science Foundation 2022, 2024. Israel Ministry of Innovation, Science and Technology, 2024.

Grant review panelist: National Science Foundation 2023, 2024.

Conference session organizer: SEEDS (2024), WNAR (2024).

Internal Service

Statistics seminar organizer (2021–2022, 2022–2023); faculty hiring committee (2021–2022, 2022–2023); PhD admission committee (2020–2021, 2021–2022).

Executive committee for the Inaugural 2024 SEEDS conference.

Dissertation committee: Gregory Faletto (Data Sciences and Operations), Jacob Gizamba (Population, Health and Place). Qualifying exam committee: Yiqiu Shen (Data Sciences and Operations).

Students

Current students: Tianmin Xie (PhD, Data Sciences and Operations), Yanfei Zhou (PhD, Data Sciences and Operations).

Past students: Ziyi Liang (PhD in Mathematics, 2024). Now post-doctoral researcher at UC Irvine.

Presentations

Keynote lectures

Conformal and Probabilistic Prediction with Applications. (09/09/2024), in Milan, Italy.

Invited seminar presentations

Harvard University, Department of Statistics. 04/22/2024, in Cambridge, MA.

University of Pennsylvania, Department of Statistics and Data Science. 04/17/2024, in Philadelphia, PA.

University of Washington, Department of Biostatistics. 11/09/2023, in Seattle, WA.

University of Pittsburgh, Department of Statistics. 10/23/2023, in Pittsburgh, PA.

Polytechnic University of Milan, Department of Mathematics. 09/21/2023, in Milan, Italy.
Università Cattolica, Department of Statistical Sciences. 05/18/2023, in Milan, Italy.
Collegio Carlo Alberto, Statistics Seminar. 05/11/2023, in Torino, Italy.
University of California - Irvine, Department of Mathematics. 03/06/2023, in Irvine, CA.
University of Southern California, Department of Computer Science, 10/27/2022, in Los Angeles, CA.
University of California - Santa Cruz, Department of Statistics. 10/17/2022, in Santa Cruz, CA.
University of Southern California, Department of Economics, 02/25/2022, in Los Angeles, CA.
Yale University, School of Public Health. 02/16/2021, in New Haven, CT (remote).
University of Nottingham, School of Mathematical Sciences. 12/17/2020, in Nottingham, UK (remote).
University of Milan - Bicocca, DEMS Department. 12/02/2020, in Milan, Italy (remote).
Johns Hopkins University, Mathematical Institute for Data Science. 02/18/2020, in Baltimore, MD.
University of Southern California, DSO Department. 01/27/2020, in Los Angeles, CA.
University of California - Davis, Department of Statistics. 01/06/2020, in Davis, CA.
Stanford University, Statistics Department. 07/16/2019, in Stanford, CA.
Collegio Carlo Alberto, Statistics Seminar. 12/19/2018, in Torino, Italy.
Université Grenoble Alpes, Bayes in Grenoble Seminar. 07/10/2018, in Grenoble, France.

Invited conference and workshop presentations

SIAM MDS 2024, mini-symposium on Mathematics of Responsible ML, 10/21/2024, in Atlanta, GA.
WNAR of the International Biometric Society, 06/12/2024, in Fort Collins, CO.
International Conference on Statistics and Data Science, 12/18/2023, in Lisbon, Portugal.
Joint Statistical Meeting, Invited Poster Session. 08/06/2023, in Toronto, Canada.
Computational Genomics Summer Institute, 07/15/2023, in Big Bear Lake, CA.
Boston University, New England Statistics Symposium (short course). 06/04/2023, in Boston, MA.
National Institute of Statistical Sciences. 04/19/2023, in Washington, D.C. (remote).
International Conference on Statistics and Data Science, 12/13/2022, in Florence, Italy.
SIAM Symposium on Mathematics of Interpretable ML, 09/30/2022, in San Diego, CA.
Computational Genomics Summer Institute, 07/07/2022, in Big Bear Lake, CA.
International Seminar on Selective Inference, 06/02/2022, (remote).
Stanford University, Statistics Industrial Affiliates Meeting. 02/22/2019, in Stanford, CA.

Invited industry presentations

Merck & Co., Inc. 02/10/2022, in Morristown, NJ (remote).
Regeneron Pharmaceuticals, Inc. 09/17/2019, in Eastview, NY.
23andMe, Inc. 05/21/2019, in Mountain View, CA.

Invited discussions

International Seminar on Selective Inference, Nov. 15/2023, (remote).
International Seminar on Selective Inference, Nov. 17/2022, (remote).
International Seminar on Selective Inference, 10/22/2020, (remote).

Contributed conference and workshop presentations

Joint Statistical Meeting, Topic-Contributed Paper Session. 08/09/2023, in Toronto, Canada.
RMDS Lab, IM DATA Conference 2022, 08/14/2022, in Los Angeles, CA.
ICML, spotlight presentation. 07/19/2022, in Baltimore, MD.
NeurIPS, spotlight presentation. 12/09/2021 (remote).
RMDS Lab, IM DATA Conference, 10/28/2021, in Pasadena, CA (remote).
RMDS Lab, IM DATA Conference, 11/02/2020, in Pasadena, CA (remote).
NeurIPS, spotlight presentation. 12/08/2020 (remote).

Royal Statistics Society Conference, 09/04/2018, in Cardiff, United Kingdom.
Workshop on Model Selection, Regularization and Inference, 07/13/2018, in Vienna, Austria.
Computational and Methodological Statistics Conference, 12/17/2017, in London, UK.

Contributed poster presentations

NeurIPS, 12/13/2024, in Vancouver, Canada.
ICML, 07/19/2022, in Baltimore, MD.
American Society for Human Genetics Annual Meeting, 10/20/2021, virtual meeting.
ICML Workshop on distribution-free uncertainty quantification, 07/24/2021, virtual meeting.
American Society for Human Genetics Annual Meeting, 10/28/2020, virtual meeting.
American Society for Human Genetics Annual Meeting, 10/16/2019, in Houston, TX.
Higher-Order Asymptotics and Post-Selection Inference Workshop, 08/18/2019, in St. Louis, MO.
American Society for Human Genetics Annual Meeting, 10/18/2018, in San Diego, CA.