Matteo Sesia

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Academic Positions

Assistant Professor (tenure-track). June 2020–present. Department of Data Sciences and Operations, Marshall School of Business, University of Southern California.

Education

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

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

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

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

Funding

[1] NSF grant DMS 2210637, "Dependable predictive inference with uncertainty-aware machine learning", sole PI, 2022–2025. ($160,000)

Awards

Jerome H. Friedman Applied Statistics Dissertation Award, 2020.

International Master's Scholarship, Université Paris-Saclay, 2014–2015.

Allievi Honors Program, Collegio Carlo Alberto, 2011–2015.

Other research positions

Research intern. June–Aug. 2017. Adobe Inc. Supervisor: Yasin Abbasi-Yadkori.
Invented and patented an adaptive linear stochastic bandit algorithm for online recommendation systems.

Teaching

University of Southern California:

BUAD 310: Applied Business Statistics (undergraduate), Fall 2020, Fall 2021.

DSO 621: Research Forum (graduate), Spring 2021 (contributed).

Stanford University:

Stats 390: Consulting Workshop (graduate), Summer 2018.

Stats 195: Introduction to R (undergraduate), Spring 2018, Spring 2020.

Publications and Preprints

Publications*

[1] 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. *Ann. Surg. Oncol.* (2022) https://doi.org/10.1245/s10434-022-12200-0.

*Asterisks indicate equal contributions.

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

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

[4] 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

[5] M. Sesia, Y. Romano. Conformal regression with conditional histograms. *NeurIPS* (spotlight) (2021). https://arxiv.org/abs/2105.08747

[6] M. Sesia, S. Bates, E. Candès, J. Marchini, C. Sabatti. False discovery rate control in genome-wide association studies with population structure. *Proc. Natl. Acad. Sci. U.S.A.*, 118 (40) (2021). https://doi.org/10.1073/pnas.2105841118

[7] 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 J. Biomed. Health. Inform.* (2021). https://doi.org/10.1109/JBHI.2021.3094873

[8] Y. Romano,* M. Sesia,* E. Candès. Classification with valid and adaptive coverage. *NeurIPS* (spotlight) (2020). https://arxiv.org/abs/2006.02544

[9] S. Bates, M. Sesia, C. Sabatti, E. Candès. Causal inference in genetic trio studies. *Proc. Natl. Acad. Sci. U.S.A.*, 117 (39) 24117-24126 (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 Commun.*, 11, 1093 (2020). https://doi.org/10.1038/s41467-020-14791-2

[11] M. Sesia, E. Candès. A comparison of some conformal quantile regression methods. *Stat*, 9:e261 (2020). http://dx.doi.org/10.1002/sta4.261

[12] Y. Romano,* M. Sesia,* E. Candès. Deep knockoffs. *J. Am. Stat. Assoc.* (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*, 106, 35–45 (2019). https://doi.org/10.1093/biomet/asy075

[14] M. Sesia, C. Sabatti, E. Candès. Gene hunting with hidden Markov model knockoffs. *Biometrika*, 106, 1–18 (2019). https://doi.org/10.1093/biomet/asy033

Preprints

[1] M. Sesia, Tianshu Sun. Individualized conditional independence testing under model-X with heterogeneous samples and interactions. (2022) (*under review, J. Am. Stat. Assoc.*) https://arxiv.org/abs/2205.08653

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

[3] M. Sesia, S. Favaro. Conformalized frequency estimation from sketched data. (2022) (*under review, NeurIPS*) https://arxiv.org/abs/2204.04270

[4] S. Li,* Z. Ren,* C. Sabatti,* M. Sesia.* Transfer learning in genome-wide association studies with knockoffs. (2021). (*under review, Sankhya*) https://arxiv.org/abs/2108.08813

[5] S. Bates,* E. Candès,* L. Lei,* Y. Romano,* M. Sesia*. Testing for outliers with conformal p-values. (2021). (*under 2nd round review, Annals of Statistics*) https://arxiv.org/abs/2104.08279

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.

Professional Service

Journal referee:[†] Annals of Statistics (5), Bayesian Analysis (1), Biometrika (5), Briefings in Bioinformatics (1), Electronic Journal of Statistics (1), Human Genetics (1), Information Sciences (1), Journal of Machine Learning Research (1), Journal of the American Statistical Association (3), Journal of the Royal Statistical Society B (2), Nature Communications (1), Operations Research (1), SIAM Journal on Mathematics of Data Science (1), Statistics and Probability Letters (1), Statistics in Medicine (1), Statistical Science (2).

Conference referee: COLT (1), ISIT (1), NeurIPS (14), ICML (8).

Ad-hoc grant reviewer: Israel Science Foundation (1).

Department Service

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

Students

Current USC students: Cora Liang (Math, PhD, 5th year), Tianmin Xie (Data Sciences and Operations, PhD, 1st year), Shunan Yao (Math, 5th year), Yanfei Zhou (Data Sciences and Operations, PhD, 2nd year).

Past USC students: Xuanqi Zhang (Financial Engineering, Master, Fall 2021).

Dissertation committees: Gregory Faletto (Data Sciences and Operations).

Qualifying exam committees: Yiqiu Shen (Data Sciences and Operations).

Presentations

Invited presentations

Computational Genomics Summer Institute, July 7, 2022, in Big Bear Lake, CA.
International Seminar on Selective Inference, June 2, 2022, (remote).
University of Southern California, Department of Economics, Feb. 25, 2022, in Los Angeles, CA.
Merck & Co., Inc. Feb. 10, 2022, in Morristown, NJ (remote).
Yale University, School of Public Health. Feb. 16, 2021, in New Haven, CT (remote).
University of Nottingham, School of Mathematical Sciences. Dec. 17, 2020, in Nottingham, UK (remote).
University of Milano - Bicocca, DEMS Department. Dec. 2, 2020, in Milano, Italy (remote).
Johns Hopkins University, Mathematical Institute for Data Science. Feb. 18, 2020, in Baltimore, MD.
University of Southern California, DSO Department. Jan. 27, 2020, in Los Angeles, CA.
UC Davis, Department of Statistics. Jan. 6, 2020, in Davis, CA.
Regeneron Pharmaceuticals, Inc. Sept. 17, 2019, in Eastview, NY.
23andMe, Inc. May 21, 2019, in Mountain View, CA.
Stanford University, Statistics Department. July 16, 2019, in Stanford, CA.
Stanford University, Statistics Industrial Affiliates Meeting. Feb. 22, 2019, in Stanford, CA.
Collegio Carlo Alberto, Statistics Seminar. Dec. 19, 2018, in Torino, Italy.
Université Grenoble Alpes, Bayes in Grenoble Seminar. July 10, 2018, in Grenoble, France.

Contributed presentations

[†]Brackets contain the number of manuscripts reviewed.

RMDS Lab, IM DATA Conference 2022, Aug. 14, 2022, in Los Angeles, CA.
ICML, spotlight presentation. July 19, 2022, in Baltimore, MD.
NeurIPS, spotlight presentation. Dec. 9, 2021 (remote).
RMDS Lab, IM DATA Conference 2021, Oct. 28, 2021, in Pasadena, CA (remote).
RMDS Lab, IM DATA Conference 2020, Nov. 2, 2020, in Pasadena, CA (remote).
NeurIPS, spotlight presentation. Dec. 8, 2020 (remote).
Royal Statistics Society Conference, Sept. 3–6, 2018, in Cardiff, United Kingdom.
Workshop on Model Selection, Regularization and Inference, July. 12–14, 2018, in Vienna, Austria.
Computational and Methodological Statistics Conference, Dec. 16–18, 2017, in London, United Kingdom.

Poster presentations

ICML. July 19, 2022, in Baltimore, MD.
American Society for Human Genetics Annual Meeting, Oct. 18–22, 2021, virtual meeting.
ICML Workshop on distribution-free uncertainty quantification, July 24, 2021, virtual meeting.
American Society for Human Genetics Annual Meeting, Oct. 27–30, 2020, virtual meeting.
American Society for Human Genetics Annual Meeting, Oct. 15–19, 2019, in Houston, TX.
Higher-Order Asymptotics and Post-Selection Inference Workshop, Aug. 17–19, 2019, in St. Louis, MO.
American Society for Human Genetics Annual Meeting, Oct. 16–20, 2018, in San Diego, CA.