Maria Skoularidou (she/her)

CONTACT INFORMATION

The Broad Institute of M.I.T. and Harvard,
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Cambridge, MA 02142

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RESEARCH INTERESTS

Theory and methodology of probabilistic machine learning; theory and methodology of diffusion models; theory and methodology of Bayesian inference; information theory; computational genomics; brain imaging.

EDUCATION

University of Cambridge, Cambridge, U.K.

Ph.D., Biostatistics, 2023

- Dissertation Title: "Using Generative Modelling in Healthcare"
- Supervisor: Professor Sylvia Richardson

Athens University of Economics and Business, Athens, Greece

(Two-year) M.Sc, Statistical Science, 2015 (summa cum laude)

- Thesis Title: "Context Tree Weighting for Signal Processing, Bayesian Inference and Model Selection: Theory and Algorithms"
- Supervisor: Professor Petros Dellaportas

Athens University of Economics and Business, Athens, Greece

(Four-year) Degree, Computer Science, 2013

ACADEMIC EXPERIENCE

Postdoctoral Associate, Eric And Wendy Schmidt Center, Broad Institute of M.I.T. and Harvard, U.S.A — **09/2023- present**
Advisors: Professor Constantinos Daskalakis, M.I.T., C.S.A.I.L.
Associate Professor Nikos Daskalakis, Harvard Medical School

Research Associate, University of Cambridge, U.K. — **06/2023-08/2023**
Principal Investigator: Professor Neil Lawrence

Research Associate, University of Cambridge, U.K. — **01/2022-10/2022**
Principal Investigator: Professor Carola Schönlieb

Visiting Researcher, M.I.T., MA, U.S.A. — **02/2020-12/2020**
Principal Investigator: Professor Constantinos Daskalakis

Research Associate, Athens University of Economics and Business, Greece — **09/2018-05/2019**
Principal Investigator: Professor Petros Dellaportas

Academic collaborator, University of Cambridge, U.K. — **03/2018-09/2018**
Principal Investigator: Professor Sir David Spiegelhalter

Research Associate, Technical University of Crete, Greece — **11/2014-07/2015**
Principal Investigator: Professor Ioannis Kontoyiannis

Research Associate, Athens University of Economics and Business, Greece — **07/2014-03/2016**
Principal Investigator: Professor Petros Dellaportas

Teaching experience

Teaching Assistant (Mentor), M.I.T., U.S.A. **01/2025-06/2025**
Course: Machine Learning for Healthcare

Teaching Assistant (Tutor), University of Cambridge, U.K. **10/2016-12/2019**
Courses: Probability and Statistics, MMath/MASt Part III

Teaching Assistant, University of Cambridge, U.K. **10/2018-12/2018**
Course: Statistics in MPhil in Epidemiology and MPhil in Public Health

Teaching Assistant, Athens University of Economics and Business, Greece **02/2013-07/2013**
Courses: Automata and Complexity, Game and Decision Theory, Computational Mathematics

Publications

1. Evangelos Anagnostou, Anastasia Gamvroula, Maria Kouvli, Evangelia Karagianni, George Stranjalis, Maria Skoularidou, and Theodosis Kalamatianos. A refined vestibular romberg test to differentiate somatosensory from vestibular-induced disequilibrium. *Diagnostics*, 15(13):1621, 2025
2. Theodore Papamarkou, Maria Skoularidou, Konstantina Palla, Laurence Aitchison, Julyan Arbel, David Dunson, Maurizio Filippone, Vincent Fortuin, Philipp Hennig, José Miguel Hernández Lobato, Aliaksandr Hubin, Alexander Immer, Theofanis Karaletsos, Mohammad Emtiyaz Khan, Agustinus Kristiadi, Yingzhen Li, Stephan Mandt, Christopher Nemeth, Michael A. Osborne, Tim G. J. Rudner, David Rügamer, Yee Whye Teh, Max Welling, Andrew Gordon Wilson, and Ruqi Zhang. Position: Bayesian Deep Learning is Needed in the Age of Large-Scale AI. In *Forty-first International Conference on Machine Learning*, 2024
3. Evangelos Anagnostou, Maria Kouvli, Evangelia Karagianni, Anastasia Gamvroula, Theodosis Kalamatianos, George Stranjalis, and Maria Skoularidou. Romberg's test revisited: Changes in classical and advanced sway metrics in patients with pure sensory neuropathy. *Neurophysiologie Clinique*, 54(5):102999, 2024
4. Maria Kouvli, Evangelia Karagianni, Anastasia Gamvroula, Theodosis Kalamatianos, George Stranjalis, Maria Skoularidou, and Evangelos Anagnostou. Balancing with eyes closed: conventional and advanced sway features of the Romberg test in patients and controls. *European Journal of Neurology*, 2023
5. Evangelos Anagnostou, Evangelia Karagianni, and Maria Skoularidou. Joint entropy analysis of anterior-posterior and medial-lateral body sway. *Medical Engineering and Physics*, 2022
6. Ioannis Kontoyiannis, Lambros Mertzanis, Athina Panotopoulou, Ioannis Papageorgiou, and Maria Skoularidou. Bayesian Context Trees: Modelling and Exact Inference for Discrete Time Series. *Journal of the Royal Statistical Society, Series B*, 2022
7. Ioannis Papageorgiou, Ioannis Kontoyiannis, Lambros Mertzanis, Athina Panotopoulou, and Maria Skoularidou. Revisiting Context-Tree Weighting for Bayesian Inference. *ISIT*, 2021
8. Ioannis Papageorgiou, Mertzanis Lambros Kontoyiannis, Ioannis, Athina Panotonoulou, and Maria Skoularidou. Revisiting Context-Tree Weighting for Bayesian Inference. In *2020 IEEE Information Theory Workshop (ITW)*. IEEE, 2020
9. Lei Xu, Maria Skoularidou, Alfredo Cuesta-Infante, and Kalyan Veeramachaneni. Modelling Tabular data using Conditional GAN. In H. Wallach, H. Larochelle, A. Beygelzimer, F. d'Alché-Buc, E. Fox, and R. Garnett, editors, *Advances in Neural Information Processing Systems 32*, pages 7333–7343. Curran Associates, Inc., 2019
10. Lambros Mertzanis, Athina Panotonoulou, Maria Skoularidou, and Ioannis Kontoyiannis. Deep Tree Models for 'Big' Biological Data. In *2018 IEEE 19th International Workshop on Signal Processing Advances in Wireless Communications (SPAWC)*, pages 1–5. IEEE, 2018
11. Ioannis Kontoyiannis and Maria Skoularidou. Estimating the Directed Information and Testing for Causality. *IEEE Transactions on Information Theory*, 62(11):6053–6067, 2016

12. Nick Heard, Konstantina Palla, and Maria Skoularidou. Topic Modelling of Authentication Events in an Enterprise Computer Network. In *2016 IEEE Conference on Intelligence and Security Informatics (ISI)*, pages 190–192. IEEE, 2016
13. Ioannis Kontoyiannis, Athina Panotopoulou, and Maria Skoularidou. Bayesian inference for discrete time series via tree weighting. In *Information Theory Workshop (ITW)*. IEEE, 2012

In Preparation

1. Shorna Alam, Anders Hoel, Greycen Rey, Renzo Soatto, Stephen Bates, Nikolaos Daskalakis, Caroline Uhler, Valentin De Bortoli, and Maria Skoularidou. CountsDiff: A diffusion model on the natural numbers for generation and imputation of count-based data
2. Nikolaos Daskalakis and Maria Skoularidou. On Detection of mMolecular Quantitative Trait Loci in Human Genome Using Advanced Bayesian Methods
3. Carola-Bibiane Schönlieb, Maria Skoularidou, and Jan Stanczuk. Towards Generating Synthetic Electronic Healthcare Records Data Using Inverted GANs

Awards

1. 2023: Blackwell-Rosenbluth Award, International Society for Bayesian Analysis;
2. 2023: Eric and Wendy Schmidt Center Research Scholarship, The Broad Institute of M.I.T. and Harvard, MA, USA;
3. 2023: Crane Award, University of Cambridge, U.K.;
4. 2020: Trinity College Award in Mathematics, University of Cambridge, U.K.;
5. 2019: 36th International Conference on Machine Learning Financial Award, Long Beach, U.S.A.;
6. 2018: International Disabled Students' Award;
7. 2017: Saint Catharine's College Award, University of Cambridge, U.K.;
8. 2016: NIHR Rare Disease PhD Studentship, University of Cambridge, U.K.;
9. 2015: Highest grade since the beginning (1995) of the M.Sc. in Statistical Science, Athens University of Economics and Business, Greece;
10. 2013: Tuition fees scholarship, M.Sc. in Statistical Science, Athens University of Economics and Business, Greece

Presentations (selected)

1. Invited lecturer at "Cambridge Ellis Unit Summer School on Probabilistic Machine Learning 2025", Cambridge, U.K, July 2025;
2. Keynote speaker at "Joint Statistical Meeting", Portland, U.S.A., August 2024;
3. Keynote speaker at "I.E.E.E. International Conference on Human-Robot Interaction", Stockholm, Sweden, March 2023;
4. Invited speaker at European Women in Mathematics General Meeting 2022, Aalto University, Finland, August 2022;
5. Keynote speaker at "Fairness and Diversity in Statistical Science" workshop, University College of London, U.K, July 2021;
6. Poster presentation at 33rd Conference on Neural Information Processing Systems, Vancouver, Canada, December 2019;
7. Keynote speaker at "Women in Statistics" workshop, RSS, London, U.K, March 2019;
8. Oral presentation at 13th Workshop of Women in Machine Learning, Montreal, Canada, December 2018;
9. Invited speaker at BayesComp, Barcelona, Spain, March 2018;

Contribution to society

1. Reviewer at:
   - Nature Computational Science (2023-present);
   - Nature Machine Learning (2023-present);
   - Journal of the Royal Statistical Society, Series B (2022-present);
   - Statistics and Computing (2022-present);
   - Journal Transactions on Machine Learning Research (TMLR, 2022-present);
   - Journal I.E.E.E. Transactions on Cybernetics (2021-present);
   - Neural Information Processing Systems (NeurIPS, 2020-present);
   - International Conference on Machine Learning (ICML, 2020-present);
   - International Conference on Learning Representations (ICLR, 2020-present);
   - Conference on Artificial Intelligence and Statistics (AISTATS, 2020-present)
   - I.E.E.E. International Symposium on Information Theory (ISIT, 2019-present);
   - Journal Entropy (2019-present);
   - Journal I.E.E.E. Transactions on Signal Processing (2017-present);
   - Journal I.E.E.E. Transactions on Information Theory (2016-present);
2. ACM, FAccT Inclusion and Accessibility Co-Chair (2025);
3. ACM Transactions on Probabilistic Machine Learning, member of the editorial board (2023-present);
4. ICML Diversity, Inclusion and Accessibility Co-Chair (2022-present);
5. NeurIPS Diversity, Inclusion and Accessibility Co-Chair (2021-2022);
6. NeurIPS social Co-Chair (2019-2020);
7. European Women in Mathematics coordinator of Greece (2019-2022);
8. Organiser of "Advances and challenges in machine learning programming languages" workshop 20-21/05/2019, University of Cambridge, Cambridge, U.K.;
9. Originator and member of the organising committee of
   - 'Women in Statistics and Data Science" special interest group of the Royal Statistical Society;
   - {Dis}Ability in AI, Chair (2019-present)
10. Member of the organising committee of
    - "Gaussian Process and Uncertainty Quantification Summer School, 2019" , University of Sheffield, Sheffield, U.K.;
    - "MRC-BSU PhD Symposium 2018", University of Cambridge, Cambridge, U.K., Key-note speaker: Professor Philip Dawid (University of Cambridge);
11. Member of the Royal Statistical Society, the American Statistical Association, I.E.E.E. and the International Society for Bayesian Analysis;
12. Mentor of undergraduate, postgraduate and doctoral students (2020-present);
13. PhD representative 2017-2018, MRC-BSU, University of Cambridge, Cambridge, U.K.;

References

1. Professor Constantinos Daskalakis, M.I.T., U.S.A.
2. Professor Caroline Uhler M.I.T., U.S.A.
3. Associate Professor Nikolaos Daskalakis, Harvard Medical School, U.S.A.
4. Professor Carola-Bibiane Schönlieb, University of Cambridge, U.K.
5. Professor Sir David Spiegelhalter, University of Cambridge, U.K. *(retired)*

Languages

Greek (mother tongue), **English** (fluent), **French** (basic)