Saifuddin (Saif) Syed

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November 24, 2023

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Affiliations and Education

2023 –   **Research Staff (Florence Nightingale Bicentenary Fellow and Tutor).**
University of Oxford, Department of Statistics.
Computational statistics and machine learning (OxCSML).

2022 –   **Next-Generation Event Horizon Telescope.**
Member of the Algorithms and Inference Working Group.

2022 – 2023   **Postdoctoral Researcher.**
University of Oxford, Department of Statistics.
Supervised by Arnaud Doucet.
– CoSInES Postdoctoral Fellow.

2017 – 2022   **PhD in Statistics.**
University of British Columbia, Department of Statistics.
Supervised by Alexandre Bouchard-Côté.
Thesis: "Non-reversible parallel tempering on optimized paths".
Dissertation Awards:
– Marshall Prize
– SSC Pierre Robillard Award
– CAIMS Cecil Graham Dissertation Award
– ISBA Savage Award: Theory and Methods (Honourable Mention).

2014 – 2016   **MSc in Mathematics.**
University of British Columbia, Department of Mathematics.
Supervised by Ed Perkins.
Thesis: "Spatial diffusions with singular drifts: The construction of super Brownian motion with immigration at unoccupied sites".

2010 – 2014   **BMath in Mathematics.**
University of Waterloo, Faculty of Mathematics.
– Double major in pure mathematics and applied mathematics.
– Graduated with distinction on the Dean's honours list.

Preprints in review

[1] Nikola Surjanovic*, Miguel Biron-Lattes*, **Saifuddin Syed**, Trevor Campbell, Alexandre Bouchard-Côté. "autoMALA: Locally adaptive Metropolis-adjusted Langevin algorithm." Submitted For Review, 2023. Available at arXiv:2310.16782

[2] Nikola Surjanovic, Miguel Biron-Lattes, Paul Tiede, **Saifuddin Syed**, Trevor Campbell, Alexandre Bouchard-Côté. "Pigeons.jl: Distributed sampling from intractable distributions." Submitted For Review, 2023. Available at arXiv:2308.09769

* *denotes equal author contribution (shared first-authorship).*

Peer-reviewed publications

[1] Fabian Falck*, Christopher Williams*, George Deligiannidis, Chris Holmes, Arnaud Doucet, and **Saifuddin Syed**. "A Unified Framework for U-Net Design and Analysis." To appear in Advances in Neural Information Processing Systems, 2023, **(26.1% acceptance)**. Available at arXiv:2305.19638.

[2] Trevor Campbell, **Saifuddin Syed**, Chiao-Yu Yang, Michael I. Jordan, and Tamara Broderick. "Local exchangeability." Bernoulli 29(3), 2084–2100, 2023. Available at arXiv:1906.09507.

[3] Nikola Surjanovic, **Saifuddin Syed**, Trevor Campbell, and Alexandre Bouchard-Côté. "Parallel tempering with a variational reference." Advances in Neural Information Processing Systems, 2022 **(25.6% acceptance)**. Available at arXiv:2206.00080.

[4] **Saifuddin Syed**, Alexandre Bouchard-Côté, George Deligiannidis, and Arnaud Doucet. "Non-reversible parallel tempering: a scalable highly parallel MCMC scheme." Journal of the Royal Statistical Society (Series B) 84(2), 321–350, 2022. Available at arXiv:1905.02939.

[5] **Saifuddin Syed***, Vittorio Romaniello*, Trevor Campbell, and Alexandre Bouchard-Côté. "Parallel tempering on optimized paths." International Conference on Machine Learning, 2021 **(21.5% acceptance)**. Available at arXiv:2102.07720.

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Prizes, Scholarships and other Honours

2023	ISBA Savage Award: Theory and Methods (Honourable Mention). *Doctoral thesis award from the International Society for Bayesian Analysis.*
2023	CAIMS Cecil Graham Doctoral Dissertation Award. *Doctoral thesis award from the Canadian Applied and Industrial Mathematics Society.*
2023	SSC Pierre Robillard Award. *Doctoral thesis award from the Statistical Society of Canada.*
2023 – 2026	Florence Nightingale Bicentennial Fellowship.
2023 – 2025	NSERC Postdoctoral Fellowship.
2021	Marshall Prize. *Research award issued by UBC Department of Statistics.*
2017 – 2021	UBC Four Year Fellowship.
2020	NeurIPS Top Reviewer (Top 10%).
2017 – 2020	NSERC Canada Graduate Scholarship Doctorate Award (CGS-D).
2017 – 2020	UBC Faculty of Science Graduate Award.
2017	Anona Thorne and Takao Tanabe Graduate Entrance Scholarship.
2015 – 2016	NSERC Alexander Graham Bell Canada Graduate Scholarship (CGS-M).
2010 – 2014	Queen Elizabeth II Aiming for the Top Scholarship.
2010 – 2014	University of Waterloo Math Faculty Dean's Honours List.
2013	NSERC Undergraduate Student Research Award (USRA).
2011	University of Waterloo Research Award.
2011	University of Waterloo President's Scholarship.

Supervision

2023 –	**Fabian Falck**, *DPhil Statistics 4th year, University of Oxford.* Co-supervised with Arnaud Doucet and Chris Holmes. Topic: probabilistic deep generative modelling applied to medicine, biology and the sciences more broadly.

2023 –   **Chris Williams**, *DPhil Statistics 2nd year, University of Oxford.*
Co-supervised with Arnaud Doucet and George Deligiannidis.
Topic: Quantification of statistical annealing algorithms with application to algorithm design in sampling methods and generative modelling.

2023 –   **Amitis Shidani**, *DPhil Statistics 2nd year, University of Oxford.*
Co-supervised with Arnaud Doucet and George Deligiannidis.
Topic: Representation learning through the lens of mutual information and distribution matching.

Teaching Experience

2024 –   **Lecturer**. *University of Oxford, Department of Statistics.*
Advanced Simulation Methods, Oxford Statistics MSc and Part C.
16 hours of lectures and 4 hours of tutorial.
Duties: Lecturing, managing TA's, students, office hours, grading, writing exam.

2022   **Teaching Assistant**. *University of Oxford, Sommerville College.*
M3 Probability, Prelim probability for a general audience.

2018 – 2021 **Teaching Assistant**. *University of British Columbia, Department of Statistics.*
STAT 547C, Topics in probability for statistics.
Duties: Office hours, grading, and guest lectures.

2015 – 2016 **Recitation Instructor**. *University of British Columbia, Department of Mathematics.*
MATH 100V/101V, Differential/Integral Calculus (Vantage College).
Approximately 25 students, 24 hours of instruction per term for 2 terms.
Duties: lecturing, managing office hours, and 4 teaching assistants.

2015   **Instructor**. *University of British Columbia, Department of Mathematics.*
MATH 105, Integral calculus for commerce and social sciences.
Approximately 80 students, 36 hours of instruction.
Duties: lecturing, creating assignments, managing office hours, a teaching assistant.

2015   **Workshop Instructor**. *Beat Your Course Inc.*
Led exam review workshops in differential equations, and multivariate calculus.

2014 – 2015 **Instructor**. *BrainBoost Education.*
Taught Grade 5-12 students with learning disabilities (e.g. autism, dyslexia, etc).

2014   **Teaching Assistant**. *University of British Columbia, Department of Mathematics.*
MATH 220, Mathematical proof.
Math learning centre tutor.

Relevant Experience and Service

2023 –   **Departmental Committee**. *Department of Statistics, University of Oxford.*
Member of research strategy committee.

2023 –   **Seminar Organizer**. *OxCSML seminar, Univeristy of Oxford.*
Weekly seminar series for computational statistics and machine learning group.

2023   **Reviewer**. *Artificial Intelligence and Statistics Conference (AISTATS).*

2023   **Workshop Organizer**. *CoSInES + Bayes4Health, University of Warick.*
"Optimal transport masterclass."
Goal: Outline recent research using optimal transport for Monte Carlo methods.

2022   **Seminar Organizer**. *CoSInES seminar.*
Bi-weekly seminar series to showcase international computational statistics research.

2020, 2022   **Reviewer**. *Statistics and Computing.*

2022   **Note Taker**. *University of Oxford, Sommerville College.*
Interviewing prospective undergraduate students for admission to Somerville College.

2020	**Reviewer**. *Biometrika.*
2020	**Reviewer**. *Conference on Neural Information Processing Systems (NeurIPS).*
2018	**Reviewer**. *Association for Uncertainty in Artificial Intelligence (UAI).*
2012 – 2014	**General Manager & Co-editor-in-chief**. *Waterloo Math Review (WMR).* The WMR was a Canada-wide journal to showcase undergraduate math research. Duties: Manage submissions, reviewers, design journal, and distribute across Canada.
2013	**Research Assistant**. *University of Waterloo, Department of Pure Mathematics.* Supervised by Spiro Karigiannis.
2012	**Actuarial Analyst Intern**. *Desjardins General Insurance Group.* Completed P/1 and FM/2 exams from the Society of Actuaries.
2011	**Research Assistant**. *University of Waterloo, Department of Pure Mathematics.* Supervised by Kevin Hare.

NOTABLE TALKS

2024	**University of College London Department of Statistics**. *London, UK.* (Upcoming Invited Seminar, January 2024).
2023	**University of Warick Department of Statistics**. *Warick, UK.* (Upcoming Invited Seminar, November 2023).
	Imperial College London Department of Statistics. *London, UK.* (Upcoming Invited Seminar, November 2023).
	King's College London Department of Statistics. *London, UK.* (Upcoming Invited Seminar, November 2023).
	Imperial College London School of Public Health. *London, UK.* (Upcoming Invited Seminar, October 2023).
	European Young Statisticians Meeting 2023. *Ljubljana, Slovenia.* (Invited Conference) Representative from the UK.
	JSM 2023. *Toronto, Canada.* (Invited Conference) "ISBA Savage Award Finalist: Theory and Methods."
	SMC Down Under Workshop. *Brisbane, Australia.* (Plenary Keynote) "Annealed sequential Monte Carlo samplers."
	CAIMS 2023 Annual Meeting. *Fredericton, Canada.* (Plenary Keynote) "Cecil Graham Doctoral Dissertation Award lecture."
	SSC Annual Meeeting 2023. *Ottawa, Canada.* (Plenary Keynote) "Pierre Robillard Award lecture."
	Heilbronn Cybersecurity Workshop. *Bristol, UK.* (Invited Conference) "Parallel tempering on optimized paths."
	Univerity of College London Statistics Seminar. *London, UK.* (Invited Seminar) "Parallel tempering on optimized paths."
	Bayes4Health & CoSInES Workshop. *Oxford, UK.* (Invited Conference) "Annealing algorithms."
	BayesComp 2023. *Levi, Finland.* (Upcoming Invited Conference) "Parallel tempering on optimized paths."
	Johns Hopkins Biostats Seminar. *Remote.* (Invited Seminar) "Non-reversible parallel tempering."
2022	**CMStatistics 2022**. *London, UK.* (Invited Conference) "Parallel tempering with a variational reference."

NeurIPS 2022. *New Orleans, USA.*
(Invited Poster) "Parallel tempering with a variational reference."

Harvard University Black Hole Initiative. *Cambridge, United States.*
(Invited Seminar) "Non-reversible parallel tempering and the EHT."

ISBA 2022 World Meeting. *Montreal, Canada.*
(Invited Conference) "Non-reversible parallel tempering."

University of Montreal Department of Statistics. *Montreal, Canada.*
(Invited Seminar) "Non-reversible parallel tempering on optimized paths."

University of Oxford OxCSML Seminar. *Oxford, UK.*
(Invited Seminar) "Non-reversible parallel tempering on optimized paths."

CoSInES Seminar. *Remote.*
(Invited Seminar) "Non-reversible parallel tempering."

Queensland University of Technology. *Remote.*
(Invited Seminar) "Non-reversible parallel tempering on optimized paths."

UBC Department of Statistics. *Remote.*
(Invited Seminar) "Non-reversible parallel tempering on optimized paths."

Simon Fraser University Department of Statistics. *Burnaby, Canada.*
(Invited Seminar) "Non-reversible parallel tempering on optimized paths."

2021   **MCM 2021**. *Remote.*
(Contributed Conference) "Parallel tempering on optimized paths."

ICML 2021. *Remote.*
(Invited Poster) "Parallel tempering on optimized paths."

ISBA 2021 World Meeting. *Remote.*
(Contributed Conference) "Parallel tempering on optimized paths."

Riskfuel Analytics Inc. *Remote.*
(Invited Seminar) "Parallel tempering on optimized paths."

2020   **CAIDA: BC's AI Showcase**. *Remote.*
(Contributed Poster) "Non-reversible parallel tempering."

MURI Seminar. *Remote.*
(Invited Seminar) "Non-reversible parallel tempering."

2019   **University of Bristol Department of Mathematics**. *Bristol, UK.*
(Invited Seminar) "Non-reversible parallel tempering: scaling and optimality."

CMStatistics 2019. *London, UK.*
(Invited Conference) "Non-reversible parallel tempering."

University of Oxford OxCSML Seminar. *Oxford, UK.*
(Invited Seminar) "Non-reversible parallel tempering."

MCM 2019. *Sydney, Australia.*
(Invited Conference) "Non-reversible parallel tempering: scaling and optimality."

1QBit Information Technologies Inc. *Vancouver, Canada.*
(Invited Seminar) "Non-reversible parallel tempering: scaling and optimality."

Microsoft Research. *Redmond, USA.*
(Invited Seminar) "Optimal scaling of parallel tempering."