Siu Lun Chau

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Current Position

Postdoctoral Researcher, CISPA Helmholtz Center for Information Security, Germany 2023-2025
- Advisor: Krikamol Muandet

Research Interests

- Cooperative game theory
- Uncertainty modelling
- Explainable AI
- Causal Inference and Econometrics
- Kernel methods and Gaussian Processes
- Ranking and Preference learning

Education

DPhil in Statistical Science, University of Oxford, UK 2018-2023
- Thesis: *"Towards Trustworthy Machine Learning with Kernels"*
- Supervisor: Dino Sejdinovic, Mihai Cucuringu, Xiaowen Dong

MMATH in Mathematics and Statistics, University of Oxford, UK 2014-2018
- First Class Honors, ranked 2^{nd} in 4^{th} year and 1^{st} in 3^{rd} year.

Work Experience

Visiting Researcher, University of Adelaide, Australia 2023
- Advisor: Dino Sejdinovic

Postdoctoral Researcher, CISPA Helmholtz Center for Information Security, Germany 2023-2025
- Advisor: Krikamol Muandet

Data Scientist, Ravio (HR Tech startup), UK 2023
- Developed a tree-based quantile regressor with monotonic constraints for compensation modelling
- Utilised pre-trained language models to align heterogeneous job titles across industry

Applied Scientists Intern, Amazon, UK 2022
- Developed deep coherent probabilistic demand forecasts for logistic optimisation
- Produced research best practice and software developement guidelines for the applied science team.

Visiting Researcher, Max Planck Institute of Intelligent System, Germany 2021-2022
- Advisor: Krikamol Muandet
- Researched into relaxing assumptions in instrumental variable regression and examined non-parametric testing framework for regression discontinuity design.

Data Science Consultant, Catalyst AI, UK 2019-2021
- Built statistical models on crop yield data for an agricultural tech startup.
- Built demand forecasting models to predict pre-markdown sales for a fashion retail company.

Preprints

Masaki Adachi, Sebastian B. Orbell, Brady Planden, Natalia Ares, David A. Howey, Krikamol Maundet, Michael A. Osborne, **Siu Lun Chau** *"Looping in the human: Collaborative and Explainable Bayesian Optimisation"* To appear.

Kiet Vo, Muneeb Aadil, **Siu Lun Chau**, Krikamol Muandet *"Causal Strategic Learning with Competitive Selection"* arXiv preprint arXiv:2308.16262 (2023).

Publications

Siu Lun Chau, Krikamol Muandet*, Dino Sejdinovic*. (* denotes equal contributions) *"Explaining the Uncertain: Stochastic Shapley Values for Gaussian Process Models."* To appear in Advances in Neural Information Processing Systems 36 (NeurIPS) 2023. (Spotlight paper)

Simon Föll*, Alina Dubatovka*, Eugen Ernst†, **Siu Lun Chau**†, Martin Maritsch, Patrik Okanovic, Gudrun Thäter, Joachim M. Buhmann, Felix Wortmann, Krikamol Muandet. († denotes equal contributions) *"Gated domain units for multi-source domain generalization."* To appear in Transactions of Machine Learning Research (TMLR) 2023.

Siu Lun Chau, Robert Hu, Javier Gonzalez, and Dino Sejdinovic. *"RKHS-SHAP: Shapley values for kernel methods."* Advances in Neural Information Processing Systems 35 (NeurIPS) 2022.

Robert Hu*, **Siu Lun Chau***, Jaime Ferrando Huertas, Dino Sejdinovic. (* denotes equal contributions) *"Explaining Preferences with Shapley Values."* Advances in Neural Information Processing Systems 35 (NeurIPS) 2022.

Robert Hu, **Siu Lun Chau**, Dino Sejdinovic, and Joan Glaunès. *"Giga-scale Kernel Matrix-Vector Multiplication on GPU."* Advances in Neural Information Processing Systems 35 (NeurIPS) 2022

Siu Lun Chau, Mihai Cucuringu, Dino Sejdinovic, *"Spectral Ranking with Covariates"*, European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML PKDD) 2022

Siu Lun Chau, Javier Gonzalez, Dino Sejdinovic, *"Learning Inconsistent Preference with Gaussian Processes"*, International Conference on Artificial Intelligence and Statistics (AISTATS) 2022

Siu Lun Chau*, Jean Francois Ton*, Yee Whye Teh, Javier Gonzalez, Dino Sejdinovic (* denotes equal contributions) *"BayesIMP: Uncertainty Quantification for Causal Data Fusion"*, Advances in Neural Information Processing Systems 34 (NeurIPS) 2021

Siu Lun Chau*, Shahine Bouabid*, Dino Sejdinovic (* denotes equal contributions) *"Deconditional Downscaling with Gaussian Processes"*, Advances in Neural Information Processing Systems 34 (NeurIPS) 2021

Xingyue Pu, **Siu Lun Chau**, Xiaowen Dong, Dino Sejdinovic, *"Kernel-based Graph Learning from Smooth Signals: A Functional viewpoint"*, IEEE Transactions on Signal and Information Processing over Networks (IEEE) 2020

Invited Talks

Department of Management, Technology, and Economics at ETH Zurich 2023
- *"Explaining the uncertain: Stochastic Shapley values for Gaussian process models"*

ETH AI Center 2023
- *"Explaining the uncertain: Stochastic Shapley values for Gaussian process models"*

Oxford-Man Institute 2023
- *"Explaining the uncertain: Stochastic Shapley values for Gaussian process models"*

CISPA Helmholtz Center for Information Security 2023
- *"Explaining Kernel methods and preference models with RKHS-SHAP"*

Oxford Strategty Group Digital 2023
- *"Introduction to Explainable ML"*

ECML PKDD 2022
- *"Spectral Ranking with Covariates"*

ELISE Theory Workshop on ML Fundamentals at Eurecom 2022
- *"Explainability for Kernel methods"*

S-DCE Alan Turing Institute Seminar 2022
- *"Deconditional Gaussian process"*

UCL Gatsby Unit 2022
- *"Explaining kernel methods with RKHS-SHAP"*

UCL Statistical Machine Learning Group 2022
- *"Deconditional downscaling with Gaussian processes"*

Imperial & Oxford StatML Seminar 2022
- *"Shapley values for model explanations"*

Warwick ML Group 2021
- *"Uncertainty quantification for causal data fusion"*

Research Funding & Awards

Helmholtz Association (Postdoc funding)	2023
ESPRC and MRC Studentship for DPhil in Statistics and Machine Learning	2018-2023
St.Peter's College, University of Oxford Travel Award	2018
Department Prize for FHS Mathematics and Statistics Part B (Top of the year)	2017

Supervision Experience

Master's Student

Oscar Yung (University of Oxford) 2022
- Thesis: *"Two Sample Testing for Regression Discontinuity Design"*

Samuel Weinman (University of Oxford) 2020
- Thesis: *"Analysis of Price-Volume Interplay in Financial Markets via Machine Learning"*

Undergraduate Students

Mohammad Mojarradi, Jihong Lee, William Conyers, Daniel Park (William's College) 2020-2021
- Williams-Exeter Exchange Program at Oxford University

Teaching Experience

University of Oxford

Tutor, SB2.2 Statistical Machine Learning	2021
Tutor, SB1.2 Computational Statistics	2020
Tutor, SB1.1 Applied Statistics	2020
Tutor, A12 Simulation and Statistical Programming	2020
Teaching Assistant, SB2.1 Foundations of Statistical Inference	2019

Reviewer Service

NeurIPS	2021, 2022, 2023
ICML	2022
AISTATS	2022
ECML PKDD	2022
IEEE	2021