

RESEARCH INTERESTS

My research spans algorithms, theory and applications of statistical inference and machine learning.

- **Machine learning for healthcare applications:** Survival analysis with competing risks and in dynamic settings, modelling of electronic health records for prediction problems.
- **Causal inference and discovery:** Causal discovery in dynamic and high-dimensional settings, Treatment effect estimation.
- **Hypothesis testing** with a focus on high-dimensional feature spaces, time series and biased data.

EXPERIENCE

Postdoctoral Research Scientist

Columbia University

Jun 2021 - Present, New York, U.S.A.

- Advisor: Prof. Elias Bareinboim

SKILLS

Coding

Python R

Awards

Best Abstract AIMED conference, 2019.

G-Research PhD Competition Prize, 2019

PhD studentship Alan Turing Institute, 2018

Languages

Spanish (native)

French (native)

Luxembourgish (native)

English (native)

German (conversational)

EDUCATION

Ph.D. Applied Mathematics

University of Cambridge / Alan Turing Institute

2017 - 2021, Cambridge, UK

- Thesis title: Hypothesis Testing and Causal Inference with Heterogeneous Medical Data.
- Advisor: Prof. Mihaela van der Schaar.

M.Sc. Applied Statistics

University of Oxford

2016 - 2017, Oxford, UK

- Grade: Distinction.
- Courses in Graphical Models, Applied Statistics, Foundations of Statistical Inference, Bayes Methods, Computational Statistics.

B.Sc. Mathematics

Imperial College London

2013 - 2016, London, UK

- Grade: First Class Honours.
- Courses in all areas of Mathematics with a specialization in Statistics.

PUBLICATIONS

Working papers

- T. Kyono, Y. Zhang, **A. Bellot**, M. van der Schaar, "MIRACLE: Causal Structure Learning and Exploitation for Imputing Missing Data".
- **A. Bellot**, M. van der Schaar, "Consistency of mechanistic causality in continuous-time using Neural ODEs".
- **A. Bellot**, M. van der Schaar, "Scoring DAGs with Dense Unobserved Confounding".
- **A. Bellot**, M. van der Schaar, "Accounting for Unobserved Confounding in Domain Generalization".

Conference papers

- **A. Bellot**, M. van der Schaar, "Policy Analysis using Synthetic Controls in Continuous-time", ICML, 2021.
- **A. Bellot**, M. van der Schaar, "Application of Kernel Hypothesis Testing on Set-valued Data", UAI, 2021
- **A. Bellot**, M. van der Schaar, "A Kernel Two-Sample Test with Selection Bias", UAI, 2021.
- **A. Bellot**, R. A. Floto, M. van der Schaar, "AI-based Hypothesis Testing in Individuals with CF", Pediatric Pulmonology (Abstract), 2020.
- Y. Zhang, **A. Bellot**, M. van der Schaar, "Learning Overlapping Representations for the Estimation of Individualized Treatment Effects", AISTATS, 2020.
- Z. Qian, A. Alaa, **A. Bellot**, M. van der Schaar, "Learning Dynamic and Personalized Comorbidity Networks from Event Data using DeepDiffusion Processes", AISTATS, 2020.
- **A. Bellot**, M. van der Schaar, "Conditional Independence Testing using Generative Adversarial Networks", NeurIPS, 2019.
- **A. Bellot**, M. van der Schaar, "Boosting Transfer Learning with Survival Data from Heterogenous Domains", AISTATS, 2019.
- **A. Bellot**, M. van der Schaar, "Multitask Boosting for Survival Analysis with Competing Risks", NeurIPS, 2018.
- **A. Bellot**, M. van der Schaar, "Boosted Trees for Risk Prognosis", Machine Learning for Healthcare Conference (MLHC), 2018.
- **A. Bellot**, M. van der Schaar, "Tree-based Bayesian Mixture Model for Competing Risks", AISTATS, 2018.

Journal papers

- T. Cowling, D. Cromwell, **A. Bellot**, and others. "Logistic regression and machine learning predicted patient mortality from large sets of diagnosis codes comparably", Journal of Clinical Epidemiology, 2020.
- T. Cowling, **A. Bellot**, and others. "One-year mortality of colorectal cancer patients: development and validation of a prediction model using linked national electronic data", British Journal of Cancer, 2020.
- Y. Ruan, **A. Bellot**, and others. "Predicting the Risk of Inpatient Hypoglycemia With Machine Learning Using Electronic Health Records", Diabetes Care, 2020.
- **A. Bellot**, M. van der Schaar, "A Bayesian Approach to Modelling Longitudinal data", ACM Computing for Healthcare, 2020.
- **A. Bellot**, M. van der Schaar, "A Hierarchical Bayesian Model for Personalized Survival Predictions", IEEE J. BHI, 2018.

INVITED TALKS

Inspiration exchange Cambridge	Policy Analysis using Synthetic Controls in Continuous-time	2021
Ellis Health Foundation	Accounting for unobserved confounding in domain generalization	2020
Microsoft Research	Conditional Independence Testing using Generative Adversarial Networks	2020
GlaxoSmithKline	Conditional Independence Testing using Generative Adversarial Networks	2020

TEACHING EXPERIENCE

Teaching Assistant - Causal Inference 1 (COMS 4775)	2021
Personal Tutor - High School Mathematics and Physics	2016
Personal Tutor - High School Mathematics and Physics	2015

ACADEMIC SERVICE

Program Committee member

Causal Inference Challenges in Sequential Decision Making: Bridging Theory and Practice workshop, Causal Inference & Machine Learning: Why now? Workshop, NeurIPS, ICML, AAAI Symposium on Survival Prediction: Algorithms, Challenges, and Applications, ACM Transactions on Information Systems.	2021
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NeurIPS, ICLR, AISTATS, ACM Transactions on Intelligent Systems and Technology.	2020
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Organizing

Causal Inference & Machine Learning: Why now? Workshop, Neurips	2021
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