

Arthur Chatton

PHD BIOSTATISTICS · FACULTÉ DE PHARMACIE, UNIVERSITÉ DE MONTRÉAL

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Education

Université de Nantes

Nantes, France

PHD BIOSTATISTICS

2019 - 2021

- Advisors: Dr. Yohann Foucher, Dr. Florent Le Borgne
- Dissertation: “Counterfactual prediction in causal estimation: Comparisons by simulations”, defended the 13/12/2021.
- Committee: Pr. Cécile Proust-Lima (Université de Bordeaux - INSERM), Pr. Raphael Porcher (Université de Paris), Pr. Julie Josse (INRIA), Pr. Anne-Laure Boulesteix (Ludwig-Maximilian University of Munich)

Université de Nantes

Nantes, France

MSc BIOSTATISTICS, with Merit

2016 - 2018

- Minor in Epidemiology
- Thesis: “G-computation and propensity score-based methods: a simulation study”
- Committee: Pr. Emmanuel Oger (Université de Rennes), Dr. Etienne Dantan (Université de Nantes), Dr. Nathalie Costet (Université de Rennes)

Université de Nantes

Nantes, France

BSc BIOLOGY, Upper Second-Class Honours, *magna cum laude*

2012 - 2016

Research Experience

Postdoctoral Researcher at Université de Montréal

Montréal, Canada

ADVISORS: DR. MIREILLE SCHNITZER, PR. ROBERT PLATT

Aug. 2022 - Aug. 2024

- Keywords: Causal inference, Dynamic prediction, Longitudinal data, Machine learning
- IVADO postdoctoral fellowship
- Project 1: Dynamic super learning for optimizing hemodiafiltration session
- Project 2: Decision trees for checking the sequential positivity assumption
- Advisor of two BSc and one Pharm.D. students (4 months each)
- Oral presentation at three international conference and invited presentation at four national conferences

Doctoral Researcher at UMR INSERM 1246 SPHERE, Université de Nantes

Nantes, France

ADVISORS: DR. YOHANN FOUCHER, DR. FLORENT LE BORGNE

Jan. 2018 - Dec. 2021

- Keywords: Causal inference, G-methods, Positivity, Simulation study, Survival analysis
- Awarded best thesis by the French Biometrical Society
- Advisor of an MSc student (6 months) which yields one publication
- Oral presentations at three international and four national conferences
- Contributions to the R package RISCA and creation of RShiny applications

Research Assistant at UMR INSERM 1246 SPHERE, Université de Nantes

Nantes, France

ADVISOR: DR. YOHANN FOUCHER

Sep. 2018 - Dec. 2018

Intern at UMR INSERM 1246 SPHERE, Université de Nantes

Nantes, France

ADVISORS: DR. YOHANN FOUCHER, PR. DAVID LAPLAUD

Mar. 2017 - Sep. 2017

- Keywords: Bootstrap, Causal inference, Predictive score, Simulation study
- Oral presentation at a national conference

Intern at UMR INSERM 1235 IMAD, Université de Nantes

Nantes, France

SUPERVISORS: DR. ÉMILIE DUCHALAIS, DR. LAURIANNE VAN LANDEGHEM

Sep. 2015 - Jun 2016

- Project: Neurogenesis in colorectal cancer.










Awards, Fellowships, & Grants

2024	Postdoctoral Research Funding, CRM STATLAB – CANSSI (link)	\$CAD 42,000
2023	Daniel Schwartz prize for the best PhD thesis, French Biometrical Society (link)	€ 500
2022	Postdoctoral Research Funding, IVADO (link)	\$CAD 70,000
2022	Ericsson Award for the best Flash presentation, IVADO (link)	\$CAD 500


Publications

* co-first authors; † mentored student. Clickable links:  Open access,  Paywall,  Pre-print

PUBLISHED

- Chatton A** and Rohrer JM. The causal cookbook: recipes for propensity score, g-computation and doubly robust standardisation. *Accepted in Advances in Methods and Practices in Psychological Science* 
- Danelian G[†], Le Borgne F, Léger M, Foucher Y, and **Chatton A**. Identification of in-sample positivity violations using regression trees: the PoRT algorithm (2023). *Journal of Causal Inference*, 11(1):20220032
- Chatton A**, Le Borgne F, Leyrat C, and Foucher Y. G-computation and doubly robust standardisation for continuous-time data: a comparison with inverse probability weighting (2022). *Statistical Methods in Medical Research*, Apr;31(4):706-718  
- Chatton A**, Le Borgne F, Leyrat C, Gillaizeau F, Rousseau C, Barbin L, *et al.* G-computation, propensity score-based methods, and targeted maximum likelihood estimator for causal inference with different covariates sets: a comparative simulation study (2020). *Scientific Reports*, Jun;10(1):9219. 
- Chatton A**^{*}, Le Borgne F^{*}, Léger M, Lenain R, and Foucher Y. G-computation and machine learning for estimating the causal effects of binary exposure statuses on binary outcomes (2021). *Scientific Reports*, Jan;11(1):1435 
- Léger M, **Chatton A**, Le Borgne F, Pirracchio R, Lasocki S, and Foucher Y. Causal inference in case of near-violation of positivity: comparison of methods (2022). *Biometrical Journal*, Dec;64(8):1389-1403 
- Lejeune F, **Chatton A**, Laplaud D-A, Le Page E, Wiertelowski S, Edan G, *et al.* SMILE: a predictive model for Scoring the severity of relapses in Multiple sclErosis (2021). *Journal of Neurology*, Feb;268(2):669–679. 
- Haber NA, Wieten SE, Rohrer JM, ..., **Chatton A** *et al.* Causal and Associational Linking Language From Observational Research and Health Evaluation Literature in Practice: A systematic language evaluation (2022). *American Journal of Epidemiology*, Dec;191(12):2084-2097 
- Féray C, Taupin J-L, Sebah M, ..., **Chatton A**, *et al.* Donor HLA Class 1 Evolutionary Divergence Is a Major Predictor of Liver Allograft Rejection (2021). *Annals of Internal Medicine*, Oct;174(10):1385-1394 

IN PROGRESS

- Chatton A**, Bally M, Lévesque R, Malenica, I, Platt RW, and Schnitzer ME. Personalised dynamic super learning: an application in predicting convection volumes in hemodiafiltration. *Submitted in Journal of the Royal Statistical Society, Series C* 
- Chatton A**, Assob Feugo K[†], Pilote E[†], Cardinal H, Platt RW, and Schnitzer ME. A Canado-European geographical and temporal external validation of the Kidney Transplant Failure Score. *In writing*
- Chatton A**, Pilote E[†], Assob Feugo K[†], Platt RW, and Schnitzer ME. Ten years later, what if we used a super learner instead of a Cox model to build a prognostic score? *In writing*
- Chatton A**, Schomaker M, Luque-Fernandez M-A, Platt RW, and Schnitzer ME. Is checking for sequential positivity violations getting you down? Try sPoRT! *In writing*

Presentations

INVITED TALKS

- Spring 2024. *Sequential positivity checking for longitudinal causal inference*. 2024 Statistical Society Canada Annual Meeting, St. John's, Newfoundland, Canada.

Spring 2024. *Personalised dynamic super learning: an application in predicting hemodiafiltration's convection volumes*. 2024 Sixth International Chinese Statistical Association - Canada Chapter Symposium, Niagara Falls, Canada.

Winter 2024. *Super learning for dynamic and personalized prediction*. Epidemiology Seminars: Department of Epidemiology, Biostatistics and Occupational Health at the McGill School of Population and Global Health, Montréal, Canada.

Winter 2024. *Clustered super learning for improving the transportability of causal inferences*. Departmental colloquium: Department of Mathematics and Statistics, Ottawa University, Ottawa, Canada.

Fall 2023. *Personalised dynamic prediction in dialysis using a novel super learning framework*. Centre for Clinical Epidemiology's Seminar Series, Lady Davis Institute for Medical Research, Montréal, Canada.

Winter 2023. *G-computation and doubly robust standardisation for causal survival analysis*. Invited talk: Journée Jeunes Chercheurs en biométrie, Daniel Schwartz's prize winner, from the French Biometrical Society, Rennes, France.

Winter 2023. *How to be positive or the search for identifiability*. Departmental seminar: Biostatistical team Bordeaux Population Health center, Bordeaux, France

Fall 2022. *The place of machine learning in causal inference: Illustration with a public/private partnership*. Artificial intelligence and data mining in health research 2022, from the Cardiometabolic Health, Diabetes and Obesity Research Network, Montréal, Canada.

Summer 2021. *G-computation and propensity score*. Séminaire "Méthodes de l'approche causale en épidémiologie", Rennes, France.

CONTRIBUTED ORAL PRESENTATIONS

Chatton A, Bally M, Lévesque R, Malenica I, Platt RW, Schnitzer ME. How to check the sequential positivity assumption without propensity scores? *2024 Society for Epidemiologic Research Annual Conference*, 18-21 June 2024, Austin, TX, USA.

Chatton A, Schomaker M, Luque-Fernandez M-A, Platt RW, Schnitzer ME. Personalized dynamic prediction in dialysis using a novel super learning framework. *2024 Society for Epidemiologic Research Annual Conference*, 18-21 June 2024, Austin, TX, USA.

Chatton A, Danelian G, Le Borgne F, Léger M, Foucher Y. Identifying individuals causing positivity violations as missing exclusion criteria: a decision trees-based algorithm. *2023 Society for Epidemiologic Research Annual Conference*, 13-16 June 2023, Portland, OR, USA.

Chatton A, Le Borgne F, Léger M, Lenain R, Foucher Y. Machine learning, G-computation and small sample sizes: a simulation study. *42nd Conference of the International Society for Clinical Biostatistics*, 18-22 July 2021, Lyon, France (online).

Chatton A, Le Borgne F, Foucher Y. G-computation and machine learning for causal inference. *The 8th Channel Network Conference*, 7-9 April 2021, Paris, France (online).

Chatton A, Le Borgne F, Leyrat C, Foucher Y. G-computation and Inverse Probability Weighting for time-to-event analyses. *41st Annual Conference of the International Society of Clinical Biostatistics*, 23-27 August 2020, Kraków, Poland (online).

Chatton A, Le Borgne F, Léger M, Lenain R, Foucher Y. G-computation et intelligence artificielle en inférence causale. *15^{ème} Conférence Francophone d'Épidémiologie CLINique et 28^{èmes} journées des Statisticiens des Centre de Lutte Contre le Cancer*, 8-11 June 2021, Marseille, France.

Chatton A, Le Borgne F, Leyrat C, Foucher Y. G-computation et pondération sur le score de propension en analyse de survie. *14^{ème} Conférence Francophone d'Épidémiologie CLINique et 27^{èmes} journées des Statisticiens des Centre de Lutte Contre le Cancer*, 15-16 September 2020, Angers, France (online).

Chatton A, Le Borgne F, Leyrat C, Foucher Y. G-computation et Inverse-Probability-Weighting en analyse de survie. *Journées 2019 du GDR "Statistiques & Santé", de la Société Française de Biométrie et du groupe "Biopharmacie" de la Société Française de Statistique*, 10-11 October 2019, Paris, France.

Chatton A, Le Borgne F, Gillaizeau F, et al.. La G-computation et les méthodes basées sur la théorie du score de propension dans le cadre d'un critère de jugement binaire : une étude comparative afin d'évaluer leurs performances. *Journées 2018 du GDR "Statistique & Santé" et de la Société Française de Biométrie*. 27-28 September 2018, Nantes, France.

CONTRIBUTED POSTER PRESENTATIONS

Chatton A, Pilote E, Assob Feugo K, Platt RW, Schnitzer ME. Ten years later, what if we used a super learner instead of a Cox model to build a prognostic score? *2024 Society for Epidemiologic Research Annual Conference*, 18-21 June 2024, Austin, TX, USA.

SEMINARS & WORKSHOPS

Chatton A, Bally M, Levesque R, Malenica I, Platt RW, Schnitzer ME. AI for optimizing dialysis through personalized dynamic predictions. IVADO's annual seminar: Digital Futures 2024, Montréal, Canada.

Chatton A, Bally M, Levesque R, Malenica I, Platt RW, Schnitzer ME. Personalized dynamic super learning. CANSSI Showcase 2023, Online, Canada, 2023

Chatton A, Bally M, Levesque R, Platt RW, Schnitzer ME. Personalized dynamic super learning. CANSSI Quebec 1st Postdoctoral day, Montreal, QC, Canada, 2023

Chatton A. Dialysis in the digital area: prediction and adaptation in real time. IVADO's annual seminar: Digital October 2023, Montréal, Canada. **Ericsson Award for the best Flash presentations**

Chatton A. Introduction to causal diagrams. Departmental seminar: UMR INSERM 1246 SPHERE, Nantes, France, 2020

Chatton A. G-computation for time-to-event outcomes. Departmental seminar: UMR INSERM 1246 SPHERE, Nantes, France, 2019

Chatton A. G-computation for time-to-event outcomes. Departmental seminar: Pharmacy department, Université de Nantes, France, 2019

Chatton A. G-computation for time-to-event outcomes. Departmental seminar: Doctoral school, Université de Nantes, France, 2019

Teaching Experience

Winter 2024	Lecturer , Courses: Causal Inference (PHM6078/7078; 3h) 6 PhD students.	<i>U. Montréal</i>
Winter 2024	Teaching Fellow , Course: Introduction to Biostatistics (MSO 6061; 45h). 50 MSc and PhD students. Lectures, practicum and evaluation.	<i>U. Montréal</i>
Spring 2020	Teaching Fellow , Courses: Big data (20,5h), Missing data and Small samples analysis (11,5h). 20-40 MSc students. Lectures, practicum and evaluation.	<i>Univ. Nantes</i>
Fall 2020	Lecturer , Course: Clinical epidemiology (3h), Introduction to Biostatistics (20h). 20-40 MSc students.	<i>Univ. Nantes</i>
Spring 2019	Teaching Fellow , Courses: Big data (21,5h), Missing data and Small samples analysis (9,5h). 20-40 MSc students. Lectures, practicum and evaluation.	<i>Univ. Nantes</i>
Fall 2019	Teaching Fellow , Courses: Biomathematics (6h), Introduction to Biostatistics (20h). 20-40 MSc students. Lectures, practicum and evaluation.	<i>Univ. Nantes</i>

Mentoring

SUPERVISION

- Summer 2024 **Mary-Anne Ke**, Pharm.D. student (1st cycle), 4 months internship (without thesis), Université de Montréal, Canada
- Winter 2024 **Emilie Pilote**, BSc Student in Pharmaceutical Science, 4 months internship (with thesis), Université de Montréal, Canada
- Summer 2023 **Kevin Assob Feugo**, BSc Student in Pharmaceutical Science, 4 months internship (without thesis), Université de Montréal, Canada
- Spring 2021 **Danelian Gabriel**, MSc Student in Data Science, 6 months internship (with thesis), Université de Lille, France

COMMITTEE

- 2021 **Brier Mathis**, MSc in Biostatistics, defence rapporteur & chair. *Univ. Nantes*
- 2021 **Gerbaud Alexandre**, MSc in Epidemiology, defence rapporteur. *Univ. Rennes*
- 2021 **Balusson Frédéric**, MSc in Pharmacoepidemiology, defence committee. *Univ. Rennes*
- 2021 **Hervy Sarah**, MSc in Pharmacoepidemiology, defence committee. *Univ. Rennes*
- 2021 **Paumier Adeline**, MSc in Pharmacoepidemiology, defence committee. *Univ. Nantes*

Service to the Scientific community

SERVICE AND OUTREACH

- Contributor of the R package RISCA**, Statistical package for cohort-based analyses, for both prediction and causal inference. *2019-present*
- Colloque francophone interfacultaire de recherche en biostatistique**, Program chair *2024*
- UMR INSERM U1246 SPHERE council**, Committee Member, PhD students' representative *2020-2021*
- Scientific Mediation**, Second prize to the local edition of the *Three minutes thesis* French version. *2020*

PEER REVIEW

French Biomedicine Agency (methodological reviewer)
Statistical Methods for Medical Research, BMC Medical Research Methodology, Statistics in Medicine, Therapeutic Advances in Respiratory Disease, Frontiers in Public Health, Social and Personality Psychology Compass

PROFESSIONAL MEMBERSHIPS

International Society for Clinical Biostatistics, International Biometric Society, French Statistical Society, Society for Epidemiologic Research, Society for Causal Inference, and Statistical Society of Canada.

Referees

Yohann Foucher, Professor of Biostatistics at Université de Poitiers, France. Ph.D. supervisor.
Yohann.Foucher@univ-poitiers.fr

Robert Platt, Professor of Biostatistics at McGill University, Canada.
robert.platt@mcgill.ca

Mireille Schnitzer, Associate Professor of Biostatistics at Université de Montréal, Canada.
mireille.schnitzer@umontreal.ca