Rebeca Cardim Falcao

CONTACT INFORMATION

Department of Mathematics
University of British Columbia
121, 1984 Mathematics Road
Vancouver, BC V6T1Z2 Canada

*email:*rcardim@math.ubc.ca
+16044458007
Brazilian

RESEARCH INTERESTS

Statistical and mathematical analysis of single molecule trajectories, Markov Chain Monte Carlo, nonparametric Bayesian methods, machine learning, statistical mechanics and fragmentation.

EXPERIENCE

University of British Columbia, Vancouver, Canada
Ph.D. in Applied Mathematics, 2014 - 2021 (expected),
Thesis (in progress): Multi-states inference for analysing noisy single-particle trajectories. Advisor: Daniel Coombs
Co-organizer of Frontiers in Biophysics conference, held at UBC, June 2017.
Notable Experience: Designing and developing a procedure for online exams to replace written exams in MATH 103 course (*2018-2020*).

MNP-UBC-unity, Vancouver, Canada
Researcher (*Sep, 2020 - Dec, 2020*): Developing an app to perform risk analysis of Covid-19 exposure for businesses.

BCCDC, Vancouver, Canada
Math Modeller (*Mar, 2020 - Aug, 2020*): Modelling Covid-19 epidemic, and impact of NPI's to control the spread with focus on contact tracing, and possible vaccinations scenarios.

Visier, Vancouver, Canada
MITACS-Intern (*Jul, 2019 - Nov, 2019*): Design an algorithm to make Visier's data consistent.

Universidade Federal de Pernambuco, Recife, Brazil
M.Sc. in Physics, 2012 - 2014

PREPRINTS AND PUBLICATIONS

1) Developing an app to perform a personalized risk assessment of Covid-19 for businesses. *In preparation, CovidPilot app*
2) Importance of COVID-19 vaccine efficacy in older age groups *with Manish Sadarangani et al. To appear in Vaccine*
3) Quantifying the impact of COVID-19 control measures using a Bayesian model of physical distancing, *with Sean C Anderson et al. PLOS Computational Biology, 2020*
4) Diffusion analysis of single particle trajectories in a Bayesian nonparametrics framework *with Daniel Coombs Physical Biology, v.17, 2020*
5) Limitations of Qdot labelling compared to directly-conjugated probes for single particle tracking of B cell receptor mobility *with Abraham et al. Scientific Reports, v.7, 2017*
6) Fragmentation of brittle plates by localized impact *with Fernando Parisio Applied Physics Letters, v.105, number 12, 2014*

HONOURS, AWARDS AND FELLOWSHIPS

- UBC Mathematics Graduate Research Award 2019: given to best student researchers in the Department of Mathematics every year.
- Travel Award for the Summer School *Mathematics of Machine Learning* held in UW-Seattle.
- Travel Award for the Workshop *Reverse mathematical methods for reconstructing molecular dynamics in single cell* held in the CRM-Pisa.

COMPUTER SKILLS

- **Python**, **R**, **MATLAB**, **Mathematica**.
- Some familiarity with **PERL**, and **C**.

TALKS AND POSTERS

- *Mathematics Graduate Research Award Colloquium*
  Vancouver, UBC, 2020
  Title: Graduate Research Award: Multi-state diffusion analysis of single-particle trajectories.
- *Reverse mathematical methods for reconstructing molecular dynamics in single cell.*
  Pisa, Italy, October 2018.
  Title: Multi-state Diffusion Analysis with Measurement Errors.
- *ImmunoBC*
  Vancouver-BC, Canada, June 2018.
  Title: Finding clues to T cell activation in dynamic analysis of peptide-MHC mobility.
- *4th Annual Biophysical Society of Canada meeting*
  Vancouver-BC, Canada, May 2018.
  Title: Two-state Diffusion Analysis with Measurement Errors.
- *Graduate Summit in Mathematical Biology and Applied PDE*
  Jasper-Alberta, Canada, May 2017.
  Title: Mobility of peptide-MHCs in the Immune Synapse.
- *Frontiers in Biophysics*
  Vancouver, Canada, June 2016.
  Title: A Critical Comparison of Single Particle Tracking with Cy3 and Quantum dot labels.
- *XVI Brazilian School of Probability*
  Recife, Brazil, August 2012.
  Poster Title: Statistical model of impact fragmentation.

Workshops, summer schools and Conferences

- Mathematics of Machine Learning
  Mathematical Sciences Research Institute (MSRI),University of Washington, July 2019.
- Immuno-BC
  SFU, Vancouver, Canada, June 2017.
- Mathematical Topics in System Biology
  Mathematical Sciences Research Institute (MSRI), Berkeley-CS, USA, July 2015.
- Advanced School on Quantum Foundation and Open Quantum System
  Joao Pessoa, Brazil, July 2012.