

Jeremy Rothschild

DATA SCIENTIST · MACHINE LEARNING · PH.D. PHYSICS

☎ (+1) 514-702-0071 | ✉ jerben.rothschild@gmail.com | 📷 [jbRothschild](#) | 📺 [jerrothschild](#) | Toronto, Canada

Summary

I am a quantitative scientist with 7+ years of research experience, analyzing complex systems at the interface of physics and biology through analytical models and simulations. Over the past 5 years, I have been fostering a learning community whose mission is self-learning of principles in data science, participating in many hands-on projects in collaboration with peers. I am looking to apply data science techniques to develop creative insight on complex problems in financial markets.

Work experience

Graduate Researcher

07/2017 - present

Physics Research Group at University of Toronto

- Conceptualized and executed research projects on the dynamics of stochastic communities of interacting species, utilizing analytics, simulations, and agent-based models to study population coexistence in complex ecosystems.
- Developed and analyzed 🧠 models of community populations with novel structure using Python and C/C++. Contributed to the scientific community by sharing code and data through online repositories like GitHub.
- Collaborated with two large experimental labs at the University of Toronto as a theoretician. Designed and implemented models of 🧠 diffusion in tumors for cancer treatments and 🧠 bacterial spatial confinement
- Published research in five peer-reviewed journals and presented findings at major scientific conferences such as the American Physical Society and the Biophysical Society of Canada. Demonstrated a commitment to disseminating research results to the broader scientific community.

Founder

08/2018 - present

Humans Learning Machine Learning

- Founded and grew 🧠 HLML, a graduate student organization dedicated to self-teaching and skill-sharing of data science topics, securing \$5,000 funding for members' professional development.
- Organized weekly tutorials and coding sessions for 10-20 participants. Designed and delivered 15+ tutorials on advanced topics such as Transformers, Diffusion models, Laplacian Eigenmaps, and SQL.
- Completed multiple extra-curricular data science projects, including a SQL database for stock market prediction, a card game image generator, a scientific abstract generator, and an AI Gym wrapper for easier development of reinforcement learning algorithms.

Chair

08/2019 - 05/2020

University of Toronto Graduate Student Union (UTGSU)

- Coordinated meetings for 50+ directors, synthesizing input to create concise motions that remained inclusive and on-topic.
- Mediated challenging discussions among diverse groups, fostering mutual respect and enabling progress towards organizational goals.

Teaching Assistant

08/2017 - 12/2022

Department of Physics at University of Toronto

- Developed and delivered innovative teaching materials, including tutorials and notes, for over 10 undergraduate and graduate courses.
- Conducted assessments of trainees, offering personalized feedback and guidance to ensure successful completion of coursework.

Projects (selected)

Developer

03/2023

Hack-the-Mist, Hackathon

- Won first prize in the Hack-the-Mist hackathon at the University of Toronto for our project: 🧠 Washing away Greenwashing.
- Used webscraping and novel NLP models (Transformers and Word2vec) to illustrate the disconnect between a company's marketing about their climate action and the concrete steps taken towards sticking to these environmental pledges.
- Created an interactive display using Spark to help share our results in an engaging visualition.

Developer

02/2021 - 12/2021

bumbleBERT: an article abstract generator

- Built and trained a cutting-edge NLP transformer in PyTorch for abstract generation from prompts, compiling large scientific article archives into a user-friendly Python database.
- Created a 🧠 cloud-compatible Jupyter notebook for easy access to the NLP transformer and database.

Education

Ph.D. in Physics, University of Toronto

09/2017 - 03/2023

M.Sc. in Physics, McGill University

09/2014 - 06/2017

B.Sc. in Mathematics & Physics, McGill University

09/2011 - 06/2014

Skills

Programming	Python, C/C++, Git, SQL, Bash, Matlab, LaTeX
OS	Linux, Windows, MacOS
ML/DL frameworks	Pytorch, Tensorflow, Scikit-learn, Pandas
Mathematics	Statistics, Linear algebra, Multivariable calculus
Languages	French (fluent), English (fluent)

Publications (selected)

10/2022	Phenomenology and dynamics of competitive ecosystems beyond the niche-neutral regimes , N Leibovich, J Rothschild, S Goyal, A Zilman	<i>PNAS</i>
04/2021	Pleiotropy enables specific and accurate signaling in the presence of ligand cross talk , D Kirby, J Rothschild, M Smart, A Zilman	<i>Physical review E</i>
05/2020	The entry of nanoparticles into solid tumours , S Sindhwani, AM Syed, J Ngai, BR Kingston, L Maiorino, J Rothschild, et al.	<i>Nature materials</i>