

curriculum vitae of  
**Alin Morariu**

COMPUTATIONAL EPIDEMIOLOGY · BAYESIAN INFERENCE & STATE TRANSITION MODELS · GPU COMPUTING  
BIO-STATS · PROBABALISTIC LEARNING

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☎ +1 647 856 6852    in linked-in-alinmorariu    📄 Research Gate

## EDUCATION

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Oct. 2021 – Sept. 2025	<b>Ph.D.</b> Statistics <b>Thesis:</b> Computationally intensive inference methods for stochastic epidemic models <b>Supervisor:</b> Dr Christopher Jewell, Professor Paul Fearnhead	LANCASTER UNIVERSITY
Sept. 2019 – July 2021	<b>M.Sc</b> Applied Mathematics <b>Thesis:</b> Financial Bandits - Development of Thompson Sampling for Financial Data <b>Supervisor:</b> Professor You Liang	RYERSON UNIVERSITY
Sept. 2014 – June 2019	<b>Honours B.Sc.</b> Statistics Specialists, Mathematics Minor <b>Capstone Project:</b> Bayesian model comparisons via numerical summaries of Probability Integral Transforms <b>Supervisor:</b> Professor Daniel Simpson	UNIVERSITY OF TORONTO

## PUBLICATIONS

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Publications marked with †are in pre-print.

### CONFERENCE AND JOURNAL PUBLICATIONS

1. Kamal Rai, Patrick Brown, Alin Morariu, Hwashin Hyun Shin. (2021)  
*Detection of Temporal Trends in Association between Air Pollution and Public Health* †  
Submitted to the Biometrics Journal of the International Biometrics Society
2. Ethan Johnson-Skinner, You Liang, Na Yu, Alin Morariu (2021)  
*A Novel Algorithmic Trading Strategy using Hidden Markov Model for Kalman Filtering Innovations*  
2021 IEEE 45th Annual Computers, Software, and Applications Conference (COMPSAC)

## HONORS

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2019-2021	Ryerson Graduate Fellowship Department of Mathematics	TORONTO METROPOLITAN UNIVERSITY
2019-2021	Graduate Development Award (GDA) Department of Mathematics	TORONTO METROPOLITAN UNIVERSITY
2019-2021	Mathematics Graduate Award Department of Mathematics	TORONTO METROPOLITAN UNIVERSITY
2014-2019	Trails Dion Bursary for Post Secondary School	TRAILS YOUTH INITIATIVES

## ACADEMIC EXPERIENCE

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### TEACHING ASSISTANT

Sept. 2019 – present	Department of Mathematics <b>Courses:</b> MTH110 (Discrete Mathematics I), MTH380 (Probability and Statistics I), MTH410 (Statistics)	RYERSON UNIVERSITY
Jan. 2018 – June 2019	Department of Statistics <b>Courses:</b> STA130 (An Introduction to Statistical Reasoning and Data Science), STA302 (Methods of Data Analysis I), STA314 (Statistical Methods for Machine Learning I)	UNIVERSITY OF TORONTO

## RESEARCH ASSISTANT

May 2019 - Aug. 2019	Summer Research Student	ST. MICHAEL'S HOSPITAL
	<ul style="list-style-type: none"> <li>• Authored R package <b>psmplr</b> to perform posterior distributions sampling of random effects in spatio-temporal air pollution models</li> <li>• Construct global envelopes for time-varying predictive intervals of pollutant random effect</li> </ul>	
Jan. 2018 - May 2019	Research Assistant - Department of Statistics	UNIVERSITY OF TORONTO
	<ul style="list-style-type: none"> <li>• Evaluate effectiveness of the university's statistics program and course offerings to update curriculum</li> </ul>	
Jan. 2018 - May 2018	Research Assistant - Risk Lab	UNIVERSITY OF TORONTO
	<ul style="list-style-type: none"> <li>• Develop quantitative methodology to construct a financial index for cryptocurrencies to monitor asset class performance</li> </ul>	

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PROFESSIONAL EXPERIENCE

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May 2020 - Dec 2021	Data Science Intern	ONTARIO TEACHER'S PENSION PLAN
	<ul style="list-style-type: none"> <li>• Implemented machine learning models to forecasting trading costs for futures contracts and options</li> <li>• Provided detailed reports of historical trade performance on futures contracts and options trades</li> </ul>	
Sept. 2017 - Dec 2017	Actuarial Analyst - Consumer Market Pricing	MANULIFE FINANCIAL
	<ul style="list-style-type: none"> <li>• Standardized pricing models across health, dental, and travel products to eliminate need of per-product updates when repricing</li> <li>• Revitalized travel pricing methodology using fundamental machine learning techniques to predict claims and highlight risk factors</li> </ul>	
May 2017 - Aug. 2017	Investment Consulting Analyst	MERCER (CANADA) LIMITED
	<ul style="list-style-type: none"> <li>• Monitored quarterly performance of funds with a keen focus on past results in order to optimize asset allocation of institutional clients</li> <li>• Automated daily data entry process with VBA Macros to half run time of asset reconciliation</li> </ul>	
Jan. 2016 - May 2016	Pension Consulting Analyst	MERCER (CANADA) LIMITED
	<ul style="list-style-type: none"> <li>• Performed funding valuation to determine updated liabilities resulting in savings of \$100,000 annually</li> <li>• Linearized single benefit and PSPA calculations with the creation of an Excel-based calculator to reduce manual calculations by 90%</li> </ul>	

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SKILLS

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**Programming:**

- **R** (packages include tidyverse, tidybayes, INLA, timeseries, TSA, Matrix)
- **Python** (packages include numpy, pandas, scikit-learn, statsmodels, scipy, plotly)
- **Stan** (probabilistic programming language for Bayesian inference with MCMC sampling)

**Languages:**

- English (native proficiency), Romanian (native proficiency)

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EXTRACURRICULAR ACTIVITIES

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2019 - Present	R Workshop for STEM Students	RYERSON UNIVERSITY
2017 - Present	Mentor and Guest Speaker	TRAILS YOUTH INITIATIVES

2017-2019	President & External Relations Executive, Romanian Student Club	UNIVERSITY OF TORONTO
2013-2016	Volleyball Coach	VICTORIA PARK C.I.

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**SELECTED COURSES AND SEMINARS**

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**Graduate**

Advanced Numerical Analysis

Applied Statistical Methods

Topics in Machine Learning (Fields Institute)

Analysis and Probability

Principles and Techniques in Applied  
Mathematics**Undergraduate**

Real analysis

Methods for Data Analysis

Surveys, Sampling and Observational Data

Statistical Computation

Statistical Methods for Machine Learning

Methods of Applied Statistics

Mathematical Statistics

Advance Linear Algebra

Probability

Theory of Statistical Practice

Time Series Analysis

Methods for Multivariate Data

Stochastic Processes

Theory and Methods for Complex Spatial  
Data