Justin Furlotte

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Education

MSc. Mathematics - University of British Columbia April 2022
Courses: Applied Machine Learning, Machine Learning, Advanced Machine Learning, Probability, Stochastic Processes
Awards: NSERC Canada Graduate Scholarship - Master's (CGS-M), Faculty of Graduate Studies Award

BSc. Mathematics & Physics - University of New Brunswick December 2019
Courses: Probability & Statistics, Numerical Methods, Computational Physics, Measure Theory
Awards: NSERC Experience Award, Arthur & Sandra Irving Primrose Scholarship, others

Work Experience

Assistant Physicist 2017-2021
C-Therm Technologies

- Gained strong proficiency in scientific software development in Python by designing and implementing regression algorithms to extract thermal material properties from experimental curves.
- Significant bottom-line impact as the sole developer of the "Flex TPS" regression algorithm, which is now one of their core test methods and retails for $9,100.
- Performed mathematical R&D on other unreleased projects, which resulted in a publication.

Head Teaching Assistant 2020-present
Mathematics Department - University of British Columbia

- Leader for all TAs of UBC's Differential Calculus course. High reviews from student evaluation surveys for ability to explain complex mathematical concepts in simple language.
- Previously a Graduate TA for an Applied Linear Algebra course.

Projects

- **Outlier Detection in NHL Goal Scoring:** Ensemble model to predict goals scored by NHL players (cross-validation MAE of 1.6 goals). Involved significant preprocessing of data from moneypuck.com. Deployed on https://outlierdetectionnhl.herokuapp.com as a Plotly Dash application.
- **Vector-Quantized Naive Bayes:** Full from-scratch implementation in Julia.
- **Income Prediction:** Predicting whether income exceeds $50k using machine learning and Kaggle's Adult Census Income Dataset.
- **Telecom Customer Churn:** Predicting churn using Kaggle's dataset for Telecom customers.
- **Master's Thesis**: Quantum Hall effect; proving bulk-edge correspondence in interacting lattice systems. Uses mathematical tools such as functional analysis, spectral theory, and operator algebras.
- **Publication with C-Therm:** Temperature Fields Generated by a Circular Heat Source (CHS) in an Infinite Isotropic Medium: Treatment of Contact Resistances with Application to Thin Films, International Journal of Heat and Mass Transfer 137:677-689 (April 2019).
- **Others/Where to View:** Full project portfolio on personal website, https://justin-furlotte.github.io.

Skills

Programming Languages: Python, Julia, C#, Matlab
Libraries/Tools: Scikit-Learn, NumPy, SciPy, Pandas, Jupyter, Plotly, Dash, Git, LaTeX