Isaac Lavine

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lavinei.github.io

EDUCATION

PhD Student in Statistical Science — August 2016 - Present
Duke University — Durham, NC

B.A. in Mathematics, B.S. in Chemical Engineering — May 2014
Lafayette College — Easton, PA

ACADEMIC HONORS

BEST Award (2017): BEST Foundation award to support Bayesian research in financial time series
National Science Foundation: Honorable Mention for the Graduate Research Fellowship
Luther F. Witmer Prize (2014): Lafayette College Chemical Engineering senior award

SKILLS AND ACTIVITIES

Programming Languages: R, Python, MATLAB. Basic SQL, C++, and Scala. Bash shell scripting.
Software Experience: Spark and Hadoop. Tableau Desktop and Server, Qlikview and Qliksense.
Teaching Assistant: Introduction to Bayesian Statistics (STA 601), Linear Models (STA 721), Probability and Statistical Models (STA 831)
Professional Memberships: American Statistical Association (ASA). Sections: Bayesian Statistical Science (SBSS), Statistical Consulting, and Business and Economic Statistics

RELEVANT COURSEWORK

Deep Learning – Deep Learning Independent Study (2 semesters), Deep Learning for Coders (online course), Neural Networks and Deep Learning (textbook)
Statistical Forecasting – Time Series and Dynamic Models, Bayesian Forecasting
Programming – Statistical Computing (Python), numerical optimization

RESEARCH EXPERIENCE

Bayesian Forecasting and Decision Analysis: January 2019 – Present — Durham, NC
84.51 Research Assistant: Bayesian modeling, forecasting, and decision analysis for many count-valued time series in collaboration with 84.51. Researching computationally efficient methods of sharing information across series. Developing a Python package for open-source release.

Robust Latent Factor Analysis: August 2018 – June 2019 — Durham, NC
NIH Research Assistant: Developing robust dimension reduction strategies to identify consistent risk factors in studies of chemical exposures. Primarily focused on latent factor models, while aiming to develop broadly applicable techniques for robust estimation.

Dynamic Forecasting: August 2016 – May 2018 — Durham, NC
SAMSI Optimization Research Assistant: Developed an adaptive variable selection strategy for sequential prediction in Bayesian dynamic models. Brought in novel ideas from Bayesian decision theory to combine goal-focused metrics, such as multiple step-ahead forecasting, with scalable computational strategies. Applied the strategy to long-term economic forecasting.

Deep Learning: August 2017 – May 2018 Durham, NC
Independent Study: Worked with Prof. Joe Lucas to predict medical diagnoses at Duke Hospital. Developed a deep learning model to predict mortality risk for patients with pulmonary hypertension. Derived model features from diagnosis codes, patient medications, and previous hospital visits.

Lafayette College: June 2012 – May 2014 Easton, PA
EXCEL Research Scholar and Honors Thesis student: Developed a predictive numerical simulation of passivation processes in optoelectronic semiconductor materials. Used MATLAB to design and implement a custom finite difference scheme for numerically solving systems of partial differential equations to improve simulation accuracy and robustness.

PROFESSIONAL EXPERIENCE

LinkedIn: May 2018 – August 2018 Sunnyvale, CA
Machine Learning and Relevance Intern: Worked on the ranking algorithm for content in the LinkedIn Feed. Helped to develop predictive models for clicks, responses, and impressions. Created a multi-objective optimization strategy for distributing user attention across the LinkedIn network. Learned Scala and Spark to fit predictive models, and implemented optimization routine in R.

Duke Information Initiative: May 2017 – August 2017 Durham, NC
Data + Project Manager: Managed a team of master's and undergraduate students exploring disease classification systems, medical billing, and local public health data. Led by Prof. Rachel Richesson, the team worked towards quantifying and visualizing the prevalence of rare diseases at Duke Hospital.

Thorogood Associates: July 2014 – September 2015 Philadelphia, PA
Business Intelligence and Analytics Consultant: Used technologies such as R, Tableau, and SQL Server to provide business insights for a global packaged goods company. Led efforts in R to implement dynamic linear models for time series of sales and the installation of Rserve on Linux servers. Developed Tableau reports on SQL databases and presented in marketing events for a variety of clients.

COLLECTED WORKS

Refereed Articles:
Evaluating remote sensing of deciduous forest phenology at multiple spatial scales using PhenoCam imagery
Biogeosciences, 11, 4305-4320 (2014)
S.T. Klosterman, K. Hufkens, J.M. Grey, E. Melaas, O. Sonnentag, **I. Lavine**, L. Mitchell, R. Norman, M.A. Friedl, and A.D. Richardson.

Submitted Manuscripts:
Adaptive Variable Selection for Sequential Prediction in Dynamic Models
I. Lavine, M. Lindon, M. West

Magazine Articles:
Sea Turtles: A Case of Animal Magnetism
CHANCE Magazine
Michael Lavine, J. Roger Brothers, Kenneth J. Lohmann, **Isaac Lavine**

Undergraduate Honors Thesis:
Modeling and Simulation of Hydrogen Passivation in Semiconductor Photonic Materials
Lafayette College Department of Chemical Engineering (2014)
Advisor: Prof. Joshua A. Levinson, Ph.D.

CONFERENCE PRESENTATIONS

Joint Statistical Meetings (JSM): July 2019 Denver, CO
Adaptive Variable Selection for Sequential Prediction in Dynamic Models

SAMSI Graduate Fellows Poster Session: May 2017 Durham, NC
Adaptive Variable Selection for Sequential Prediction in Dynamic Models

American Chemical Society (ACS): March 2014 Dallas, TX
Modeling and simulation of hydrogen diffusion and reaction in semiconductor photonic materials