Michael Valancius

PhD Candidate in Biostatistics

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Summary

An enthusiastic, inquisitive, and adaptive person with an extensive background in statistics, data science, and machine learning, I enjoy collaborating on data projects across a broad spectrum of application areas. I am especially interested in translating theory into practical methodology, working on interdisciplinary teams, and the mentorship of aspiring data practitioners.

Skills

- Statistical Analysis
- Machine Learning
- Causal Inference
- Deep Learning
- Precision Medicine

- Reinforcement Learning
- Clinical Trials, Experiments
- Bayesian Statistics
- R, Python, SQL, SAS

- Tensorflow, PyTorch, NumPy
- Data Visualization
- Presentations
- Group Leadership

Education

University of North Carolina, Chapel Hill (2020-2024)
PhD in Biostatistics
Advisors: Michael Kosorok (Biostatistics), Junier Oliva (Computer Science)

Duke University (2018-2020)
M.S. in Statistical Science

University of Miami (2014-2017)
B.S. in Mathematical Economics, Minors in Mathematics and Industrial Engineering, Summa Cum Laude

Doctoral Projects

Machine Learning for RWE in Clinical Trials
- Developed causal framework for incorporating external controls into a hybrid clinical trial
- Derived conditions under which estimation of nuisance functions with machine learning models leads to standard root-n statistical inference

Active Feature Acquisition for Prediction/Decisions
- Proposed a RL algorithm for sequentially acquiring costly features for causally-valid decisions
- Investigating Imitation learning for predictions
- Applications to predicting drug-feasibility

Limiting Adverse Birth Outcomes
- Modeling patterns of labor progression in a large observational study in Africa and India and constructing Individualized Treatment Rules (ITRs)

Professional Experience

Data Analyst, Prometheus Group (2017-2018)
- Generated SQL queries to report on customer KPIs through an internally-built dashboard
- Led the integration of three new clients and oversaw a > 100% increase in requested KPIs.
- Initiated the implementation of machine learning methods to predict maintenance requests

Data Scientist Intern, Civis Analytics (Summer 2019)
- Developed an internal data-validation R package hosted on a Docker Image and available to users locally or through the Civis Analytics platform
- Analyzed trends in migration patters of internally displaced persons and its impact on the spread of malaria
- Presented on Bayesian hierarchical models

Selected Publications

- Freeman N, **Valancius M**, et al. (2021) Beyond Two Cultures: Cultural Infrastructure for Data-driven Decision Support. *Observational Studies*.
- Kim S, **Valancius M**, et al. (2021) Discussion of 'Estimating time-varying causal excursion effects in mobile health with binary outcomes'. *Biometrika*
- **Valancius M,** et al (*submitted*) Acquisition Conditional Oracle for Nongreedy Active Feature Acquisition
- **Valancius M** & Kosorok M. (*In prep*) The Usage of Machine Learning for Efficient Estimation of Treatment Effects in Hybrid Trials