Jimmy Hickey

jimmyjhickey@gmail.com | jimmyjhickey.com | /in/jimmyjhickey | (919) 480 2225

Education

Ph.D. Statistics	2024
M.S. Statistics	2020

North Carolina State University
Bayesian Transfer Learning Methods with Uncertainty Quantification for Biomedical Applications

B.S. Computer Science; B.S. Physics; B.A. Mathematics	2018

Winona State University
Minors: Statistics, Data Science

Skills

Languages: Python, R, Julia, C/C++, Bash, Java, SQL

Tools & Frameworks: PyTorch, TensorFlow, CUDA, Linux, HPC Environments, Git

Methods: Transfer Learning, Generative AI, Machine Learning, Uncertainty Quantification, NLP/LLMs

Soft Skills: Statistical Consulting, Teaching, Data Visualization, Interdomain Communication

Professional Experience

Machine Learning Researcher — 2019 - present
Duke Clinical Research Institute

- The applied focus of this work has been to improve stroke risk prediction. Using a combination of multiple studies, we were able to successfully improve stroke diagnosis, especially in underrepresented minorities. The goal of this work is to improve patient care and equity.
- Lead development and publication of a flexible machine learning method improving predictive performance and interpretability of time-to-event outcomes (see publications 2 and 5).
- Develop novel transfer learning methods addressing demographic bias in predictive modeling (see publication 1).

Statistics Researcher — 2019 - present
North Carolina State University

- The applied focus of my work has been to improve patient care by looking at medical data. We have been successfully able to improve predictions of whether patients will go into shock upon being admitted into the ICU and to predict common dental measurements that can be early signs of tooth decay.
- Create a source free Bayesian transfer learning method improving predictive performance with uncertainty quantification (see publications 3 and 4).
- Implement state-of-the-art transfer learning methods in Python, R, and Julia.
- Implement Generative AI models to compare method performance (see publication 6).
- Present work at conferences and events to diverse audiences.

Statistical Scientist — 2020 - 2024
Sandia National Laboratories

- Solved problems involving combing multiple remote sensing data sets, physics based statistical modeling, and computer vision.
- Optimized statistical computing methods, reducing computational complexity by a factor of $O(n^2)$.
- Supported national defense using RNNs and deep learning for signal processing.
- Modeled trajectories for engineering applications using functional data analysis.

Co-Founder   2020 - 2023
NCSU Statistics in the Community
- Secured clients for a pro bono consulting group.
- Visualized data and predictive results in reports and presentations given to non-statistical clients.
- Manage and mentor new consultants.
- Mapped unmet need to allocate donated furniture and analyzed school system data for unmet adolescent need. [report]
- Developed interpretable metrics for donation lag times. [report]
- Analyze newsletter data to improve click-through and subscriber retention. [report]

Tutor   2016 - 2022
Winona State University & North Carolina State University
- Tutored students in computer science, statistics, physics, and mathematics.
- Assisted the highest number of students per year at Winona State University.
- Provided one-on-one and small group tutoring, and classroom teaching.

Genomic Systems Programmer Analyst   2018 - 2019
Mayo Clinic
- Developed variant annotation and microbiome pipelines for researchers and clinicians.
- Optimized bioinformatics algorithms to parallelize for high-performance computing (HPC).
- Create onboarding procedures for new hires.

Software Engineer   2016 - 2018
Digi International
- Build firmware for microcontrollers, routing devices, and embedded systems.
- Write automated unit, integration, and system tests for multiple teams.
- Participate in an agile development environment.

Technical Support   2015 - 2016
Winona State University
- Help faculty, staff, and students with technical problems over the phone and onsite.
- Troubleshoot both hardware and software issues.

Publications
1. **J Hickey**, J P Williams, E C Hector (2024). Transfer Learning with Uncertainty Quantification: Random Effect Calibration of Source to Target (RECaST). *The Journal of Machine Learning Research* [manuscript]
2. **J Hickey**, R Henao, M Pencina, D M Wojdyla, M Engelhard (2024). Adaptive Discretization for Event PredicTion (ADEPT). *AISTATS* [manuscript]
3. C Hong, M Liu, D M Wojdyla, **J Hickey**, M Pencina, R Henao (2024). Trans-Balance: Reducing Demographic Disparity for Prediction Models in the Presence of Class Imbalance. *The Journal of Biomedical Informatics* [manuscript]
4. **J Hickey**, E C Hector, J P Williams (202x). Multivariate and Online Transfer Learning with Uncertainty Quantification. *In Review* [arXiv]

Professional Presentations
1. Adaptive Discretization for Event PredicTion (ADEPT). *AISTATS Poster Presentation*. May 2024
2. Transfer Learning with Uncertainty Quantification: Random Effect Calibration of Source to Target (RECaST). *Joint Statistical Meeting Oral Presentation*. August 2023
3. Transfer Learning with Uncertainty Quantification: Random Effect Calibration of Source to Target (RECaST). *North Carolina State University Graduate Research Symposium Poster Presentation*. April 2023

4. Trans-Balance: Reducing Demographic Disparity for Prediction Models in the Presence of Class Imbalance. *Duke University Oral Presentation*. April 2023
5. Transfer Learning with Uncertainty Quantification: Random Effect Calibration of Source to Target (RECaST). *ENAR Poster Presentation*. March 2023
6. Improving Event Time Prediction by Learning to Partition the Timeline. *Duke University Oral Presentation*. March 2023
7. Improving Event Time Prediction by Learning to Partition the Timeline. *North Carolina State University Oral Seminar*. September 2022
8. Transfer Learning with Uncertainty Quantification: Random Effect Calibration of Source to Target (RECaST). *Joint Statistical Meeting Poster Presentation*. August 2022

Service

- Session Chair *ENAR* 2023

- Student Representative *NCSU Statistics Seminar Committee* 2022-2023

- Graduate Mentor *NCSU Summer Institute in Biostatistics* 2022

- President *NCSU Statistics Graduate Student Association* 2020-2022

- Organizer *NCSU Virtual Datathon* (article) 2021

- Organizer *NCSU College of Science Research Symposium* 2021

- Organizer *NCSU Statistics Prospective Student Visit Day* 2020

- Organizer *NCSU Deep Learning Reading Group* 2019-2020

- Vice President *WSU Women in Computer Science Club* 2017-2018

- Student Representative *WSU Dean's Advisory Council* 2017-2018

- President *WSU Physics Club* 2015-2018

Honors and Awards

- Paige Plagge Graduate Award for Citizenship *NCSU Statistics Department* 2021

- Outstanding Graduate in Computer Science *WSU* 2018

- Outstanding Graduate in Physics *WSU* 2018

- Outstanding Graduate in Mathematics *WSU* 2018

- Outstanding Student Leader Nominee *WSU* 2018

- 1st Place *Midwest Undergraduate Data Analytics Competition* 2018

- Best College Overall *ASA Police Data Challenge* (link to competition) 2018

- Top 5 Undergraduate *MinneAnalytics Data Analytics Competition* 2017