NBER AI Workshop Application

Contact Information:

Name: Jesse Neumann

Phone Number: 916-730-4336

Email address: jn495@economics.rutgers.edu

Interest Statement

My interest in artificial intelligence focuses on machine learning, a subset of AI involving the training of algorithms to find patterns in data that would otherwise be imperceptible to researchers. My experience with machine learning is focused on its application in asset pricing. I am interested in the benefits and drawbacks of the increased use of deep learning methods such as neural networks, variational autoencoders, and reinforcement learning, as well as other algorithms which, while not classified as "deep learning", still distort our ability to assign an economic, as well as statistical magnitude to a particular variable. There is no doubt these methods can help increase predictive accuracy, but this often comes at the cost of potentially valuable information from a policy and investment perspective. Recent work in econometric theory has focused successfully on developing methods for achieving estimates of causal inference when using a penalized regression estimator – the lasso being a popular estimator which is frequently the focus of this research. However, methods of interpreting highly nonlinear and deep learning models, such as partial dependence plots, individual conditional expectations, Shapley additive explanations and feature importance require significant assumptions to be theoretically valid and are often applied in situations where the results are not well founded or helpful. Statisticians such as Qingyuan Zhao and Trevor Hastie argue these methods are insufficient for estimating true marginal effects in the same way the literature has developed causal inference theory for penalized regression. I am interested in the development of techniques for the estimation of individual marginal effects in order to overcome the drawbacks of implementing deep learning models in the context asset pricing, and financial economic more broadly.

Curriculum Vitae

Education

Rutgers University — **New Brunswick, NJ**
Ph.D. in Economics (Expected) — *August 2017 - Present*
Fields: Financial Economics, Econometrics

Johns Hopkins University — **Washington, D.C.**
M.S. in Economics — *August 2012 - May 2014*

University of the Pacific — **Stockton, CA**
B.S. in Business Administration — *August 2008 - May 2012*

Key Coursework

Machine learning (Computer science department)
Financial economics
Econometrics (I, II, Bayesian, Micro, Macro)

In-Progress Papers

"A Machine Learning Approach to Predicting Credit Default Swaps Using Fundamental Risk Indicators"
"Good Data or Big Data? Evidence from Asset Pricing Models"
"Radio Ownership and Bank Panic Contagion" (With Eugene White)
"Evidence for the Benefits of Terminating the Chief Executive"

Non-Peer Reviewed Publications

"Yield Predictions for New Jersey's Fiscal Year 2021 Bond Issues" (With Bruce Mizrach). September 2020. Available at `https://www.researchgate.net/publication/344271019`.

"The Demise of the Mega Malls: A View From the Bond Market" (With Max Miller and Bruce Mizrach). August 2020. Available at `https://www.researchgate.net/publication/343555329`.

Research Experience

Research Assistant, Mark Killingsworth, Rutgers University Aug 2020 - Dec 2020
Data management and processing (>6,000 files) using Python

Research Analyst, Center for Business and Policy Research Jul 2014 - Aug 2018