# Bugbears or Legitimate Threats? (Social) Scientists' Criticisms of Machine Learning?

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## ABSTRACT

Social scientists increasingly criticize the use of machine learning techniques to understand human behavior. Criticisms include: (1) They are atheoretical and hence of limited scientific value; (2) They do not address causality and are hence of limited policy value; and (3) They are uninterpretable and hence of limited generalizability value (outside contexts very narrowly similar to the training dataset). These criticisms, I argue, miss the enormous opportunity offered by ML techniques to fundamentally improve the practice of empirical social science. Yet each criticism does contain a grain of truth and overcoming them will require innovations to existing methodologies. Some of these innovations are being developed today and some are yet to be tackled. I will in this talk sketch (1) what these innovations look like or should look like; (2) why they are needed; and (3) the technical challenges they raise. I will illustrate my points using a set of applications that range from financial markets to social policy problems to computational models of basic psychological processes. This talk describes joint work with Jon Kleinberg and individual projects with Himabindu Lakkaraju, Jure Leskovec, Jens Ludwig, Anuj Shah, Chenhao Tan, Mike Yeomans and Tom Zimmerman.

## Biography

Sendhil Mullainathan is a Professor of Economics at Harvard University and a Cornell Tech Fellow. His real passion is behavioral economics. His work runs a wide gamut: the impact of poverty on mental bandwidth; whether CEO pay is excessive; using fictitious resumes to measure discrimination; showing that higher cigarette taxes makes smokers happier; modeling how competition affects media bias; and a model of coarse thinking. His latest research focuses on using machine learning and data mining techniques to better understand human behavior.

He enjoys writing, having recently co-authored Scarcity: Why Having too Little Means so Much and writes regularly for the New York Times.

He also occasionally enjoys doing. He helped co-found a non-profit to apply behavioral science (ideas42), co-founded a center to promote the use of randomized control trials in development (the Abdul Latif Jameel Poverty Action Lab), serves on the board of the MacArthur Foundation, and has worked in government in various roles, including most recently as Assistant Director of Research at the Consumer Financial Protection Bureau.

Much to the surprise of those who know him, he is a recipient of the MacArthur "genius" Award, was designated a "Young Global Leader" by the World Economic Forum, labeled a "Top 100 Thinker" by Foreign Policy Magazine, and named to the "Smart List: 50 people who will change the world" by Wired Magazine (UK). His hobbies include basketball, board games, googling and fixing-up classic espresso machines. He also enjoys speaking about himself in the third person, which works well for bios but less well in daily life.