Postdoc Position in Expanding Machine Learning Beyond Social Prediction to Explanation and Intervention

The Knowledge Lab at the University of Chicago seeks to hire 1-2 outstanding candidates for a postdoctoral research opportunity with support from DARPA to extend the limits of machine learning from predicting social systems to explaining causal factors in those systems to intervening in them (see recent press release here). This is in association with the “Ground Truth” program at DARPA. Other teams will generate reasonable agent-based models of diverse social systems, and our task is to build automated, analytical techniques that induce the “ground truth” or structure of the model and program used to generate them. We will also predict future instances of these social systems, and propose desirable and pragmatic interventions in them. Our team, the “Social MIND (Machine Inference for Novel Discovery)”, is exploring approaches that use large-scale Bayesian inference, probabilistic programming, deep learning neural networks, and approaches that link them together. We are recruiting for 1-2 postdoc positions at the intersection of data science, machine learning, automated scientific discovery, and social science.

Postdoctoral candidates will design and conduct independent research, in close collaboration with UChicago professor and Knowledge Lab Director, James Evans, along with Josh Tenenbaum, computational cognitive scientist at MIT, and Michael Franklin, computer scientist and leader in systems design at the University of Chicago. Candidates must have substantial computational and data science background and hold a Ph.D. in Computer Science, Statistics, Applied Math, Physics, Sociology, Economics, Psychology or another Social/Behavioral Science. Candidates should have a strong publishing record. Regardless of degree, experience with social science theory and methods a strong plus. Comfort working collaboratively with a research team is essential.

Specifically, successful candidates will be responsible for generating and automatically decoding agent-models, and applying these techniques to real social systems. Experience with some of the following will be helpful: causal analysis, deep neural networks, Bayesian inference, probabilistic programming, machine learning, and machine understanding. Candidates will be involved in both innovating new methods for specific inference tasks, and assembling approaches into automated data analytic pipelines. The broader project will also involve crowdsourcing alternative approaches, so experience with crowdsourcing and intelligent model combination also a plus. Because we will be requesting social data from the agent-modeling teams, understanding social science data gathering methods and familiarity with agent-based and game theoretic models will be very helpful. A working knowledge of Python, as well as experience with relevant libraries (e.g., scikit-learn, pandas, tf, keras, pytorch, pymc, igraph, etc.) is required. Familiarity with bash, ssh, git, databases (e.g. mysql) and AWS is expected. Positions could begin anytime within the coming year, and as early as September 2018. Competitive salary & benefits.

To apply, please send CV and names for letters from at least two references to Candice Lewis, cllewis@uchicago.edu.