

Title: Causation vs. Correlation in Human and Machine Learning

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Place:KL 232

Time: September 6, 3-4.30pm

Abstract: We learn in high school that correlation does not imply causation, but still the news, and even scientific papers, are full of announcements of new findings that "link" TV watching to obesity, El Nino to drought, ice cream to suicide, facial symmetry to perceived beauty etc. Are these links causal relations? What would it take to establish a causal relation? Can we do so without an experiment? I will explore two views of causal learning in this presentation: First, how should we infer causal relations? Are there methods for which we can prove that they correctly distinguish causes from spurious correlations? Second, given that as humans we are remarkably good at identifying causes, is this a uniquely human trait or can animals do the same? How could we test this? Overall, I will try to give a sense of the many questions there are about causation, what type of methods we now have for automatic causal discovery from data, how they can be applied in biological or social scientific settings and what the many open questions are that remain.

Bio: Frederick Eberhardt is Professor of Philosophy at Caltech. His research focuses primarily on questions related to causal discovery. This work lies at the intersection of machine learning, statistics, psychology and philosophy. Before coming to Caltech, he was Assistant Professor in the Philosophy-Neuroscience-Psychology (PNP) program at Washington University in St Louis. He did his PhD in philosophy at Carnegie Mellon in 2007, followed by a postdoc in psychology at UC Berkeley. Most recently he has been working on extremely general methods for causal discovery from heterogeneous data, and on the theoretical foundations of how to automatically construct scientific macro-variables from sensor-level data.