

Probabilities are probably not enough

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Abstract

A common goal of modeling are good predictions (“I know X, what is Y?”). It is often envisioned that the model will be used to make better decisions. In many settings, however, the decisions makers are managers, meaning they can intervene in a (natural) system. This changes the question to “If I change X, what will Y be?” – a subtle but important difference. Causal inference investigates when a model fits for both purposes. This is often discussed for statistical models only, but it can also help us to classify the capabilities and use cases of mechanistic and hybrid models.

References/Recommended reading

Arif, S., and MacNeil, M. A.: Predictive models aren't for causal inference, *Ecology Letters*, 25, 1741-1745, <https://doi.org/10.1111/ele.14033>, 2022.