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## Some alternative methods for causal discovery

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Causal inference is indeed a challenging endeavor, particularly when applied to observational studies of interacting systems. Pearl's theory, along with the PC algorithm on directed acyclic graphs, and its extensions PCMC and FCI, are powerful tools. However, their application to time series is time-consuming, and they still struggle to distinguish Markov-equivalent scenarios.

In our talk, we will present some methods based on principles that are partly or fully different from those underlying the aforementioned tools. Due to time constraints, we will focus on the main principles that allow the discovery of causal relations between a pair of systems, including hidden common causes (referred to as common drivers or confounders in different schools of thought). We won't delve into the numerous technical challenges due to the time limit.