

Frequency dependent causal inference

Background: Causal inference is one of the basic scientific topics with a long history. It's also widely applied in brain science. Due to the tiny and complex structure of cortical network, it's expensive to directly imaging wiring structure of cortical networks. However, measure the activity of neurons, especially with the help of new techs such as multi-electrode array and Neuropixel, is much cheaper and practical. Thus, causal inference answers the question that how can we extract the information of structure connectivity from those measurements of activities. In this project, we mainly use the time-delayed mutual information (TDMI) as the tool (Li et al, 2017) (Li et al, 2018). We want to ask: how does the preprocessing process, such as band filtering, affect the result of inference?

Project setups: We provide the basic framework of causal inference methods to test. [Jupyter Notebook demo]

Project map: The project core is covered by ; subsequent questions can be taken in any order.

