Time series prediction using anticipation synchronization

While many exciting techniques for time series prediction are being explored, one fascinating method from chaos theory—anticipation (or anticipatory) synchronization—has remained relatively untouched. This project aims to provide an opportunity to explore this approach, starting with the core concepts and techniques, before applying them to well-known systems. We'll then finally have a go at predicting something cool such as a stock market or brainwaves in the final weeks.

PREREQUISITES

Basic coding skills in python/matlab

Some knowledge of nonlinear dynamics is welcome but is not a necessity

TIMELINE

WEEK 1

Basic reading on dynamics and synchronization

Brushing up computational skills if needed

WEEK 2

Playing with master-slave systems

Learning about Lag synchronization and Anticipation synchronization

WEEK 3

Code: predicting the evolution of a timeseries in *known* contexts using the techniques learned

WEEK 4 /5 (Exploration)

Predicting the evolution of a timeseries in *new* contexts: One such system that I have in my mind is the *Stock market*. However the mentee may explore any other system of their choice as well.