

# Augmented Functional Time Series Representation and Forecasting with Gaussian Processes (# W21)

Nicolas Chapados and Yoshua Bengio

University of Montreal

Canada

- We introduce a functional representation of time series that forecasts over an **unspecified time horizon** (given as input variable) using progressively-revealed information sets.
- Use Gaussian Processes to get a **complete covariance matrix** between forecasts.
- Forecast covariance leads to a **risk-aware trading criterion**.
- Application to actively trade price spreads between commodity future contracts.
- We demonstrate **significant out-of-sample risk-adjusted returns** after transaction costs on a spread portfolio.

