

IPS109: Time series forecasting: Computational challenges and application to electricity load forecasting

Title of talk: [Probabilistic Forecasting for Daily Electricity Loads and Quantiles for Curve-to-Curve Regression](#)

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Abstract :Probabilistic forecasting of electricity load curves is of fundamental importance for effective scheduling and decision making in the increasingly volatile and competitive energy markets. We propose a novel approach to construct probabilistic predictors for curves (PPC), which leads to a natural and new definition of quantiles in the context of curve-to-curve linear regression. There are three types of PPC: a predict set, a predictive band and a predictive quantile, and all of them are defined at a pre-specified nominal probability level. In the simulation study, the PPC achieve promising coverage probabilities under a variety of data generating mechanisms. When applying to one day ahead forecasting for the French daily electricity load curves, PPC outperform several state-of-the-art predictive methods in terms of forecasting accuracy, coverage rate and average length of the predictive bands. For example, PPC achieve up to 2.8-fold of the coverage rate with much smaller average length of the predictive bands. The predictive quantile curves provide insightful information which is highly relevant to hedging risks in electricity supply management. This is a joint work with Xiuqin Xu, Yannig Goude, and Qiwei Yao. The paper is available at <https://arxiv.org/abs/2009.01595>