Nonparametric models for electricity load forecasting
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EDF R&D

Workshop leaders
Dr. Yannig Goude is a research-engineer at Electricité de France (EDF) R&D since 2008. He obtained his PhD in Statistics and Probability in 2007 at University Paris-Sud 11 Orsay. His research interests are electricity load forecasting, more generally time series analysis and forecasting, nonparametric models, combining algorithms for individual sequences.

Dr. Vincent Lefieux is head of Statistical Methods & Support group at Réseau de transport d'électricité/Transmission system operator (RTE/TSO). He received his Engineering degree from ENSAI and a Ph.D. in Statistics from Université de Rennes in 2007. His research interests are electricity load forecasting, iterative models and sparse representation.

Professor Eric Matzner-Lober is Professor of Statistics at Rennes University and affiliated researcher at Los Alamos National Laboratory, New Mexico. His research interests are nonparametric regression and iterative modeling. His applications are mainly devoted to energy and environment.

Outline

Electricity consumption is constantly evolving due to changes in people habits, technological innovations (computers, flat screens, smart phones….). Furthermore, open electricity markets and the development of smart grids induce the need for adaptive models that are able to fit various data sets (local consumption, aggregates of different customers…) and adapt immediately to changes.

In a first part of the day, we will present the contents of load forecast, including the objectives and periods. Influence of exogenous variables (such as temperature and price) for the short term forecast. Short review of methods used in different countries will be given.

After a quick overview of multivariate regression models, we will present nonparametric regression methods. In order to avoid the curse of dimensionality we will use iterative bias reduction technique to forecast the French load curve.

We will present different non-parametric models applied to different case studies (French consumption, data from the US distribution grid): GAM (Generalized Additive Models), CLR

(Curve Linear Regression) models, random-forest regression models. Then we will present the R package OPERA (Online Prediction with Expert Aggregation) that allows us to combine forecasts from these different models in an aggregated forecast that achieves interesting performances.

Prerequisites

Workshop participants will be assumed to know the software package R (www.r-project.org) and to have a background in statistics for time series or regression.

Participants should bring a computer with pre-installed R software at its latest release (see CRAN.R-project.org) and pre-installed mgcv and randomForest packages.

The course language will be English.

Location

The course will be held at
the University of Neuchâtel,
rue Breguet 2,
room R.113,
rez-de-chaussée,
10 min from the railway station.

Date and hour
Friday, January 23, 2015. From 9.00 to 17.00 with 1 hour lunch break.

Course fee
- CHF 250.-- for members of the Swiss Statistical Society, other applicants CHF 400.--.

The course fee includes printed documentation for personal use only, and drinks during the course.

The number of participants is limited to 25 with a minimum of 10.

Registration deadline
December 15, 2014

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Organiser

Sylvain Sardy, Université de Genève (sylvain.sardy@unige.ch)

Registration and further information

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