Online Parameters Selection for T-S Fuzzy Model based Short-Term Wind Power Forecasting

A.V. Zhukov[2], D.N. Sidorov[1,2], R. Li[3], F. Liu[3], Y. Li[3]
A.I. Dreglea[4], and D.A. Panasetsky[2]

[1] Hunan University, Changsha, China
yongli@hnu.edu.cn,
[2] Energy Systems Institute SB RAS, Irkutsk, Russia
dsidorov@isem.irk.ru,
[3] Central South University, Changsha, China
csuliufang@csu.edu.cn
[4] Irkutsk State University, Irkutsk, China
adreglea@gmail.com

The wind power forecasting is challenging problem due to the impacts of wind speed and direction, temperature and pressure which all have uncertain nature. The objective of this contribution is to enhance a wind power short-time forecasting method [1] based on the T-S fuzzy model, which does not rely on a large amount of historical data and can linearize the complex nonlinear process to obtain accurate results. In [1] we proposed method, the main affecting factors are selected by means of the correlation analysis for wind power prediction. In this talk an efficient procedure of online parameters selection is employed. The efficiency of proposed approach is demonstrated comparing with the EMD-SVM methods. The results show that the proposed models can effectively improve the precision of the short-term wind power forecasting. The datasets from China and Ireland are employed.

[1] Fang Liu, Ranran Li, Yong Li, Yijia Cao, D. Panasetsky and D. Sidorov, "Short-term wind power forecasting based on T-S fuzzy model," 2016 IEEE PES Asia-Pacific Power and Energy Engineering Conference (APPEEC), Xi'an, 2016, pp. 414-418.
[2] Zhukov A., Sidorov D., Foley A. Random forest based approach for concept drift handling //arXiv preprint arXiv:1602.04435. – 2016.