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## Transformer-based federated learning for secure short-term load forecasting in smart grids

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Electricity load forecasting is an essential task within smart grids to assist demand and supply balance. While advanced deep learning models require large amounts of high-resolution data for accurate short-term load predictions, fine-grained load profiles can expose users' electricity consumption behaviors, which raises privacy and security concerns. One solution to improve data privacy is federated learning, where models are trained locally on private data, and only the trained model parameters are merged and updated on a global server. Therefore, this paper presents a novel transformer-based machine learning model for short-term electricity load prediction based on federated learning. Further, we compare our forecasting performance to other state-of-the-art Long-Short-Term-Memery models and convolutional neural networks based on a dataset from a german university campus. Results show that transformer-based forecasting is a promising alternative to state-of-the-art models within federated learning.

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