Call for papers - Special Issue
Machine learning and deep learning for time series analysis

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Background and motivation:

Time series analysis have been an object of interest in various fields, such as engineering, economics, medicine, or humanities. Conventional methods for time series manipulation are summarized in Hamilton (1994). Moreover, traditional machine learning-based methods for time series analysis can be found in Tang et a. (2022).

Most studies using machine and deep learning to analyze time series focus on modelling and prediction. As an example, authors in Adusei et al. (2022) dealt with modelling of municipal waste disposal behaviors in relation to meteorological seasons using recurrent neural networks, and Bhoj et al. (2022) proposed an architecture for a robust hybrid deep learning model which can be used for the granularity of data to make accurate predictions of energy consumption of homes.

Nevertheless, classification and anomaly detection are also not uncommon for use in time series analysis. Chen et al. (2021) introduced the combination of a multi-scale neural network and an attention mechanism for time series classification. Moreover, the team of Julien Audibert reflect on the benefits of deep networks for anomaly detection (2022).

As a summary, the field of machine learning and deep Learning has attracted a lot of interest in the past few years. A comprehensive survey of the entire record of improvements that led the topic to its current state-of-the-art can be found in Schmidhuber (2015). A higher attention on the novelties from the last years is provided in Lin et al. (2022). In this special issue, we proceed to improve the potential of machine learning and deep learning models in time series analysis, with a focus on applications such as sales forecasting, inventory analysis, stock market analysis, price estimation, feature extraction, and decision support.

Topics of interest in this special issue include (but are not limited to) the following methods and tools.

- Preprocessing or fusion of time series data
- Mapping, monitoring, and characterization of dynamical systems with time series
- Machine learning and deep learning models for time series analysis and time series processing
- Feature extraction from big datasets
- Probabilistic forecasting using deep learning, temporal fusion transformers, explainable time series forecasting

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