Machine Learning for Time Series Data

Module SAFI-M8-TS

Overview

This intensive CPD course is designed for industry professionals working across business, engineering, project and product lifecycle management roles. It provides a fast-track route to acquiring practical skills in the applications of machine learning techniques to diverse problems and use cases, involving time series data, building AI applications for real business impact.

The course was developed and validated in close collaboration between experienced academic and industry professionals from the global automotive and aerospace sectors (the SAFI consortium), ensuring the curriculum fully reflects current industry best practice in skills and capability development.

Learning Outcomes

- Perform effective data handling, visualization and preprocessing tasks to identify patterns, and feature extraction using a range of methods
- Select and implement appropriate machine learning algorithms including regression, classification, clustering and deep learning for time series tasks
- Skills in practical use of Python toolboxes, implementing workflows and methodologies appropriate for the data and problem context
- Interpret and explain results to a range of audiences including non-specialists, lead effectively industrial AI implementation

Pre-requisites

Prior attendance of SAFI M6-1 “Statistics & Data Science for Industry” is recommended, or equivalent knowledge and experience with statistical learning and data analytics application, along with basic Python coding skills.

This course is intended for professionals who:

- Wish to gain practical skills in machine learning for intelligent industrial applications
- Want to leverage AI and data-driven modelling for business decisions and applications
- Are looking to upskill with a structured, industry-validated and Qualiopi accredited course

Registration and enquiries: info@aste.asso.fr
99 bd de la Reine – 78000 VERSAILLES + 01 61 38 96 32

Programme

Foundations and exploratory analysis of time series data

- Introduction to time series data analysis in an industrial context
- Time series data handling, visualisation and preprocessing to identify patterns, trends, seasonality and anomalies
- Feature extraction and basic signal processing (FFT and power spectra, digital filters)
- Transfer functions for predictions

Time series data modelling and forecasting applications

- Classic time series models for stationary and dynamic data (autocorrelation, ARIMA, forecasting)
- Machine learning for time series data (lag features, rolling stats)
- Deep learning and anomaly detection in time series data (RNN, LSTM, autoencoders, transformers)

Mini Project

- Independent practice through application to a relevant industrial time series problem

Course experience

The **3-day** course is delivered in a workshop format, with an approximate 40/60 split between technical sessions and hands-on tutorials and exercises.

Practical engineering case studies provide the context for explaining key concepts and the application of methods and algorithms. Daily technical keynotes from industry experts provide real-world context of application.

“Open” courses are delivered on line.

Fee SAFI Members: 1 250 €, ASTE Members: 1 750 €, Public Fee: 2 200 €

On site “Closed” delivery available.

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