

Big Data Analytics in Smart Manufacturing

Course Objectives

- Address production challenges:
 - Improve Overall Resource Efficiency
 - Increase Machine Availability
 - Demand Forecasting
- Address analytical challenges:
 - Equipment and process complexity
 - Process dynamics
 - Data quality
 - Visualization
- After the training, students will have the ability to:
 - Perform all common data preparations
 - Build sophisticated predictive models
 - Evaluate model quality with respect to different criteria
 - Deploy analytical predictive models
 - Recognize BDA as an enabler for providing a picture of what has happened, what is happening right now, and what will happen tomorrow and in the future.

Description

Manufacturing is one of the largest industry with huge amount of data that may just sits on the floor, and the amount of data will get even greater with the implementation of Industrial Internet of Things (IIoT). However, just having vast quantities of data at hand doesn't mean one can extract the needed insights. Therefore, the key deliverables of this course – the predictive analytical methodologies to turn big data into useful information, than is, in turn, the key to sustainable innovation in a smart manufacturing environment.

In this 3-days course, we will walk you through multiple big data analytics use cases in the manufacturing industry, via hands-on exercises advanced analytics techniques.

Target Audience

This course is suitable for those work on operational data analytics for improvement opportunities.

Training Outline

[Overview](#)

- The relevance and importance of Industry 4.0
- How Big Data Analytics play in the role to achieve Industry 4.0 and Smart Manufacturing?
- What could be done with Big Data Analytics to solve business problem?

[Basic Usage](#)

- Introduction to User interface
- Creating and handling repositories
- Starting a new project
- Operators and processes
- Loading data
- Storing data, processes, and results

[Data Cleansing and Preparation](#)

- Normalization and standardization
- Basic transformations of value types
- Handling missing values
- Sampling
- Filtering examples and attributes
- Handling attribute roles
- Joining Data from different Sources

[EDA: Exploratory Data Analysis](#)

- Data Types
- Quick Summary Statistics
- Visualizing Data
- Charting

[Building Better Processes](#)

- Organizing
- Renaming
- Relative Path
- Flow Control
- Subprocesses
- Breakpoints

[Predictive Models](#)

- K - Nearest Neighbour
- Naive Bayes
- Linear Regression
- Decision Trees
- Optimization
- Importance of attributes - Feature Selections

[Model Evaluation](#)

- Applying models
- Splitting data
- Evaluation methods
- Performance criteria

[Model Application](#)

- Scoring on new set of data

[Sharing and Collaboration](#)

- Deployment Server
- Automation

[Analytics to Visualization](#)

- Introduction to dashboard building elements
- Data filtering, formatting, sorting, set and grouping
- How to share interactive reports with others
- Creating a dashboard for visual analysis

Prerequisite

Basic knowledge of computer programs and mathematics.