

Predictive Maintenance with MATLAB

OEM: MathWorks • Duration: 2 Days (16 hrs) • Code: MW-PREDICTIVE-MAINTENANCE-WITH-MATLAB

COURSE MODULES & TOPICS

Day 1 of 2

Importing Data and Processing Data

- Store data using MATLAB data types
- Import with datastores
- Process data with missing elements
- Process big data with tall arrays

Finding Natural Patterns in Data

- Find natural clusters within data
- Perform dimensionality reduction
- Evaluate and interpret clusters within data
- Anomaly Detection

Building Classification Models

- Classify with the Classification Learner app
- Train classification models from labeled data
- Validate trained classification models
- Improve performance with hyperparameter optimization

Day 2 of 2

Exploring and Analyzing Signals

- Import, visualize, and browse signals to gain insights
- Make measurements on signals
- Compare multiple signals in the time and frequency domains
- Perform interactive spectral analysis
- Extract regions of interest
- Generate MATLAB scripts for automation

Preprocessing Signals to Improve Data Set Quality and Generate Features

- Use resampling to handle nonuniformly sampled signals

- Fill gaps in uniformly sampled signals
- Perform resampling to ensure common time base across signals
- Use the Signal Analyzer app to design and apply filters
- Use File Ensemble Datastore to import data
- Use the Diagnostic Feature Designer app to automatically generate and rank features
- Perform machinery diagnosis using envelope spectrum
- Locate outliers and replace with acceptable samples
- Detect changepoints and perform automatic signal segmentation

Estimating Time to Failure

- Select condition indicators
- Use lifespan data to estimate remaining useful life using survival models
- Use run-to-threshold data to estimate remaining useful life using degradation models
- Use run-to-failure data to estimate remaining useful life using similarity models