



Analysis

Monitoring

Diagnostics

# Practical CBM

Powered by Pattern Search AI  
and a Robust Library of  
Diagnostic Codes



## DIGITAL TRANSFORMATION

Condition-based monitoring (CBM) is about identifying predictive patterns in granular machine data and looking for reoccurrences of those patterns to prevent failures, reduce downtime and eliminate inefficiencies

### **A New Self-Service Platform for Practical CBM**

Trendalyze is an analytics and monitoring platform that allows human experts to find the patterns in granular time series data that precede operational failures. The platform can then monitor real-time data for the predictive patterns that precede operational failures, down-time and loss of productivity.

Trendalyze is built for the operators and engineers who understand and manage industrial processes, who need to investigate root causes, and who want to monitor, detect, and predict actionable signals within massive amounts of sensor data. Our CBM solution empowers operations experts and engineers with:

1. An intuitive set of self-service tools to visualize, analyse and search for predictive patterns,
2. A powerful platform capable of monitoring and processing large volumes of data in real time , and
3. A rich library of diagnostic codes that allows rapid and accurate identification of failure modes, causes and actions.

## The Need for A New, Practical Approach to CBM

The Internet of Things (IoT) and SCADA are some of the most efficient and cost-effective tools in the Industry 4.0 revolution. However, their capabilities are being sub-optimized when it comes to gaining insights and monetizing historical operational data.

SCADA systems systematically collect large volumes of granular time series machine data that contain anomalous signals and early warning signs. The SCADA time series data typically contains millions of data points making human analysis time-consuming and therefore limiting how much insight can be extracted from that data.

Traditional machine and deep learning techniques involve high initial investment in time and costs with elevated computational loads and results that are difficult to interpret.

An alternative approach is to augment human expertise with simple pattern mining techniques to ensure that all of the available insight can be quickly and efficiently squeezed from the available data.

Trendalyze provides the algorithms that help operators and engineers find and reliably monitor motifs in massive time series databases, eliminating the time, cost and other challenges of machine learning.

## How Is Our Approach Different?

For CBM, it is important to realize how something can fail (its failure modes) in order to be able to infer that a failure is happening from sensor data. Hence, CBM pattern recognition is grounded in math and physics and not in empirical statistics.

Practically speaking, machine learning requires thousands of examples of a particular failure pattern in order to learn how to detect that pattern in the future. But who is willing to let a machine fail hundreds of times in order to train a model to predict it once? If a failure pattern has been observed even once in the past, and if the variations of a pattern can be mathematically derived, users will be able to search for failures within any data set and learn what each failure mode looks like in advance. This approach shortens the time required for an organization to derive results from their CBM efforts.

To further accelerate the time to results, a library of known failure modes and the associated signal motifs removes the necessity for operators and engineers to discover each potential failure individually and to define the appropriate action to be taken. By starting with a library of hundreds of devices and their associated failure modes our approach makes the interpretation of predictive signals and the required corrective action much quicker and more reliable.

Includes a library of over 150,000 failure patterns from sensor data for asset and component classes across every industry