



Leading equipment manufacturer reduces operational costs with a preventive maintenance solution for robotic arm using iFusion™ platform

Client Need

Client is a leading equipment manufacturer of all types of conveyors, carousels and high speed monorail systems for multiple industry verticals.

Client needed advanced analytics solution to predict the equipment failures and thereby enhance the performance of the manufacturing facility.

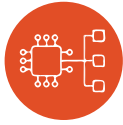
What We Did

Built a preventive maintenance solution using iFusion™ platform that enables component level diagnosis and provides early warning notifications before significant time of failure.

- Leveraged the data gathered from disparate data sources to predict abnormal performance of the robotic arm
 - Acceleration data from accelerometer
 - Tension and noise vibration from pick up coil
 - Power and current from induction cable
 - Voltage and power from power supply panel
 - Wattage from power receiving unit
- Utilized the performance trend data and operational metrics to identify remaining useful life, maintenance cycle, preventive maintenance and real-time performance metrics



> Identified the patterns of abnormal system performance in the movement of robotic arm



Determined the anomalies over cycle time using unsupervised clustering-based techniques



A Gaussian Mixture Model (GMM) was trained on first two days of data and then was used to predict on remaining data



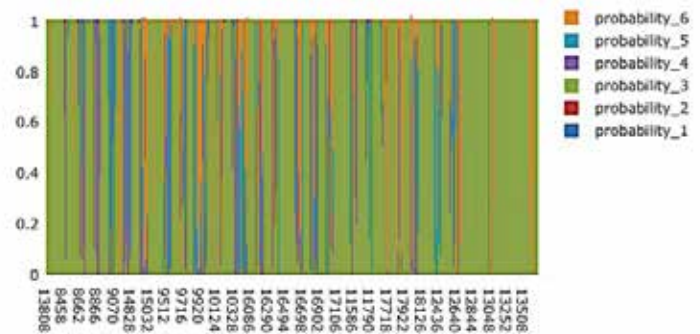
An anomaly is detected if the new data does not belong to any cluster (if probability of all mixture components < 0.5)

What the Client Gained

- Decreased unplanned downtime and enhanced utilization of equipment
- Improved reliability, safety and performance of the equipment
- Reduced operations cost and maintenance expenditures

Predictions on New Data - Clustering and Anomaly Detection

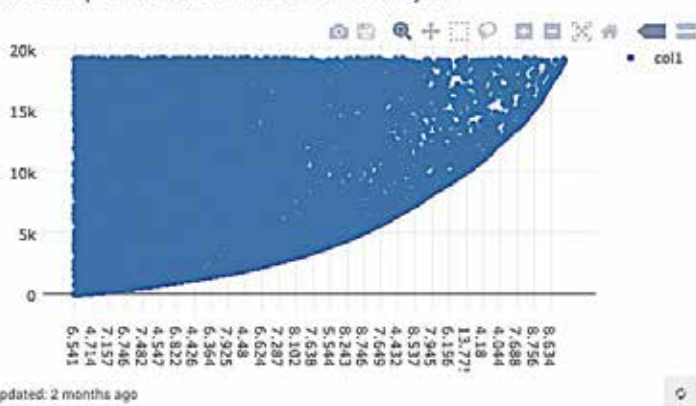
A GMM was trained on first two days of data on the odd cycles and then was used to predict on the remaining data. Those cycles where the probability of all mixture components are less than 0.5 for example can be treated as anomalies



Plot of Time Differences between Cycles

Scatter Plot of Time Differences in Cycles

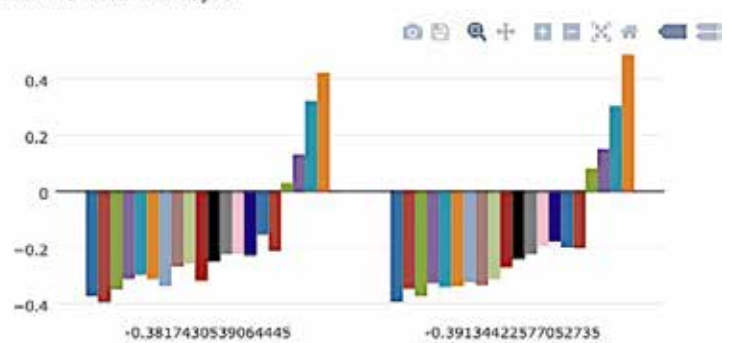
This chart plots the time differences between cycles



Average Comparison

Comparison of average accelerations of first two days with rest of the days

This query compares the average acceleration values for the first two days with the rest of the days



About Innominds

Innominds is an AI-first, platform-led digital transformation and full cycle product engineering services company headquartered in San Jose, CA. Innominds powers the Digital Next initiatives of global enterprises, software product companies, OEMs and ODMs with integrated expertise in devices and embedded engineering, software apps and product engineering, analytics and data engineering, quality engineering, and cloud and devops, security. It works with ISVs to build next-generation products, SaaSify, transform total experience, and add cognitive analytics to applications.