

Battery Failure Prediction

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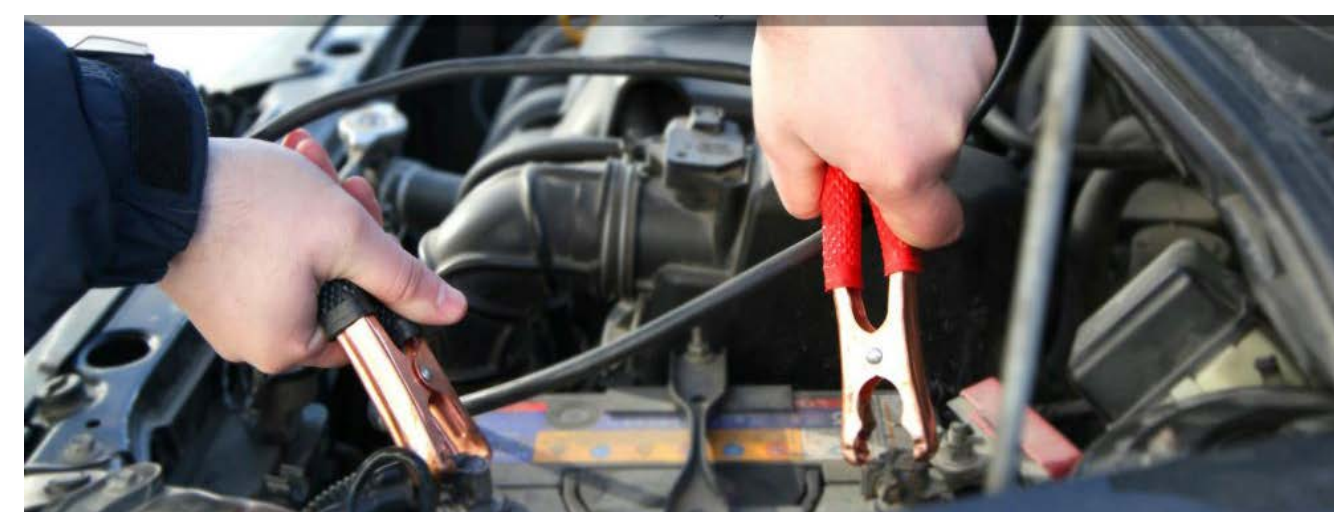
ECCOMOBILITY (ORF) &
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Battery Failures On the Road

One of the most common issues that many companies suffer from is the failure of the batteries of their fleet vehicles. This results in:

- Loss of business.
- Adverse reputation.
- Towing expenses.
- Labour expenses.

Those expenses add up to millions of dollars every year.

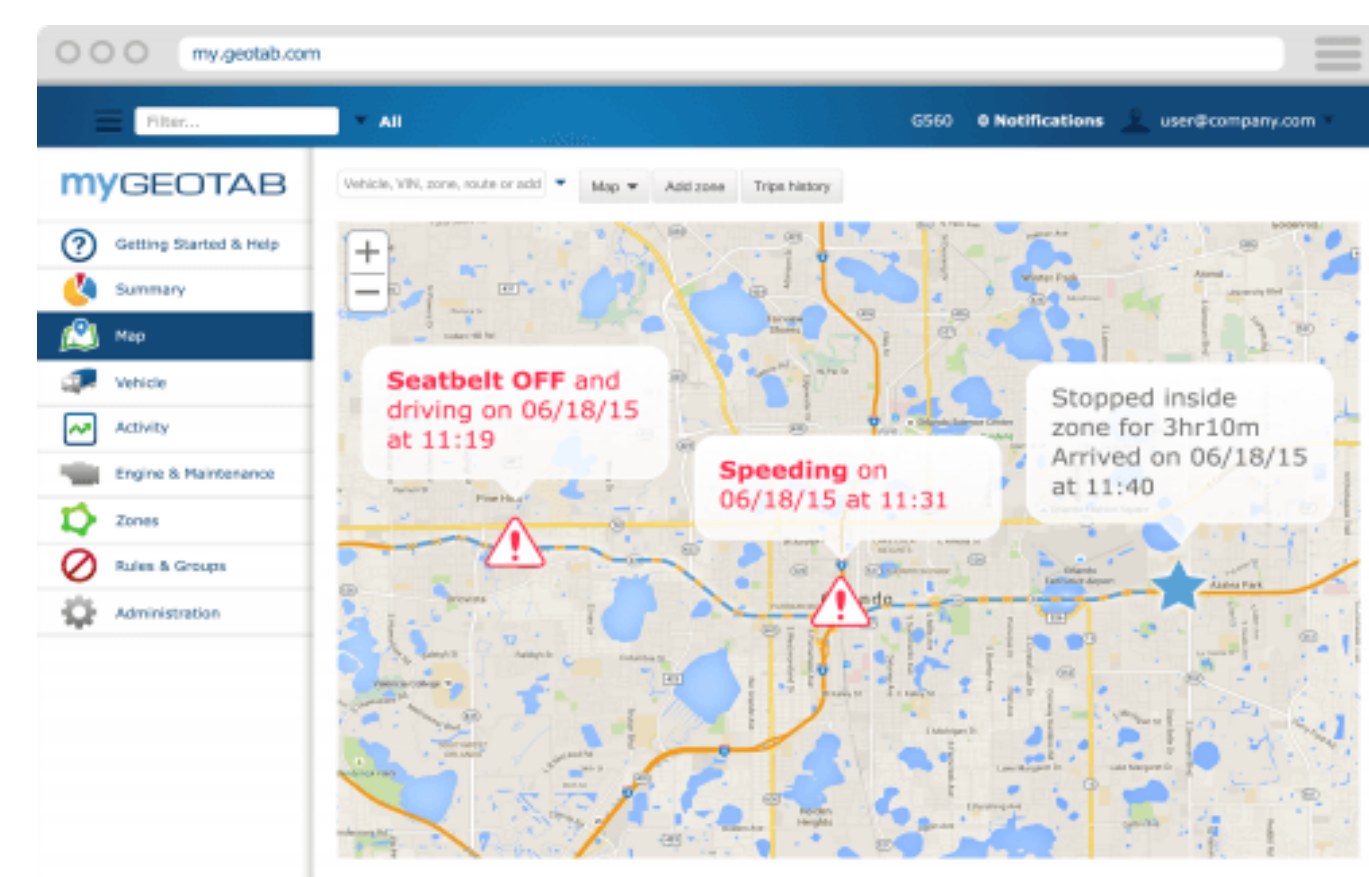


Our Industry Partner

Predictive maintenance is extremely valuable to the commercial vehicle fleet industry and to our industry partner Geotab that produces telematics systems for their 1 million subscribers. Geotab is a global leader in telematics, providing end-to-end telematics technology and full-featured GPS fleet management solutions to businesses of all sizes.

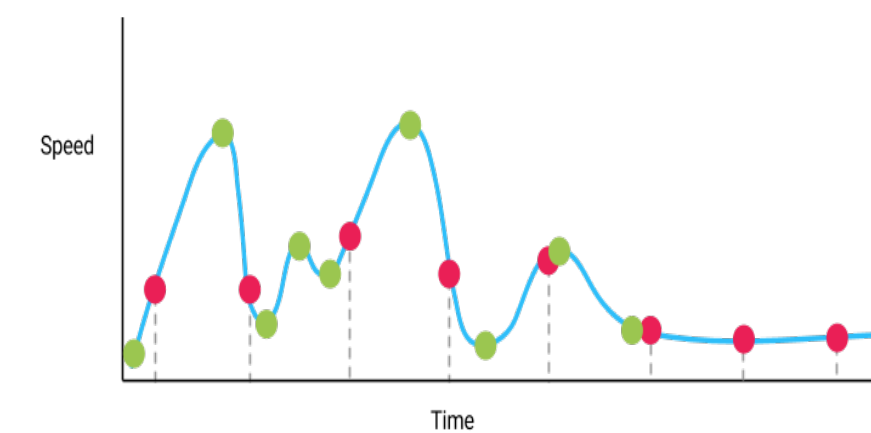


It collects over 2 billion data points per day of engine data and GPS data through their own small yet powerful GO device. The collected data can be visualized through their own software MYGEOTAB.



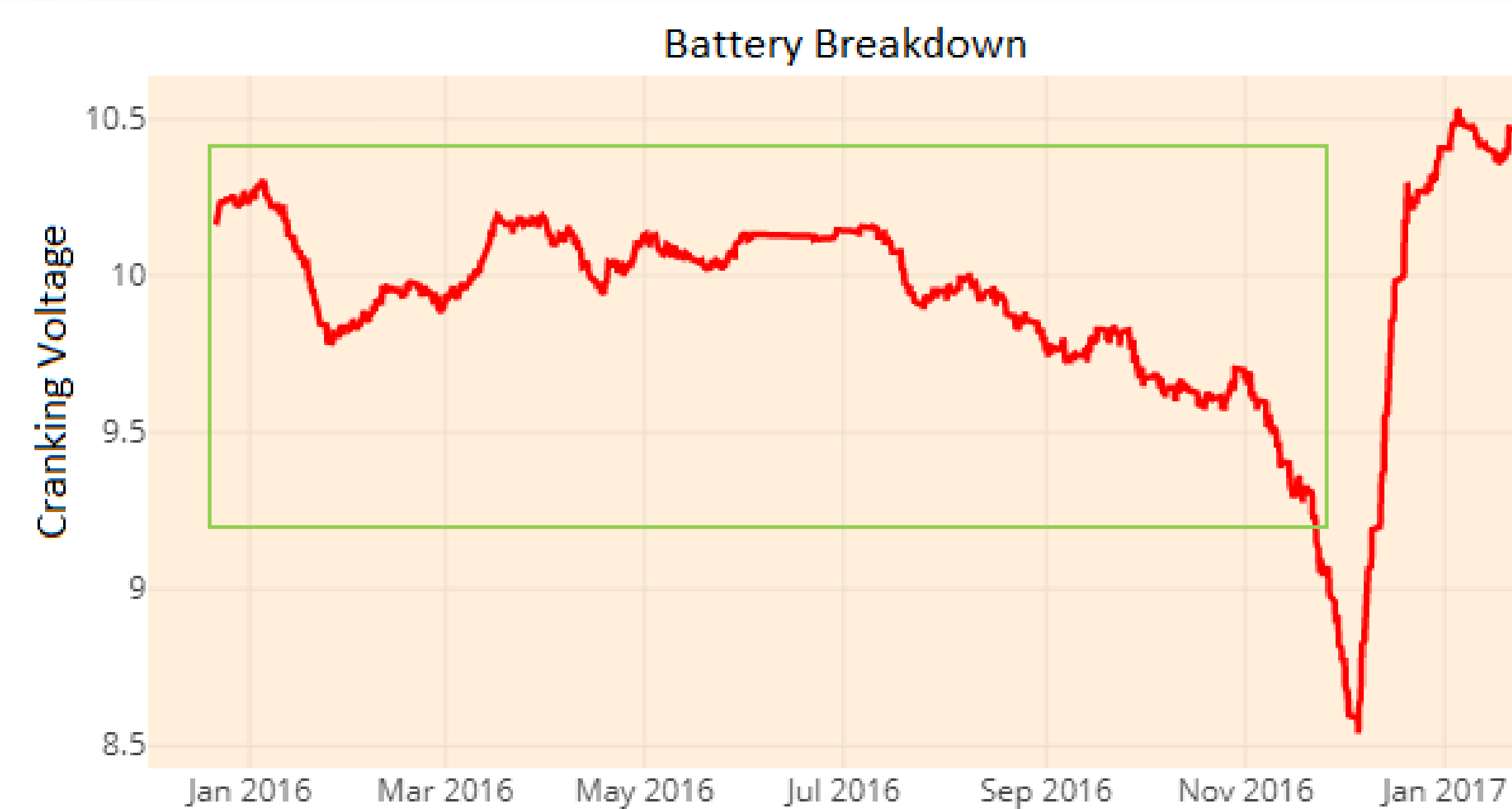
Collecting Historical Data & Repair Logs

The GO device's Curve-Based Logging algorithm is an intelligent patented algorithm that decides when to record data in order to log the essential points and discard redundant points. The blue curve represents the actual data measured. The red dots represent a simple time-based sampling, which misses important points. The green dots represent only the most relevant data points as recorded by Geotab's method.



The highest possible number of battery repair logs was collected from Geotab's customers including the date and time when the breakdowns happened, as well as the description of the breakdowns.

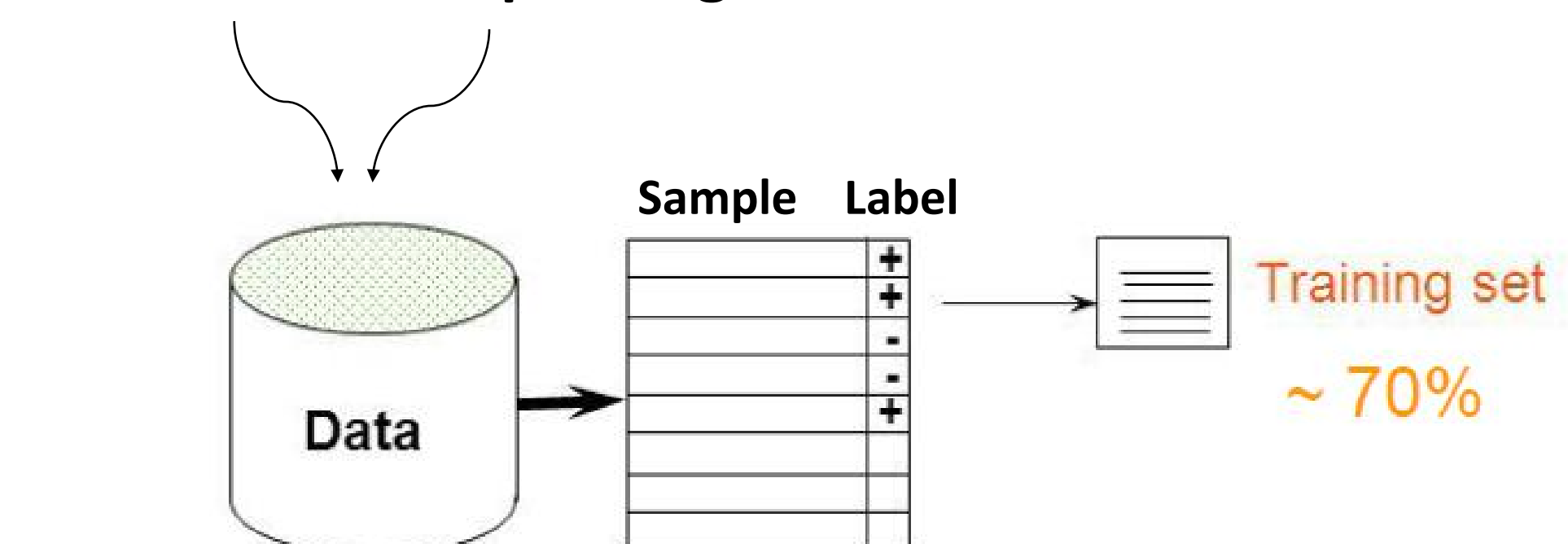
Solution: Machine Learning



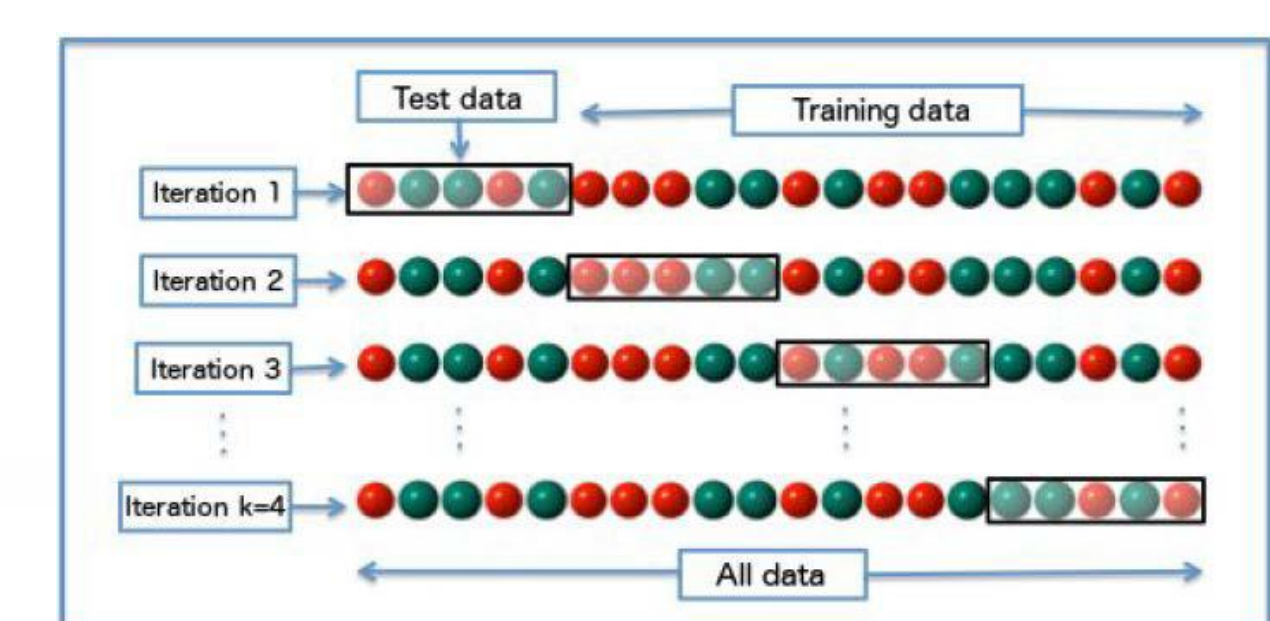
We have developed a Machine Learning model that can learn from historical battery breakdown curves and generalize rules that define a failing curve pattern. The model is trained only on the data points up to few days before the failure so that it can detect similar patterns to predict battery failures.

Data Processing

GO device + Repair Logs



Cross Validation



Battery Failure Prediction

The labeled data containing both good samples and breakdown samples feed the ML model. The model extracts mutual features from each class and compares them to the features of the testing sample. It predicts an upcoming failure if the curve is significantly degrading like in the breakdown samples.

