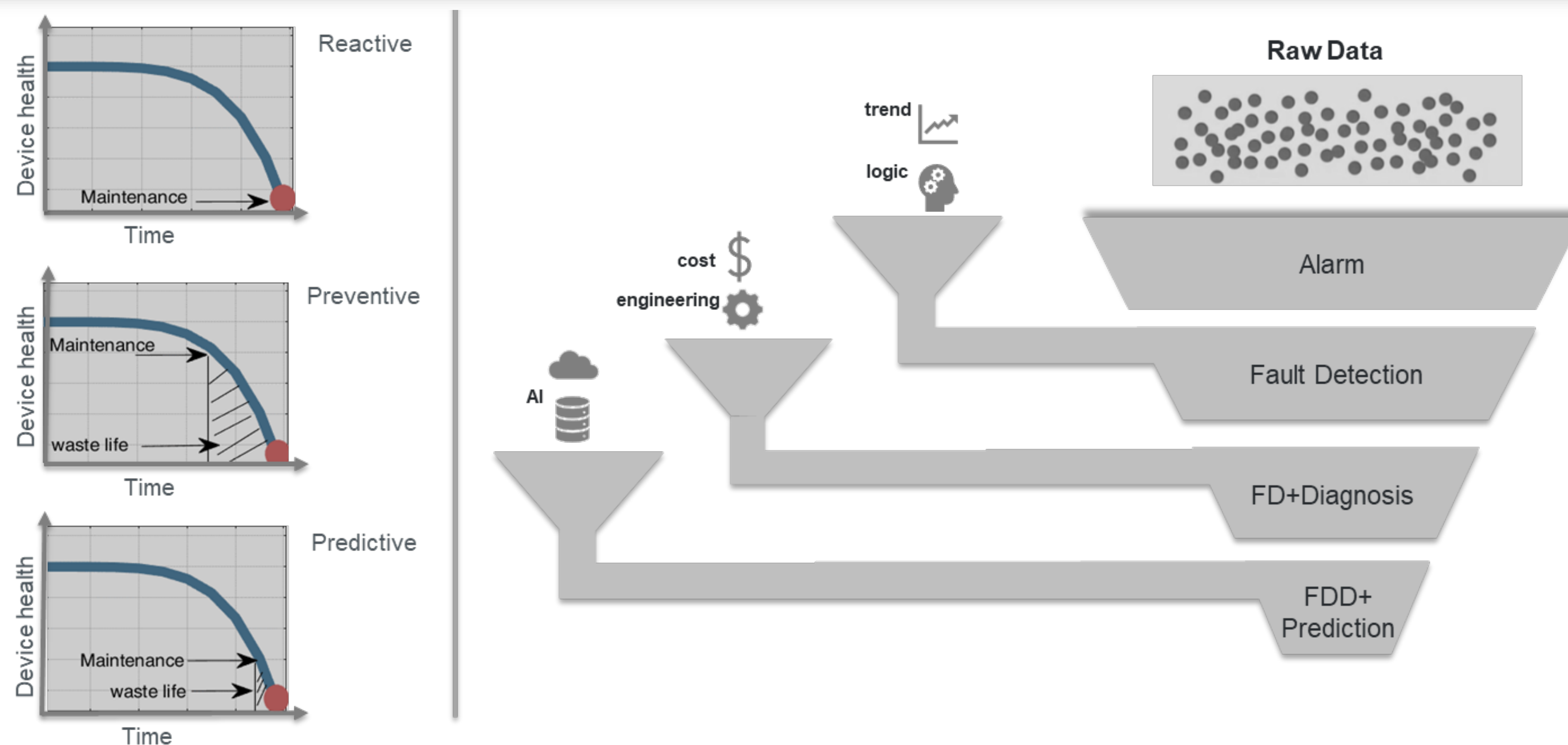


Method

Centre for Mechatronics and Hybrid Technology
Mechanical Engineering McMaster University
Hosna Geraei

Introduction



How Does Signal-Based FDD Work in Rotary Machines?

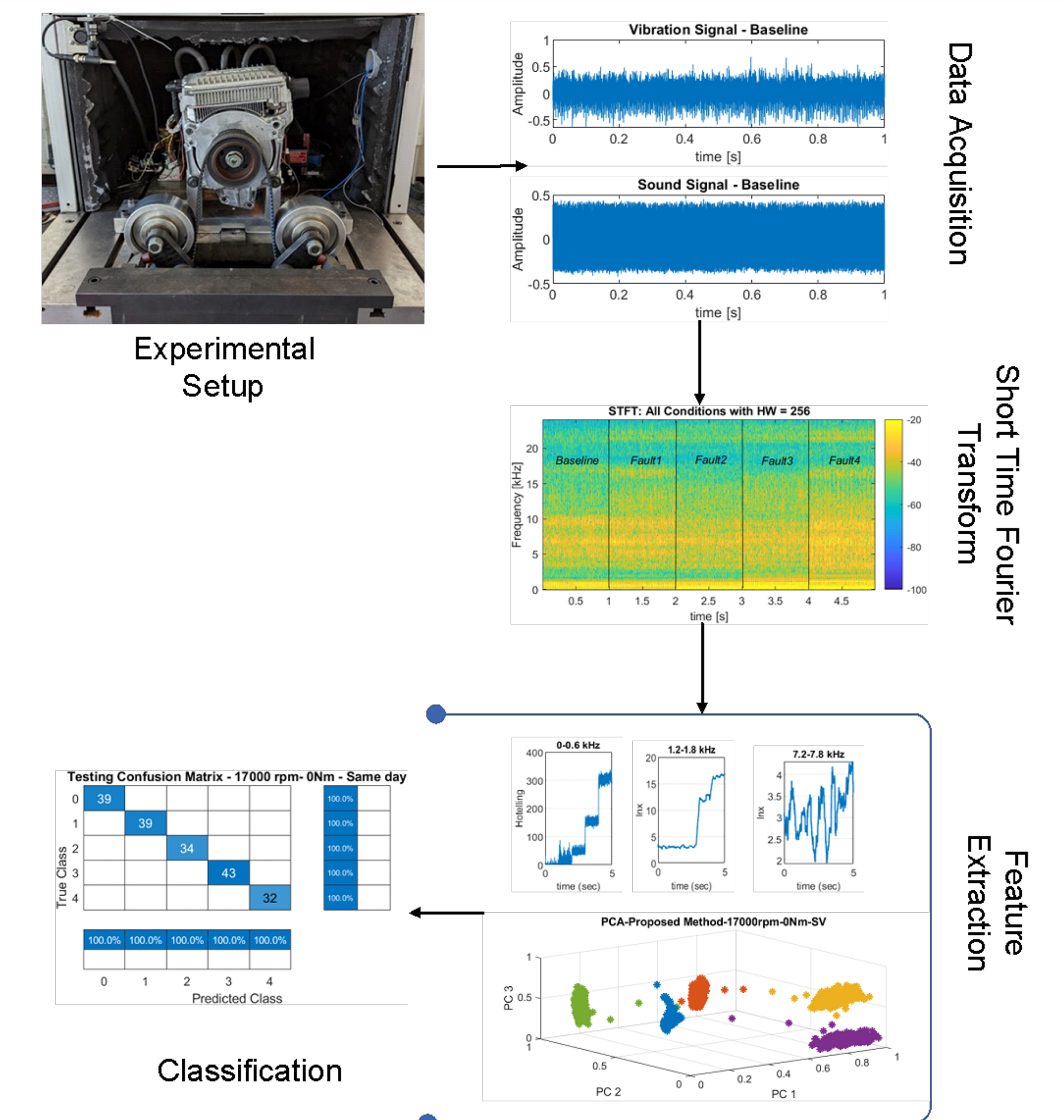
Step 1 Connection and Data Engineering	Step 2 Feature Engineering	Step 3 Data Model and FDD outputs
<ul style="list-style-type: none"> Sensors Data Selection Sourcing Synthesis Cleaning Centering Scaling 	<ul style="list-style-type: none"> Most algorithms do not work correctly on real experimental data with high variability. CMHT's feature extraction method extract invariant within noisy datasets. 	<ul style="list-style-type: none"> Model Selection Training Evaluation Tuning Monitoring Retraining Value

CMHT's Feature Engineering Method

This method consists of three main steps:

1. Short-Time Fourier Transform (STFT)
2. PCA-based Multivariate Statistical Process Control (MSPC) with a sliding window
3. Statistical analysis

The PCA-based hoteling represents the estimated squared Mahalanobis distance from the center of the in-control subspace to the projection of new observation onto this subspace.



Classification Using Support Vector Machine

- SVM works by optimizing the margin of a set of data and separating it neatly using a separating hyperplane.
- The support vectors are the data points that are closest to the separating hyperplane.

