**MCSA** involves analyzing the current signature of a motor to detect changes in its characteristics, which can indicate the presence of faults such as rotor bar breakage, bearing wear, and misalignment. The technique is based on the fact that the current drawn by a motor is affected by the condition of the rotor and stator windings, as well as the load on the motor. By analyzing the frequency spectrum of the current signal, it is possible to detect changes in the signature that are indicative of specific types of faults.

If there will be any defect in the motor or mechanical component that can be seen in the current waveform.

The approach taken here is that all the peaks(maxima) and crests(minima) are noted for the waveform. Then these points are studied and the outliers among them are given the possibility of carrying defects.

One important point to note here is that the current signature for the normal working of the device is not given. Hence, we cannot be sure that the changes in the current signature are exactly defects or some other activity. But yes, we can be sure that if the current signature is changing then obviously some or the other activity is happening.

**Dataset**: The dataset has observations of a 3-phase AC motor(3.2hp).

The model-making and accuracy estimation is done using a **random forest classifier**.

**Please note before predicting the faults in the new data, it has to go under preprocessing which includes smoothening and finding the peaks and crests of the smoothened waveform.**