Electric motors data analysis

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ABB

Dataset

- Measurements of torque and current from electric motors
- Time-series data with frequency 20KHz
- Data taken from 5 distinct motors in AC and DC modes
- Each data sample is one recorded operation
- Operations are recorded while motor is working properly, then a fault is induced and the same operations are recorded again
- In total 1066 AC samples, 924 DC samples

Data Example

Torque	Current
16.693	0.023
16.739	0.019
16.823	0.010
16.810	0.007
16.823	-0.002
16.849	-0.010
16.992	-0.018
17.108	-0.033
17.290	-0.035
17.297	-0.052

Main Goals

3 main goals:

- ▶ Motor Classification
  Can we identify a motor by a recorded operation?
- ▶ Fault Classification
  Can we group faults?
- ▶ Fault Prediction
  Can we predict the state of motor by a recorded operation?

First Steps

First problem — data is very high-dimensional ($p \approx 10^5$)
Solution — do PCA first to select the most important moments

Then — data exploration
For example, do faulty and working operations have the same or different
mean, distribution etc

PCA

PCA results go here

Data Properties

Things like mean, covariance, distribution etc

Conclusions

What we got so far

Questions?