Sales pitch

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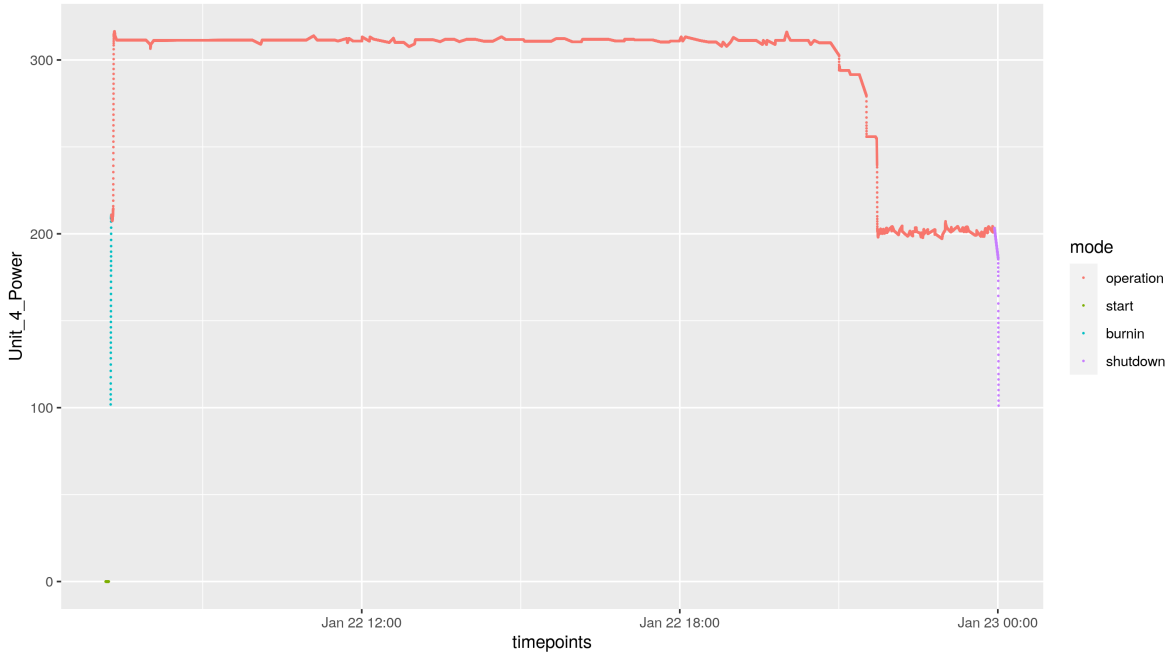
Overview

Data findings

- High correlation
- Jump in strain after burnin
- Strain on bolt increase with time, at least for variables near the crack
- Apparent non-stationarity (tried to remedy this by splitting into test data set with consecutive blocks of test/error of 200 seconds each)

Augmentations

- Burn-in and shutdown modes.



- Seconds since end of burn-in.

Model considerations

We have used a simple linear regression model for each bolt seperately, with features being all possible interactions between the following variables: - timepoints
- Unit_4_Power - Turbine_Guide_Vane_Opening
- Turbine_Pressure_Drafttube - Turbine_Pressure_Spiral_Casing - Turbine_Rotational_Speed - mode - length since last startup

We have also included two additional "modes" as a pre-processing step: "burnin" and "shutdown".

Model considerations

The linear model is simple, with its only flexibility coming from the vast number of interactions

- Crossplots reveal that many relationships are linear or near-linear, and adding transformations of features has not improved prediction

Putting it into production

- Mention re-training?
- Very fast prediction of new data points (only a linear combination)

Scalability and transferability

- Scalability: yes, this is scalable. However, a problem is that the model is not re-trained on new data points.
- Could consider re-training the model with robust regression

Other things to do

- Possible smoothing of signal
- Fit robust models
- Anomaly detection