



Project Title:	A Track Degradation Model
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Project Description:

Rail maintenance actions are usually reactive which means after defect has been identified rather than predicted have been typically based on use of exceedance thresholds. In which case, each measurement is compared against a pre-set threshold such that if it exceeds the threshold then maintenance is done. To the best of our knowledge, no previous work has attempted to model the relationship between data variables, or use historical data for the purposes of predictive maintenance.

Rail track parameters are poorly understood. This is mainly because they are never explained in literature. This ambiguity in both rail track modalities ie. rail profile and track geometry creates further misunderstanding.

To answer this, each parameter in both modalities was thoroughly explained, and illustrated where necessary. Once the parameters are understood, their behaviour or relationship with the rest of the parameters can then be explained by the extent to which they are correlated with each other. This correlation helps in understanding behaviour of each parameter with other parameters in both modalities across the base files.

One main purpose of this study is to understand the relationship between variables both modalities, as well as for modelling their changes with time in order to predict their future values. All strong relationships found are then analysed for causality, and the performance evaluation of our modelling is discussed on a range of UK rail network data.

Another aim is to develop a predictive maintenance model for forecasting future changes in measurements that will cause alarm. This model will be based on correlation analysis carried out in the first instance of both rail profile and track geometry. It would linear regression and non linear regression carried on through neural network.