

Extracting Failure Insights from Fault and Maintenance Reports with Palifer

Introduction

Palifer automatically extracts failed components from thousands of operator-filed fault and maintenance reports. This allows for analyzing component failure incidence via MTBF calculation, predicting material usage, evaluating OEM performance, and for identifying and prioritizing crucial maintenance tasks. We are currently working with Deutsche Bahn Netze Maschinenpool to improve on their Gleisbaumaschine, Gleisarbeitsfahrzeug (**incl. Plasser & Theurer DB Baureihe 746**), and Instandhaltungsfahrzeug für Oberleitungsanlagen fleets.

Time savings

Previously, fault and maintenance reports were either left unused or processed manually by an engineer spending months reading through thousands of individual reports. For Deutsche Bahn (Netze), labelling their fault reports was a multi-year project to find out component failure incidence to evaluate their current maintenance performances.

Using Palifer, Deutsche Bahn was able to cut down on their labeling time from five minutes per report down to around three seconds, a 10,000% improvement. Given the volume of reports from their fleets and the inefficiencies of current processing methods, Palifer was able to cut down report processing time from 6 months to a few minutes at a 91% accuracy rate. The accuracy comes from selecting the top 5 results from a pool of over 1,600 possible components.

Technology

Palifer uses a state-of-the-art natural language processing (NLP) AI algorithm that automatically reads operator-filed fault and maintenance reports. From there, the algorithm extracts the mentioned components from an existing component asset tree using both keywords and semantic meaning of the reports.

The usage of semantic meaning allows us to extract components that do not perfectly match to a keyword on the component tree. This allows it to work regardless of grammar, shorthands, and spelling mistakes. Palifer also works on multiple train fleet types with minimal model retraining.