

eRCM

RAILWAY CONDITION MONITORING

Your partner in **SAFE** and **EFFICIENT** railway transportation

ABOUT EVOPRO

evopro group is an international engineering company that provides comprehensive engineering services and develops innovative products in various industries worldwide, with a focus on transportation technologies, energy and industrial automation.



MISSION & SOLUTION

evopro has created state-of-the-art and cost-effective solutions to help the stakeholders of the railway transportation ecosystem overcome the challenges of providing safe and efficient transportation.

Integrating the most advanced measurement and telecommunication technologies, evopro offers its **Railway Diagnostic** product line, including the **eRCM – Railway Condition Monitoring Service**.

INCREASED SAFETY

Detection and alarm on derailment-hazardous (dangerous) dynamic load conditions of the passing trains.

OPERATING COST REDUCTION

Detection, trend-monitoring and alarm on railcar-, and infrastructure-damaging conditions of the passing train that results in:

- **The preservation and lifetime extension of both the infrastructure and the rolling stocks** by reduced and controlled wear and tear.
- **Decreased maintenance costs by predictive maintenance** based on the provided trend-data.

BUSINESS EFFICIENCY AND PROFITABILITY

- **Effective traffic management** due to adaptive speed limitations, based on the detected dynamic load conditions.
- **Increased utilization by predictive maintenance** based on the provided trend-monitored data.
- **Increased income by selling trend-monitored data** for predictive maintenance purposes to other parties of interest.
- **Quality-based tolls and payments** based on the provided trend-monitored data.

ENVIRONMENTAL PROTECTION

Controlled noise-, and vibration-emission using defective wheel detection and trend-monitoring.

ADVANTAGES

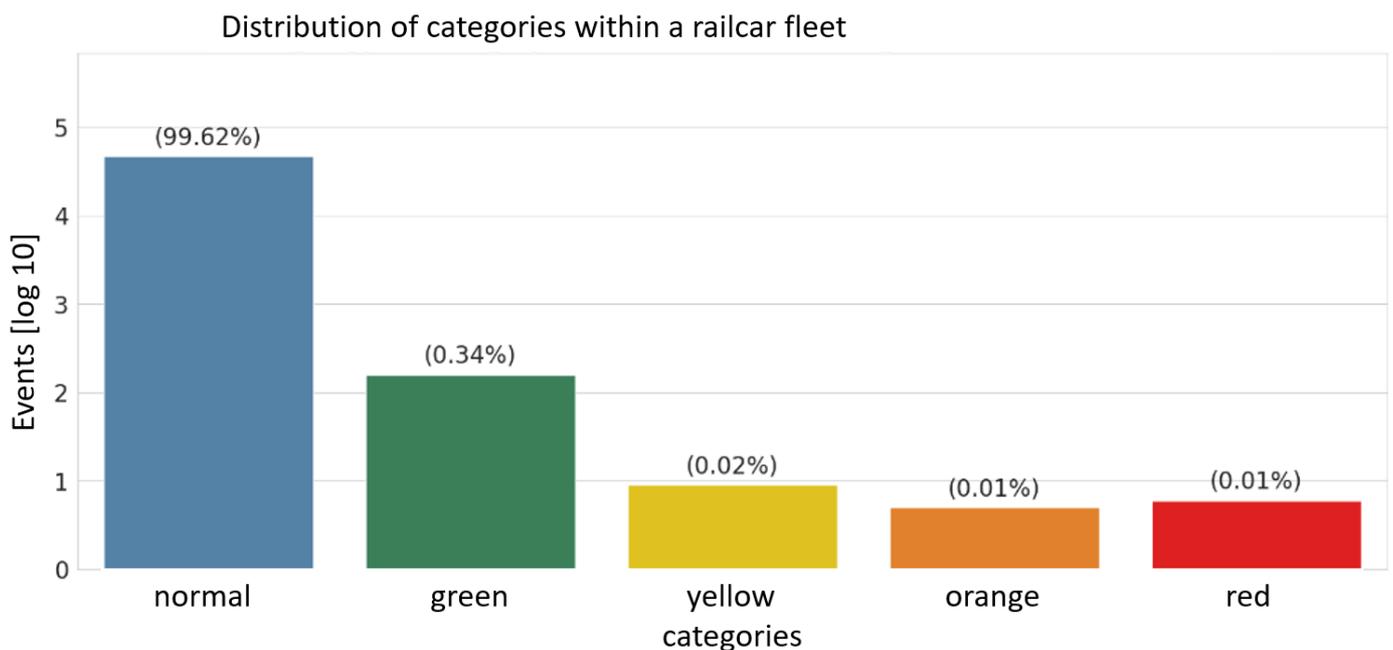
- **Increase the level of traffic- and operational safety**
 - tracking the wheel-, axle- and bogie condition of railway vehicles
 - recognizing trends and rapid (significant) changes in the technical condition and forecasting expected alarms
 - screening of railway vehicles in inappropriate technical condition
- **Increase economic efficiency**
 - increasing vehicle utilization through conditional maintenance
 - reducing vehicle maintenance costs by supporting an optimal maintenance strategy
 - supporting condition-based, predictive maintenance strategies
 - preserving the condition of railway infrastructure, increasing availability and reducing lifetime costs by identifying vehicles in need of repair.

DETECTION & DIAGNOSTICS

The **eRCM** service is suitable for the continuous technical condition monitoring of each wagon and passenger car, using the data of the wayside measuring systems, to identify **trend-like** or **significant changes** in the diagnostic characteristics derived from the measurements. Using **trend-monitoring** of the bogie-suspension or wheel-geometry conditions over time, it is possible to accomplish the maintenance of the rolling stocks on a predictive basis instead of conventional regular inspections. **Predictive maintenance** significantly reduces the idle time of the service, thus reduces operational costs and increases utilization.

Based on the measured values of a specific diagnostic characteristic, the railway vehicle is classified into one of five categories: *normal*, *slightly deteriorating*, *moderately deteriorating*, *highly deteriorating*, *dangerous* technical condition.

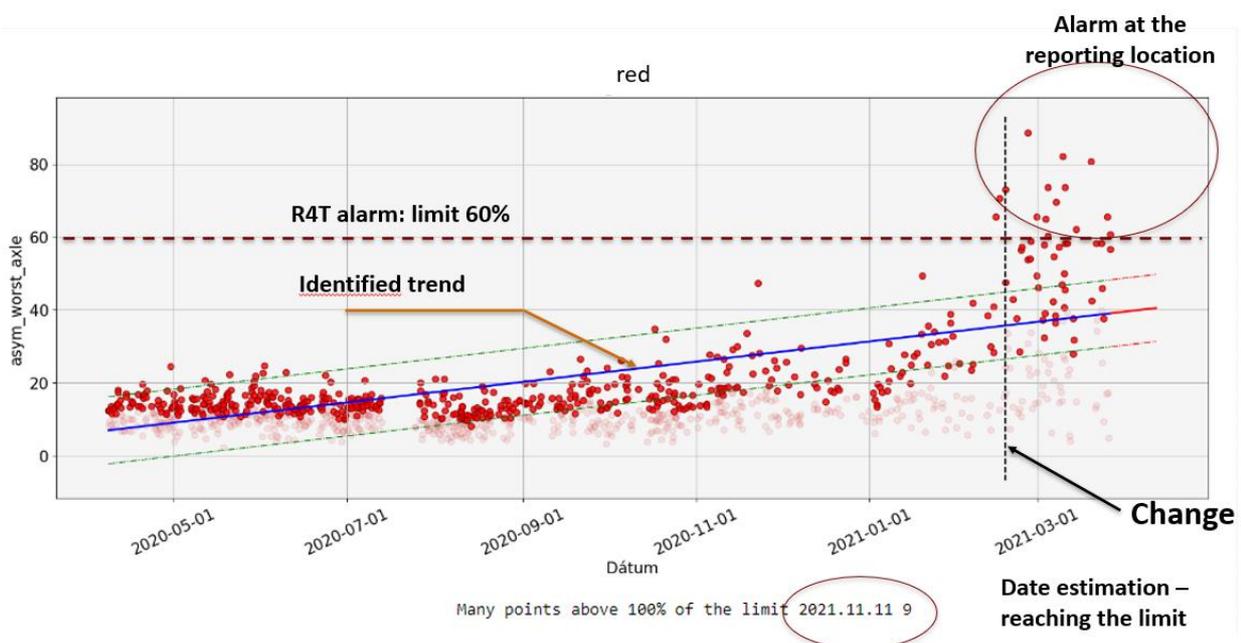
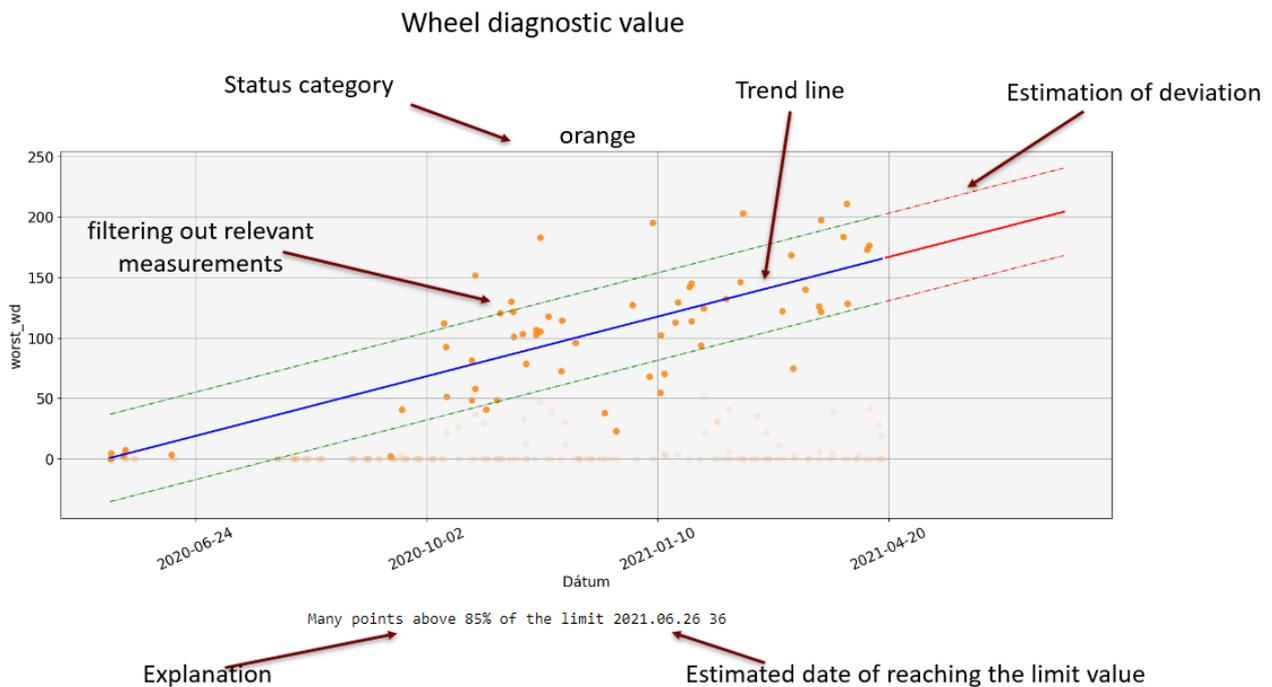
The following figure shows the overall state of a vehicle fleet according to the given categories (using color coding).



DIAGNOSTIC TIME SERIES

In addition to the aggregated results, we also have the option of visual analysis of time series of selected diagnostic characteristics of the vehicles on the watch list, which can usefully supplement the results of the automatic analysis.

On a given time series the result of the trend analysis is represented together with the uncertainty band, the expected time of reaching the limit value, and in the case of a sudden (significant) change, a vertical line is visible corresponding to the estimated time of the change.





it's possible!

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