PROJECT NUMBER

23099

Contact force determination for OLE monitoring

Real-time monitoring of pantographs and overhead line equipment for electrified railways.

By intelligently combining data from a camera and accelerometers, this technology accurately estimates the contact force between a train’s pantograph and the overhead line equipment (OLE). This advanced approach not only improves the precision of height and force measurement but also enhances the system’s responsiveness, ensuring real-time insight for better performance and reliability in electrified railway operations.

Applications: Real-time monitoring of pantographs and overhead line equipment for electrified railways

Features	Benefits
Real-time OLE monitoring using in-service trains provides continues data collection across the network without relying on specialist trains	This improves reliability, reduces delays, and boosts passenger throughout by enabling faster issue detection and resolution

Features	Benefits
Incorporating high frequency accelerometer data	Increases accuracy and the bandwidth of the contact force estimations, allowing the system to provide estimates up to 20 Hz, as required by the EN 50317:2012 standard
Tracking the movement of the pantograph through the accelerometer data	Allows the pantograph height to be measured even when the pantograph cannot be tracked in the images from the camera system
Using a system identification (machine learning approach) to model the dynamics of the pantograph head by simultaneous integration of both the vertical acceleration and the position of the pantograph head	Parameters of the model could be tracked and any changes due to damage or wear could be identified

Available for

- Co-development
- Consulting
- Licensing

To find out more, contact enquiries@innovation.ox.ac.uk and quote the project number.