

# Pitcrew Mining – OTR Asset Monitoring



by INDUSTRIAL MONITORING & CONTROL

## COMPANY

pitcrew.ai seeks to make transport safer and more efficient, through automating vehicle inspection and diagnosis. Our solutions leverage distributed sensors and edge-processed computer vision, backed by machine learning algorithms to provide intelligent realtime 24/7 analysis and monitoring

## PITCREW MINING

The Pitcrew Mining product improves safety and efficiency of large mining fleets through automating the detection of potential vehicle faults, including tyre damage and separations

## OTHER SERVICES

### Pitcrew Compliance

Assists and streamlines heavy vehicle compliance checks through automated inspection technologies

### Pitcrew Fleet

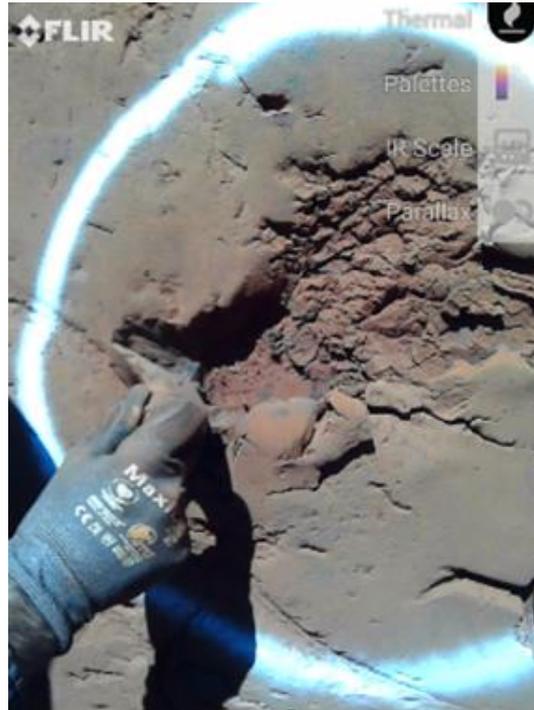
Deep Learning (DL) based predictive diagnosis for fleet operators to maintain heavy vehicles and keep them on the road

## FOR MORE INFORMATION

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Phone: 1300 870 588

Website: <https://pitcrew.ai>



Separation Verification

## Pitcrew Mining System

- The Pitcrew Mining system automatically identifies issues with haul trucks. In addition to tyre separation (see above), other issues include:
  - **Hot tyres:** the system can rapidly identify if the surface temperature of any tyre is warmer than adjacent tyres.
  - **Brake issues:** brake anomalies can be identified, allowing for maintenance to be planned.
  - **Biased Loading:** valuable insights for production to help improve loading correctness.
- A thermal camera along with other sensors is installed at the side of a haul road. Requiring only a 24VDC power supply to operate, the system can be deployed as an intelligent self-contained, solar powered skid with battery. The Pitcrew mining skid includes remote monitoring facilities to avoid unwanted downtime.
- Advanced deep learning models analyse the images and sensor inputs to provide automatic diagnostics of the haul trucks.
- Reports of identified problems are instantly available via email or SMS. For further integration, an API is available for sites to feed notifications into existing workflow systems (e.g. SAP).

## Background

- OTR, or 'Off the Road' dump trucks are critical to the operation of any mine or quarry operation. Responsible for the movement of ore and spoil, they are often an operation's hardest working asset.
- Minor damage to the top layer of a haul truck tyre can start the process of tyre separation.
- Over time the separation can grow larger. Water, dust, and other contaminants working their way in between the tyre layers can accelerate this process.
- The "best" case is premature tyre failure or wear out. In a worst case a tyre fire can occur. Workers have been killed in tyre explosion events on mine sites. Haul trucks have also been destroyed during these events with haul trucks costing in the order of \$4M.
- Haul truck tyres cost in the region of \$50k, extending the life of the tyre, by identifying a separation early enough for repairs to be carried out, provides a major cost saving.



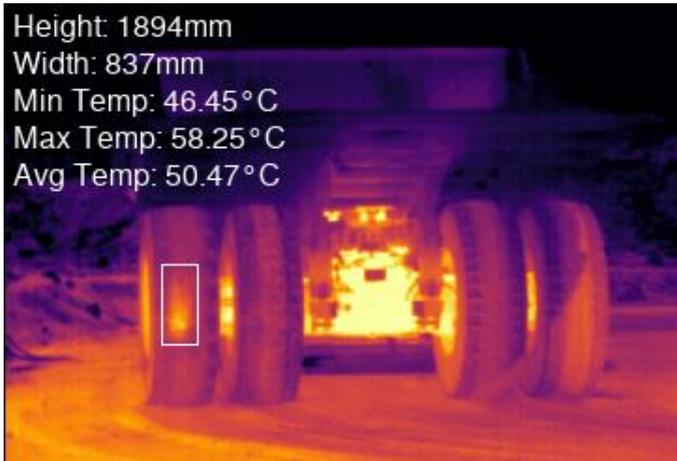
Intelligent Skid



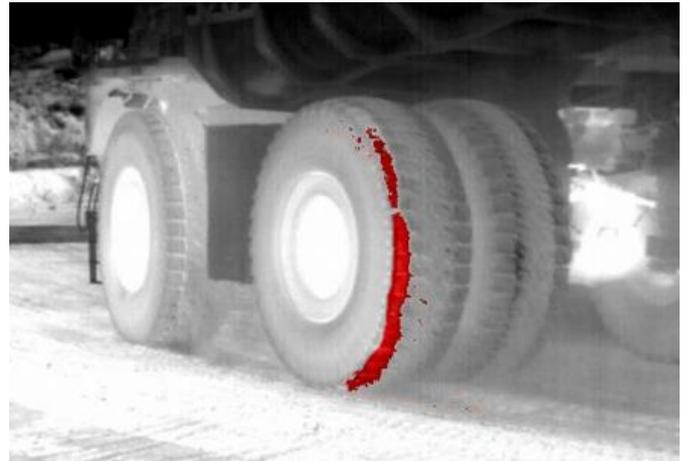
Edge Processor

# System Functionality

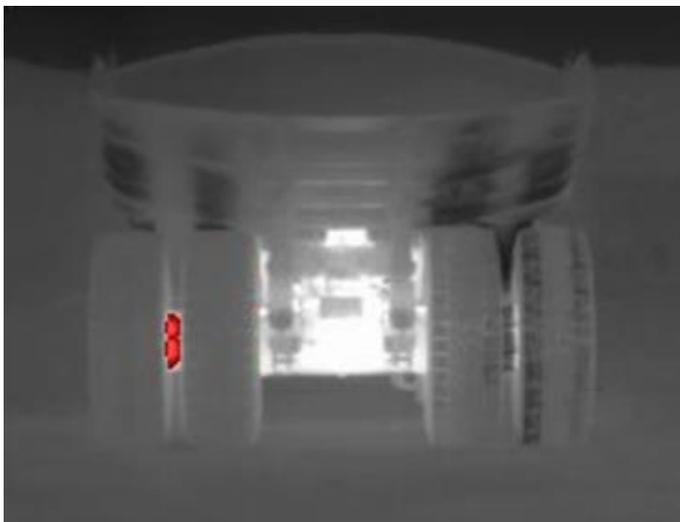
Pitcrew Mining can be configured to detect several potential vehicle issues, especially regarding tyre and brake damage. Some examples of identified vehicle damage are shown in the images below.



Actionable Tyre Separation



Edge Separation



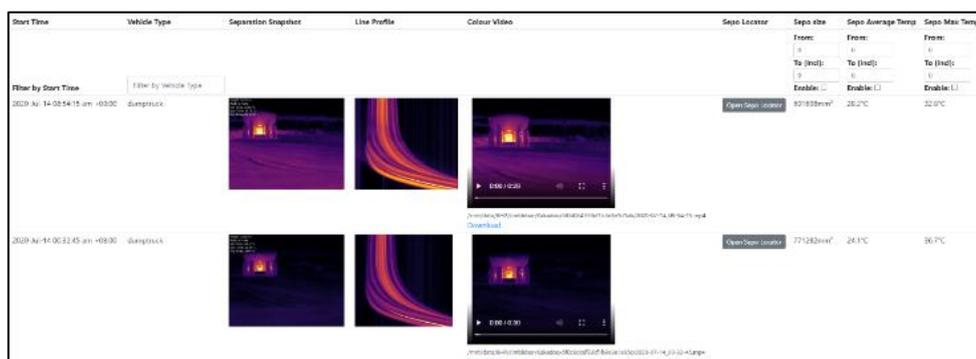
Brake Loading Imbalance



Developing Separation

## Dashboard

The Pitcrew Mining system provides a centralised dashboard for users to view live system status and historical data. Historical data trended over time on a per truck basis assists in developing a deeper understanding of vehicle and tyre defect propagation. Furthermore, data collected by the Pitcrew mining system allows for inter-vehicle trending. This enables a mine operator to identify geographical separation hot spots, which may indicate to the presence of broader operational issues such as poor cleanliness of active mine areas and haul roads.



Dashboard

Pitcrew's **TreadViewIR** is a unique visualisation technique that slices and joins multiple images to provide a complete thermal image of tyre tread surfaces. Simple and intuitive data representations enable your tyre maintenance work force to **safely** verify issues before requesting a vehicle be brought in for tyre replacement.