ToothMetrics

A camera-based missing tooth detection system for mining shovels.

ToothMetrics automatically monitors the condition of the bucket 24/7 for broken teeth & adaptors, and alerts the machine operator immediately in the event of a lost tooth.

Why ToothMetrics?

- Missing teeth that go undetected can wreak havoc with crushers, conveyors, screens and other downstream equipment.
- It can take hours or even days to repair or replace the damaged equipment causing significant loss of production.
- Lethal safety risk: the missing tooth can be fired loose at tremendous speeds.
- Hazards involved with repairing damaged crushers.

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ToothMetrics

Installation on P&H Shovels

Installation on Bucyrus Cable Shovels

Installation on Hydraulic Shovels

Improve Production Efficiency and Safety

ToothMetrics reduces production downtime by immediately detecting broken teeth and adapters on both hydraulic and electric cable shovels. Missing teeth that go undetected often block a crusher or processing plant, costing significant downtime for the mine and causing a serious safety hazard.

Software Features

ToothMetrics software uses sophisticated computer vision techniques to constantly monitor the status of the teeth day and night. A live image of the shovel bucket is displaying to the machine operator, as well as a status indicator for each tooth. The operator has an option to review stored images of the bucket in previous diggings to verify detection results. The user interface is intuitive and language independent, and several display modes allow the operator to choose the interface they are most comfortable with.

Rugged and Compact Design

The product has been designed with special attention to its reliability in the harsh working environment of surface mines. The camera is shock/vibration resistant, the cables are armoured and terminated with MIL spec connectors, the embedded computer has no moving parts, and the colour, touch-screen LCD display is compact, industrial grade and high brightness. The camera is also equipped with a heater which is automatically turned on in cold temperatures. A compact, long-life, wide flood Xenon (HID) type light source is installed on a shock-mount beside the bucket camera to illuminate the scene for night time operation.

Network Connectivity

ToothMetrics is equipped with an Ethernet port to connect to an existing wireless (mesh) network for transmitting the tooth status directly to the mine control room for a faster response time to an alarm.

Installations

ToothMetrics has been developed over the course of eight years. To date, ToothMetrics has been installed on many hydraulic and electric cable shovels, copper, gold, iron, silver, diamond and nickel mines around the world.

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