EgaRoh.ScaleAssist

Development of an Assistance System for Carrying Out the Scaling Process

In underground mining, the scaling process takes place after blasting. The idea is to remove loose rock hanging from the roof in a controlled manner aimed at creating a safe working environment. The scaling process can be performed either manually (using a scaling bar) or mechanically (using a scaler). For an effective scaling process, loose rock has to be detected. Till date, this process has not been successfully automated.

The EgaRoh.ScaleAssist project aims to develop an assistance system for mechanical scaling. This includes long-term testing in different mines. The project intends to culminate in a prototype implementation of the assistance system in a relevant environment and a complete demonstration of its technical feasibility. An algorithm for sensor-based loose rock detection will be developed and validated.

During this project Hermann Paus Maschienenfabrik GmbH is responsible for integrating the sensor technology into a scaler and for developing an assistance system. The AMT will analyze the data recorded during long term tests to identify and analyze and find parameters influencing loose rock detection, develop and improve software for reliable loose rock detection based on the collected data, implement an algorithm for combining infrared thermography (LWIR) data and acoustic emission (AE) data to increase the accuracy of solvent detection and to validate the developed algorithm with regard to its effectiveness and reliability.

For sensor-based loose rock detection, a combination of LWIR and the AE technology will be used. That combination was already tested in the ScaleSense project. Similar to an experienced machine operator feeling and listening, loose rock can be detected using the AE technology based on the vibrations of the scaling machine. Combining two different technologies offers advantages such as improving the robustness of the sensor system in case of malfunctions, higher reliability, and more complete detection of loose rocks.

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