EgaRoh.CASmin

Evaluation and Extension of Safety Sensor Systems for Mining Environments

To ensure safe operation, the integration of ASAM into mining processes requires safety strategies and systems as well as safety certification, which has only been implemented to a limited extent to date. The EgaRoh.CASmin research project therefore aims to increase the safety of safety sensor systems for mining and other outdoor applications. The central research focus of EgaRoh.CASmin is object detection systems (ODS), which combine sensors with signal processing

Currently, there are no specifications regarding the required performance of an ODS under environmental conditions. However, without such detailed specifications regarding the conditions under which an ODS is safe, it is not possible for ASAM to achieve ODS-based safety certification. The use of ASAM is therefore only possible in conjunction with a number of additional technical and organisational measures, such as the establishment of autonomous exclusive zones (AOZ).

Before the required safety of ODS can be specified, a methodology is first needed to quantify and assess the safety of detection capabilities. Such a methodology is a prerequisite for closing this regulatory gap and ensuring the safe use of ASAM outside exclusive zones. A core objective of the EgaRoh.CASmin research project is therefore to develop and validate an objective comparison methodology for ODS in mining that takes into account environmental influences such as weather and process conditions.

To this end, EgaRoh.CASmin is developing and setting up a continuous test bench in a real mining environment to test the long-term use of various ODS in mining environments. Various sensor types such as lidar, radar and cameras are being tested. This enables comprehensive sensor evaluation under different weather, operating and other environmental conditions. The aim is to identify limitations and gaps in sensor technology (Operational Design Domain, ODD) and to develop new technical implementations.

With regard to the scalability and transferability of the methodology beyond the test bench, simulative methods for ODS evaluation are being investigated. The aim here is to accurately map environmental influences on sensor technology for environmental detection. The simulative results can be checked for accuracy on the developed test bench.

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