

Reduction of personnel in exposed areas, safety devices and early steps towards robots in mining

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ABSTRACT

In underground mining the harsh environment and the possible dangers from rock fall or bursts always leave a certain residue risk to personnel on site. Therefore there is an ongoing trend towards full mechanisation and then automation of the mining process.

But some tasks are difficult to automate and the need for maintenance of the equipment underground still needs some personnel in potential exposed areas.

To protect this underground work force improved ground support and proximity detection systems, which monitors persons around dangerous equipment and No-Go-Zones have been developed and employed. The paper will discuss the need to build such systems with Functional Safety, which also will be a key for autonomous vehicles and personnel using the same underground space in future.

To address the rock engineering challenges Montanuniversitaet Leoben has initiated the EIT RawMaterials education program „Safe Deep Mining“. Also associated research into better understanding of mining action and rock reaction has been initiated.

The paper will present some conceptual work towards the mechanisation and automation of the loading process with bulk explosives using a robot arm.

Montanuniversitaet Leoben is partner in the European Horizon 2020 Research Project ROBOMINER, with special focus on the possible excavation concepts.

Global Military is developing autonomous robots for their purposes – results so far are impressive and based on these developments of robots for maintenance and dangerous work in underground mining will be possible in the coming years. The appearance of autonomous moving working robots in mining also will have an impact how we build equipment and operate in future. The paper will address some ideas in that regards.