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Abstract

Concept of the production tool system for a small-scale mining robot

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Abstract:

Today we see early research and development in robots, which are expected to replace the human workforce in underground mining within the next 30 years. The progress during the upcoming 30 years can be divided in 3 parts, which will all develop consequently. The ongoing researches in some EU - funded projects focus on the development of new mining and perception systems and also on sustainable mining ecosystems. The goal of the next 10 years is to create first industrial pilots, which can operate semi-autonomously in "small deposit scenarios". The vision for 2050 is to have completely autonomous systems, which are able to work in ultra-depth scenarios. This paper will be discussing the H2020 project ROBOMINERS with a special focus on the production tools and the possible excavation systems for a small-scale mining robot. ROBOMINERS will develop a bio-inspired and modular robot-miner for small and difficult to access deposits. Potential application areas could be: small deposits, abandoned mines and ultra-depth. The limitations of power and weight increase the complexity of the design of the production tools immensely. Each excavation method's efficiency is depending on the material to be excavated, the available power and the machine's capability of handling the reaction forces. To design a completely environmentally friendly robot-miner, the entire system will be running with water-hydraulics. Eventually, a concept of the production tool system for the robotic miner will be presented.

Biography:

Michael Berner has completed his master's degree at the age of 24 years from Montanuniversity Leoben and started his PhD in July 2019 at the department of mineral resources engineering. He is responsible for the H2020 project ROBOMINERS, which has a running time of 4 years.

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