Current Research Projects

Here you will find an overview of our current publicly funded research projects, grouped according to the Smart Services corresponding to the data information value chain, which you can find in the overview of our research focus areas. In addition, the AMT implements projects on a private contract basis together with industrial companies, which, however, cannot be listed here for reasons of confidentiality of the research subject.

MINE DESIGN AND ENERGY MANAGEMENT

ELMAR

The objective of the ELMAR (Integration and Demonstration of the Use of Electric Heavy-Duty Transport Machines in the Raw Materials production) project is to investigate the fundamental effects of the use of electric automated transport vehicles in the raw materials production on the entire operation.

Furthermore, technologies and solutions for the utilization of electric mobile machines will be developed and their integration into existing and planned operational environments will be developed and tested in real-world mining environments.

The overall objective of the contribution AMT is making to the project is to investigate the electrification of raw materials extraction in order to generate a detailed understanding of the upcoming transformation of mine operations. For this purpose, a mine plan for optimized energy deployment, a holistic concept of energy design for raw material operations, and an IIoT gateway for decentralized machine communication will be developed within this project.

To achieve these respective goals, model-based applications for mapping raw materials extractions will be (further) developed and transferred into methods and procedures that enable optimized long-term and short-term planning and control of operational processes with respect to energy and resource use.

[Learn More!](#)

AUTOMATION

NEXGEN SIMS

The objective of the NEXGEN SIMS (Next Generation Carbon Neutral Pilots For Smart Intelligent Mining Systems) project is the further development and advanced demonstration of technologies for future-oriented sustainable mining in Europe. The consortium, which is funded by the EU within the framework of Horizon 2020, involves well-known partners from research and industry from all over Europe. The project is the successor of the EU-funded project SIMS (Sustainable Intelligent Mining Systems), in which the AMT was also involved.

[Learn More!](#)

MINE SAFETY

HEET II

The HEET II project aims to develop the innovative high efficiency power system for machines and devices, increasing the level of work safety in underground mining, in potentially explosive conditions such as coal mines. The system will consist of four critical subsystems:

- transmission of electricity with single-wire technology,
- transmission of electricity with wireless technology,
- integration of the rail of the suspension monorail and
- monitoring and control system of the power supply network.

The AMT will implement a platform to monitor the parameters of the system and the environment and send them to the surface of the mine. These subsystems will be developed and implemented by a collaboration with an interdisciplinary consortium from Germany, Poland and Romania.

[Read More!](#)

SCALE SENSE

The ScaleSense project aims to develop a sensor-based system for the detection of loose rock within the scaling process and to integrate the system into a scaler. This innovative system will be used in underground mines within the scaling process. It is intended to meet the increasing demands on the raw materials industry. This will assist the operator in identifying loose rock and making the scaling process safer and more efficient.

[Learn More!](#)

INNOVATIVE TEACHING

Enhancing Digital STEM

As a response to the COVID pandemic, universities around the world have rapidly adopted online and blended models of teaching and learning within STEM. This has seen considerable investment in supporting systems but has highlighted a lack of an accessible evidence base to inform educators' decisions within these systems. Currently, educators practicing within digital STEM environments face an unreasonably high barrier of entry to the evidence base as it is fragmented across dozens of potentially relevant sources containing 100,000+ potentially relevant papers.

This project will create a Digital Short Course that will develop participants' ability to identify, implement and evaluate evidence-based practice within digital STEM environments.

[Learn More!](#)