SAFEmine is a small company located in Baar developing and distributing equipment for mining collision avoidance. In mining operations, very large and heavy dump trucks with poor visibility have to drive close to workers during maintenance and shift changes. Accidents with vehicles of that scale are inherently catastrophic.

In order to track and locate vehicles and mining workers outdoors, indoors and underground, a new localization system is developed. This requires reliable, fast and accurate tracking of tags relative to anchors placed on mining vehicles and in fixed locations using ultra-wideband RF ranging. The system has to scale to hundreds of anchors and tags with multiple locations per second and sub-meter accuracy. Furthermore, due to the rough environment it has to be robust and allow for multiple points of failure in difficult propagation environments and changing setups.

Goal

In this project, you are tasked to design, implement and evaluate a self-organizing anchor network topology based on existing hardware. As a part of the design, an error model is implemented to optimize the topology. Apart from regular supervision by an ETH assistant, you will also be in continuous contact with developers from SAFEmine and can contribute to a future product.

Pros

- Good programming skills (embedded systems)
- Creative thinking and ability to work independently
- Good problem solving skills
- No fear of modelling and implementing complex theoretical concepts

Contact

- Thomas Kaufmann: thomas.kaufmann@safe-mine.com, SAFEmine AG
- Michael König: mikoenig@tik.ee.ethz.ch, ETZ G97