

## Trials at the Urgeiriça flooded underground mine are a success

The UNEXMIN project is developing a technology capable of autonomous exploration and mapping of flooded mines. The robotic platform uses non-contact methods to gather geological, mineralogical and spatial data without major costs or risks associated. The field trials help the team to access the platform development and make improvements to the unique technology.

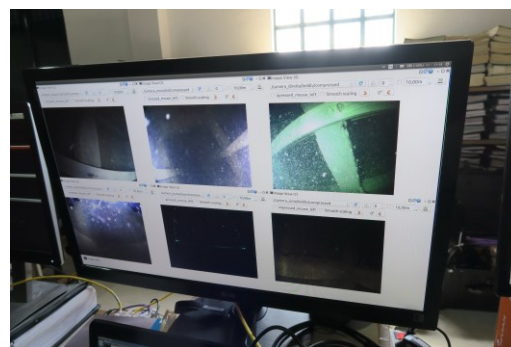
UNEXMIN has finished its third trial, at the Urgeiriça mine, Portugal, where it tested two robots to explore and map the galleries and tunnels of the flooded underground mine. Robots UX-1a and UX-1b were tested at different times with positive results.

The Urgeiriça trials were divided in two parts. The first run from 6<sup>th</sup> to 15<sup>th</sup> March. Here, the UX-1a robot was tested extensively at the same time as some of UX-1b's instrumentation. The second part of the trials was held from the 1<sup>st</sup> to 7<sup>th</sup> April. The period inbetween was used to calibrate and improve the robots' functionalities and equipment at INESC TEC's laboratory.

The first part included testing with the robot with dives up to 104 m water depth. The entrances of the first four levels within the Urgeiriça mine were mapped (1<sup>st</sup> level at 30 m, 2<sup>nd</sup> at 60 m, 3<sup>rd</sup> at 85 m and the 4<sup>th</sup> at 110 m, below surface level). The entrance chamber of the 1<sup>st</sup> level is partially collapsed, so only a few metres were investigated. The 2<sup>nd</sup> level is collapsed after few metres so it could not be searched. The 3<sup>rd</sup> level is in good condition; this level was used in multiple test dives to trial different instruments. On the entrance of the 4<sup>th</sup> level, a granite wall with black veins was recorded by the multispectral camera.

During the second part, dives with the robots focused on their movement, navigation and mapping capabilities. These included tests involving pitch and roll movements, use of Structured Light Systems with UV-light – from where the team could identify some present mineralogy -, multibeam and other scientific instrumentation of relevance.

The UNEXMIN team is now channeling all its efforts to the preparation of the Ecton mine trial, in May 2019, the one that will ultimately prove the operability of the UNEXMIN technology in flooded mines. The outcomes of the research efforts will be presented during the project's final conference in Brussels, on 26<sup>th</sup> September 2019.



**FOLLOW US / FOLLOW THE PROJECT**

<http://www.unexmin.eu/>



**CONTACT**

Coordinator: University of Miskolc (UNIM)  
Norbert Zajzon: [nzajzon@uni-miskolc.hu](mailto:nzajzon@uni-miskolc.hu)

