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Robots
Terrawatch

Robots to explore the dark flooded depths of old mines

Earth's metals and minerals, essential to our technology, are running out. We need to explore long-forgotten passages in flooded mines

https://www.theguardian.com/technology/2017/aug/06/robots-to-explore-the-dark-flooded-depths-of-old-mines#img-

Software testing in a UX-1 mockup by the UPM team. Photograph: Claudio Rossi/UNEXMiN Projec

Indium, rhodium, platinum, tellurium and gold: these are some of the rarest elements in the world. From smartphones (which contain a whopping 60 to 64 elements) to hybrid cars, wind turbines and medical equipment, much of the technology we depend upon contains a rich list of elemental ingredients.

Meanwhile, demand for traditional metals such as copper and aluminium is rocketing, driven by the rapid growth of emerging economies in Asia and South America.

If our voracious appetite for these minerals continues at the current rate then rare earth metals may be mined out in 15 to 20 years, and indium may only have another decade of supplies remaining. Even aluminium could run dry within the next century.

So what can we do? One way of eking out these resources for a bit longer is to return to old mines and extract the leftovers. With this in mind Norbert Zajzon, from the University of Miskolc in Hungary, and his colleagues are designing a robot capable of exploring flooded mines. The robot will be able to travel up to half a kilometre underground, mapping out long-forgotten passages. By 2018 they hope to have a prototype robot explorer, and its first test will be to enter the flooded Kaatiala Mine in Finland.

Flooded shaft in Deep Ecton, Staffordshire. Photograph: Alfredo Martins/UNEXMiN Project

The ultimate challenge for the UNEXMiN project is going to be the Ecton Mine in Staffordshire the UK, a copper mine whose flooded lower levels haven't been seen for over 150 years. Across Europe there are over 30,000 flooded mines, containing minerals that perhaps weren't profitable to extract at the time, but today could be worth more than gold.