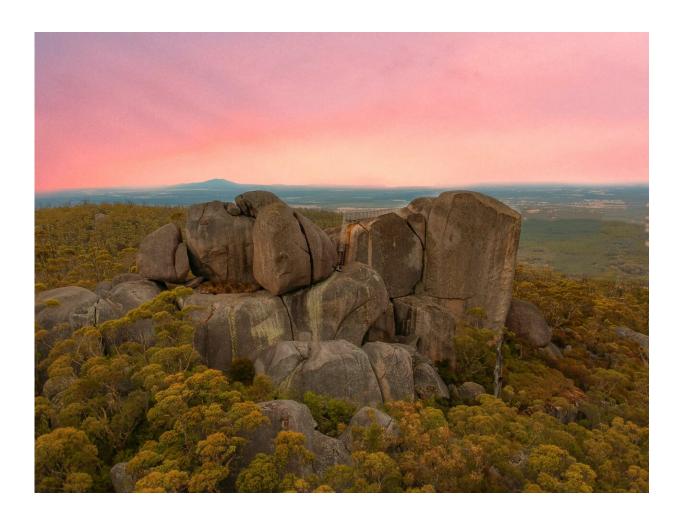# Researchers help expand mineral exploration using machine learning

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Credit: Unsplash/CC0 Public Domain

Curtin University researchers have developed a new system that will help

identify undiscovered mineral deposits in Western Australia using an advanced machine learning tool.

As part of a research project in collaboration with the Geological Survey of Western Australia, geochemical data collected all over the State will be analyzed to reveal patterns in big data that are not possible to see with standard methods.

Lead researcher Dr. Vladimir Puzyrev, from Curtin University's Oil and Gas Innovation Centre and the School of Earth and Planetary Sciences, said researchers were using a machine learning technique called deep learning to help expand mineral exploration in Western Australia.

"Deep learning methods are completely transforming the landscape of data analysis because they achieve unprecedented performance levels across various tasks, significantly reducing the manual labor and subjectivity present in more conventional methods of exploration," Dr. Puzyrev said.

"The ultimate aim of this research project is to help identify new mineral deposits in Western Australia by analyzing big geochemical data using deep learning methods."

Researchers are analyzing the Geological Survey of Western Australia's Mineral Exploration database, WAMEX, which captures the State's exploration project activities over many years.

Geological Survey of Western Australia Project Lead and Senior Geologist Dr. Paul Duuring said the WAMEX database contained more than 50 million samples.

"There are time and cost challenges in the manual quality control of such large data, so this project is an important step towards adding value to

existing digital geochemical datasets," Dr. Duuring said.

"An improved database opens new possibilities for Western Australia's mineral exploration sector."

Dr. Puzyrev said the project also offered additional potential applications including identifying the most cost-effective and innovative geochemical data analysis method for the treatment of samples.

"More generally, this research project also opens up potential new avenues for future research that will also benefit the State's mineral exploration sector," Dr. Puzyrev said.

Provided by Curtin University