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Mapping the Mine Face with Artificial Intelligence

Innovative MRIWA research shows how AI can use scanned data to differentiate ore from waste rock, allowing each stage of the mining process to be planned more effectively in advance.

The character and intensity of mineralisation can vary significantly within an ore body, requiring constant measurement and vigilance to keep excavation and processing of the valuable minerals operating efficiently. New research supported by the Minerals Research Institute of Western Australia (MRIWA) helps deliver a new and more efficient method for maintaining this important oversight during the mining process.

Developed by Plotlogic and the University of Queensland (UQ), this system uses visible and infrared light to automatically classify material as ore or waste rock during mining.

Professor Ross McAree, Head of the School of Mechanical and Mining Engineering at UQ said “Each mineral has its own characteristic response to different wavelengths of light, so by scanning the mine face with our system we can map out the ore grades virtually instantaneously.”

This real-time mapping allows the mining process to be planned out before digging even starts. Beyond this immediate efficiency gain, the enhanced ability to recognise ore grade could also underpin future autonomous mine systems.

“Machines equipped with this imaging system would be able to recognise ore grade as they were excavating it” explained Professor McAree.

“Linked to artificial intelligence, this could allow automated machinery to operate in the mine environment, allowing workers to be removed from hazardous parts of the mining process.”

In releasing the report, MRIWA CEO Nicole Roocke said “Investment into research of this kind helps position our minerals industry at the leading edge of technology.”

“This imaging approach could prove particularly valuable in Western Australia’s mining sector where rapid extraction and consistency of ore grade provide a competitive advantage.”

“By supporting this fundamental research, the Western Australian Government is helping to maintain the value delivered to the state from our natural mineral wealth and our strength in mining sector innovation.”

The technical report summarising the findings of this research can be found here <https://www.mriwa.wa.gov.au/research-projects/project-portfolio/real-time-mining-face-grade-determination-using-hyperspectral-imaging-techniques>

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