

GEOVISION

CRCP

Intelligent vision, sensing
and data fusion for
mining and exploration



Geovision CRCP is a Cooperative Research Centre Project (CRC-P) which will deliver **intelligent vision, sensing and data fusion for mining and exploration.**

Geovision CRCP will develop and commercialise an integrated solution to improve, support and automate decision making at exploration and mining drill sites.

We will combine multi-sensory core scanners, data fusion and machine learning capabilities to capture geological and structural data not currently collected or analysed.



UNDERSTANDING FROM DATA



Exploration and mining companies currently do not maximise the amount and types of information from each drilled hole and extracted core.

Core is usually taken to a laboratory for analysis but potentially valuable information may be lost due to the effort and time required. There are also limits to what humans can visualise and interpret, with the results—in multiple formats and both qualitative or quantitative—only available weeks, or even months later.

Industry is thus faced with the problem of reaching swift strategic decisions based on incomplete or poorly correlated information.

Industry has identified a need for more machine sensing, interpretation and data integration in the drilling process

for mineral exploration and geological work flows. The 'digital mine' of the future requires these technologies.

Geovision CRCP will be developed in and exported from Australia as a value-add service in the METS industry offering invaluable decision-making in exploration and mining by rapidly acquiring novel information from core and providing outputs in real-time.

Project leader **Boart Longyear**, was established in 1890 and is the world's leading provider of drilling services, drilling equipment and performance tooling for mining and drilling companies.

Boart Longyear services a diverse mining customer base spanning a wide range of commodities, including copper, gold, nickel, zinc, uranium, and other metals and minerals. Under

Geovision CRCP's real time analysis of the core (MAIN IMAGE) will eliminate the mechanical process where geological and structural data is often misinterpreted or not collected (ABOVE).

FAR RIGHT: The Geovision CRCP team onsite at the 'living lab' research environment in the Adelaide Hills.



L-R: **Professor Chunhua Shen** School of Computer Science, University of Adelaide; **Dr Damith Ranasinghe** School of Computer Science, University Adelaide; **Professor Nigel Cook** School of Chemical Engineering, University of Adelaide; **Associate Professor Yung Ngothai** School of Chemical Engineering, University of Adelaide.



KNOWLEDGE FROM DATA

and will lead to economically defining many more mineral resources.

SRA Information Technology is an Australian owned specialist software company based in Adelaide with offices nationally and internationally. SRA, working closely with CRCP partners, will scan, review, select and develop the suite of componentry which will make up the final go-to-market offering.

An early selection has been made to partner with **Amazon Web Services (AWS)** for the technology platform and machine learning services.

This technology is based on the same proven, highly scalable Machine Learning technology used for years by Amazon's internal data scientist community. The service uses powerful algorithms to create Machine Learning models by finding patterns in existing data. These models are then used to process new data and generate predictions for Geovision CRCP.

The outcome will automatically collect and distribute reliable, objective and high resolution geological, structural and geotechnical data at the drill rig

and/or globally as required, enabling fusion with interoperable data available to the mining industry.

New scanners and sensors will be placed into the workflow on exploration drills with autonomous data collection and distribution, without the need for full-time onsite geologists or technicians. The data will assist with both day to day and long term mine planning, enabling a paradigm shift for value adding data integration.

"AWS is excited and humbled to be part of the Geovision CRCP project. We are committed to providing the mining industry with world leading machine learning and AI technologies on the AWS Cloud and we believe this project will have a significant impact in helping the mining industry maximize the benefits of using data for improved decision making."

Paul Migliorini
Amazon Web Services Managing Director,
Australia and New Zealand

their Geological Data Services (GDS) initiative, Boart Longyear are focused on developing digital technologies that will provide efficient and accurate resource defining information to the end user at lower cost which will lead to defining more mineral resources and more mines in the future.

Their living lab research environment in the Adelaide Hills is an ideal environment for unique projects like the Geovision CRCP to take place. It offers a setting for researchers to integrate with geotechnologies to develop applied technologies that will work in a live drilling environment.

The technology that will be delivered from the Geovision CRCP will apply digital technology, algorithms, and software to traditional mineral exploration practices



WEALTH FROM DATA

The University of Adelaide is one of Australia's most research-intensive institutions and a place where world-leading researchers come together in first class facilities to address some of the world's grand challenges. The University of Adelaide offers world-leading researchers, modern facilities and an innovative, interdisciplinary culture, combined with a commitment to delivering research that is highly valued by our local and global communities.

The interdisciplinary research team from The University of Adelaide involved with Geovision CRCP contributes key complementary expertise in core earth science, computer science and geochemical engineering fields. Researchers from the School of Computer Science, ranked among the world's leading research groups in computer vision and with a growing reputation in statistical machine learning, contribute nation-leading expertise in image understanding, deep learning and applications in natural language processing.

Earth scientists bring skills in geology, mineralogy, geochemistry, structural geology and an understanding of how mineral deposits and associated hydrothermal alteration are formed.

Through existing partnerships with South Australia's minerals industry, they offer knowledge of the unique and challenging geological environments in the state and nationally, and assisted by the university's state-of-the-art microanalytical facilities, offer insights into how simple observations or measurements on drill core can be translated, over time, into new mineral discoveries.



L-R: **Tim Chopping** Executive Manager - Sales and Marketing and **Michelle Bieniasz** National Manager from SRA and **Peter Kanck** Senior Manager Technology Development and Integration, Boart Longyear.

