Intelligent Underground Mapping with AiMaps
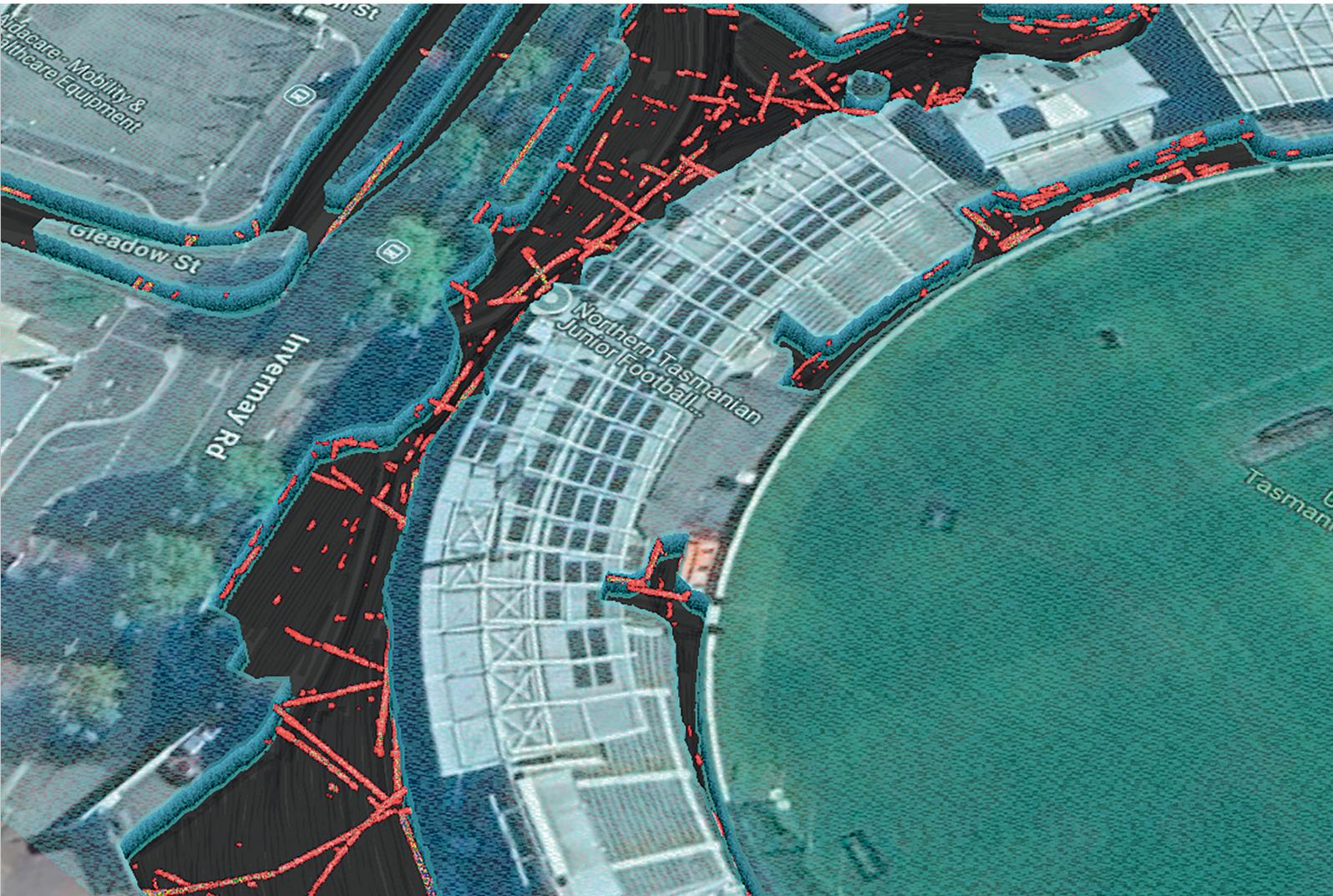
Subsurface insights into the redevelopment of the UTAS Stadium

AiMaps provides an intelligent view of underground utilities driving down time and workload in radar data processing and interpretation.

IDS GeoRadar: The leader in multi-frequency and multi-channel Ground Penetrating Radar

www.idsgeoradar.com

Intelligent Underground Mapping with AiMaps

Understanding what lies beneath the surface is critical to avoiding risks, delays, and costly mistakes in construction and infrastructure projects. A clear and accurate view of underground utilities empowers teams to make smarter decisions, reduce uncertainty, and improve safety. Yet in many cases, the complexity of the terrain, such as densely built environments or geologically challenging areas, can obscure vital infrastructure, making it difficult or even impossible to detect using traditional tomography methods.

IDS GeoRadar has developed AiMaps, a pioneering AI-based software solution that brings a new level of intelligence for utility mapping. AiMaps uses artificial intelligence to support surveyors in interpreting radar data more efficiently and accurately.

Redevelopment of the Utas Stadium by UDM

UDM - Utility Detection & Mapping is a Tasmanian-based specialist surveying and subsurface mapping company, combining advanced technology, field expertise, and precision mapping, to deliver reliable underground and above-ground insights. UDM was tasked with capturing high-resolution subsurface data to provide a complete picture of what lay beneath the stadium.

Stream UP mounted on UDM vehicle in front of UTAS Stadium

Their goal was to reduce risk, improve safety, and enable smarter decision-making throughout the redevelopment process. To achieve this, UDM deployed a combination of IDS GeoRadar solutions, multi-array GPR systems, Stream DP and Stream UP, alongside AI-driven software, AiMaps and IQMaps.


Aerial view of UTAS Stadium

Located in the historic precinct of Invermay, the UTAS Stadium has been a venue for major sporting events since 1921. As part of its redevelopment, the site required a comprehensive and accurate mapping of underground services prior to demolition and reconstruction.

The challenge was significant: the stadium sits atop an old swamp area, where deeply buried and congested infrastructure posed serious risks to excavation and planning.

On-site surveying: capturing the underground

The survey was carried out over 3 days by a team of 4 specialists, successfully covering an area of ??? sqm. Given the stadium's location in a former swamp area, the need for deep and reliable detection was critical.

Stream DP, powered by patented EsT technology, proved particularly effective in reaching 2-3 meters below ground level. Stream DP's rugged and modular configuration also allowed the team to adapt quickly to uneven surfaces and undercroft areas.

Stream UP complemented enabling fast coverage of larger areas. Its lightweight design and ability to operate without ground contact helped reduce physical strain and allowed for efficient data collection across the site. Together, the two systems provided a complete and high-quality dataset.
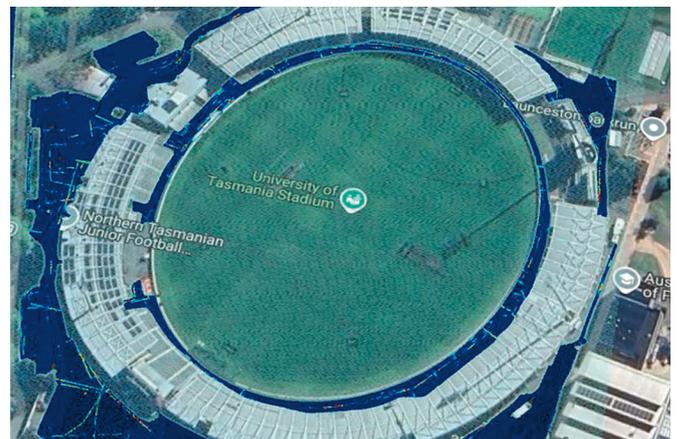
Surveyed area around UTAS Stadium, AiMaps visualisation

## Post/processing phase: from raw data to actionable insights

Once the fieldwork was complete, the radar data was initially reviewed in **IQMaps**, which provided a structured environment for organizing and visualizing the large volume of information. The software's ability to display data in 3D and manage time-slices helped the team begin identifying key subsurface features.

The full dataset was then uploaded to **AiMaps**, that uses deep learning algorithms to automatically refine radar signals, helping surveyors interpret complex data more efficiently. In just 8 to 12 hours, **AiMaps was able to detect pipe configurations** that had not been visible during manual review, particularly in congested zones and areas with overlapping infrastructure.

The post-processing phase, managed by two team members only, benefited from AiMaps' ability to simplify interpretation and highlight previously unknown utilities.
By leveraging Artificial Intelligence, AiMaps provides clean uncluttered data for a clear view of what lies beneath. **Survey results are delivered in less time and with greater confidence for an accurate underground utility mapping.**
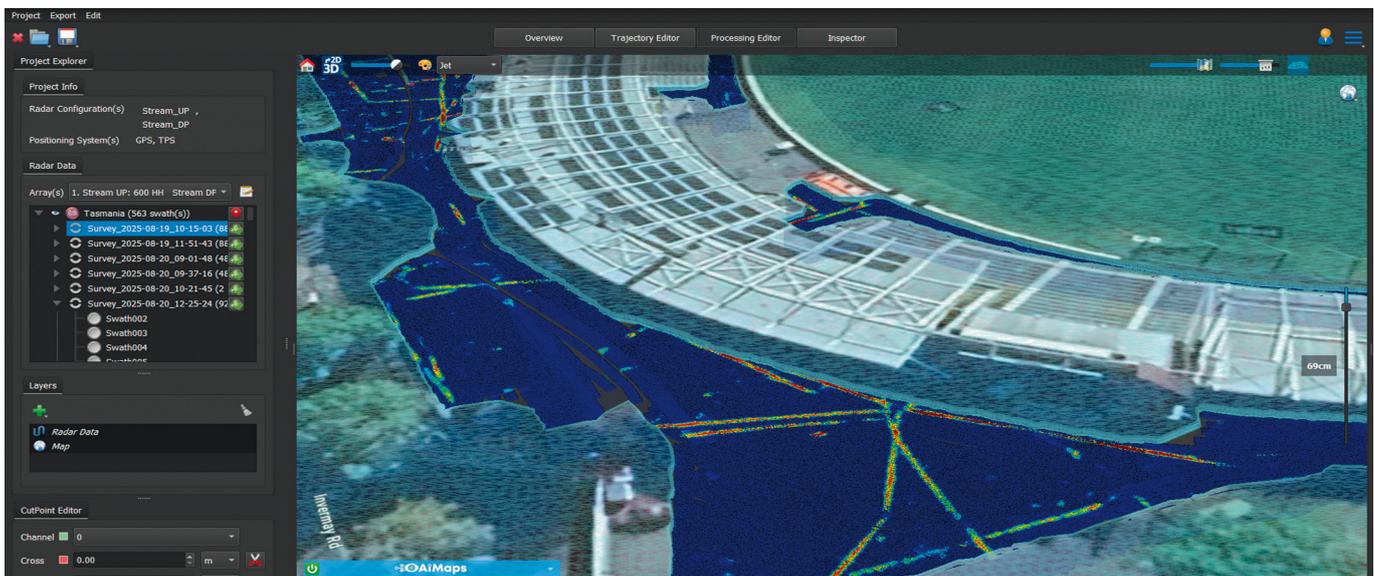
Detail of the surveyed area around UTAS Stadium, AiMaps visualisation

Conclusions: AiMaps as a game-changer in surveying

With the use of AiMaps, UDM was able to complete the post-processing phase five times faster compared to its standard workflow, allowing the team to deliver results quickly and with a greater confidence in a technically demanding environment.

The successful survey of the UTAS Stadium survey confirmed the value offered by the integration of AiMaps into UDM's detection and mapping workflows, confirming the initial expectations for a tool capable of enhacing productivity.

AiMaps' contribution was not limited to speed only, as it also ensured the accurate location of all relevant targets, revealing previously unknown underground features and providing valuable context for further investigation and planning.

Speed, accuracy and clarity are the key elements that drove UDM's decision to the adoption of AiMaps furtherly improving their surveying performance.

> " *AiMaps has a massive impact on our workflow. It boosts efficiency, making our operations up to 5x faster and helping map previously unknown pipe configurations.* "

Rod Brumby
Managing Director
UDM - Utility Detection Mapping

IDS GeoRadar IDS GeoRadar, part of Hexagon, provides products and solutions, based on radar technology, for mining, civil engineering and monitoring applications. The company is a leading provider of Ground Penetrating Radar (GPR) and Interferometric Radar solutions worldwide.

IDS GeoRadar is committed to delivering best-in-class performance solutions and to the pursuit of product excellence, through the creation of application-specific, innovative and cost-efficient systems for a wide range of applications including mining, utility detection and mapping, civil engineering, geology, archaeology and public safety.

Hexagon (Nasdaq Stockholm: HEXA B) has approximately 24,800 employees in 50 countries and net sales of approximately 5.4bn EUR.

Learn more at hexagon.com

IDS GeoRadar Srl | **www.idsgeoradar.com**

Via Augusto Righi, 6, 6A, 8 -56121 Pisa, Italy
Tel. +39 050 098 9300

salesdept@idsgeoradar.com

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