

## RAPID SPATIAL ANALYTICS



### RAPID INSIGHTS

If we want to monitor our environment, be it crowding, fires, floods, air quality or traffic, we need reliable information on where and when events occur. New sensor technologies make knowing what is happening as well as where it is happening much easier to monitor. But pulling this data together to inform and execute actions in real time is more difficult.

Our Rapid Spatial Analytics program will ask how can we turn these rich data sets, and the location information linking them, into useable knowledge and actionable decisions? How can we monitor crowding at train stations or on city streets during emergencies? How can information be used proactively to improve business outcomes? How can we fly drones over forests to return real-time tree counts, biomass estimates and invasive species information?

The program is already discovering ways to connect and integrate data sets, making it easier to generate meaningful information, collaborate and inform decision-making.

### OUR CONTRIBUTION

For the past 15 years our multi-disciplinary research teams have developed standardised automated processes for assessing the quality of LiDAR and mobile imagery data. We have worked with our partners to help disadvantaged communities understand the effects of climate change and sea level rise. We've pioneered feature extraction methodologies, open spatial analytics and quality assessment tools to reduce duplication, standardise algorithms and increase transparency and collaboration.

Improved statistical and computational methods, coupled with the exponential growth of storage and computational capacity, bring with them the ability to rapidly deliver new insights from data. With our partners we have been developing innovative ways to take advantage of the big data and sensor revolution. Our tools are providing a focal point for the spatial community to come together to create, share, re-use and adapt these growing spatial data sets.

### RESEARCH FOCUS



The Rapid Spatial Analytics program focusses on revolutionising the way in which spatial analysis is done to inform decisions. Key areas of the new approach will progress Australia and New Zealand's capabilities in Industry 4.0 and will shift the culture of the spatial community.

#### FROM

- Post-processed .....> Real-time analytics
- Data processing .....> Informed decisions
- Dedicated data collection .....> "Data of opportunity"
- Black-box analytical processes .....> Open, documented processes
- Ad hoc, rigid methods .....> Standardised, flexible, repeatable analysis
- 2D data analytics .....> 3D/4D analytics
- Custom built models .....> Machine learning and automation

#### TO

## THEMES



### OPEN ANALYTICS

Will allow us to harmonise, standardise and share algorithms and workflows, saving time, effort and avoiding duplication.



### REAL-TIME ANALYTICS

Will let us acquire insights into what is happening as it happens, and give decision-makers the ability to proactively address issues as they arise such as crowding at train stations.



### CONTEXT ANALYTICS

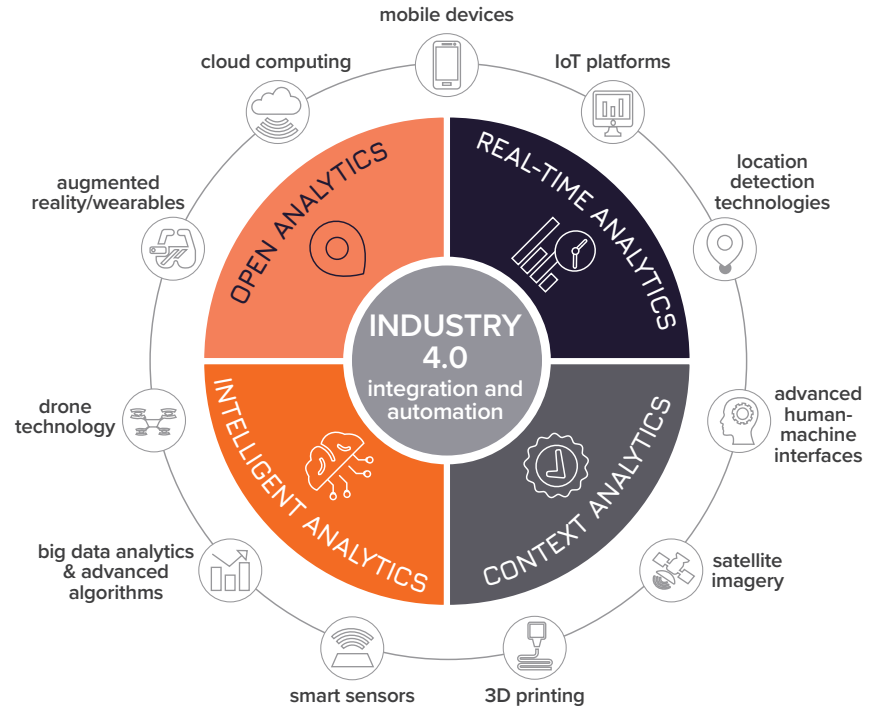
Will allow us to know that the data we are collecting is appropriate for the intended purpose and will move quality assessments onto devices and within data streaming platforms to support real-time analytics.



### INTELLIGENT ANALYTICS

Will let us use machine learning and AI to take advantage of the explosion in spatial data, and will transform our analytics from two dimensions to three and four dimensions with the use of virtual and augmented reality.

## RAPID SPATIAL ANALYTICS PROGRAM DRIVERS



## AIMS

- Create methods to connect and integrate data sets from multiple sources and automate these processes.
- Build an open library of non-technical workflows for spatial analytics processes to be created, shared, re-used and adapted.
- Coordinate the development of a National Spatial Analytics Capability.
- Build systems able to analyse data streams as they are collected.
- Support Industry 4.0 through data integration and automation.

## OUTPUTS

- Improved decision-making and service delivery.
- Efficient, effective, autonomous workflows.
- Automated information extraction from different sensor sources.
- Real-time insights for proactive decision-making.
- Culture change towards sharing analytics.
- Real-time people movement and environmental monitoring.
- Online tools for bringing disparate data sets together.

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We know where.

### FOR MORE DETAILS CONTACT

Nathan Quadros, Chief Commercial Officer

P: +61 452 226 284 E: [nquadros@frontiersi.com.au](mailto:nquadros@frontiersi.com.au)

[frontiersi.com.au](http://frontiersi.com.au)