

Project 2.02 | Multi-source Data Registration

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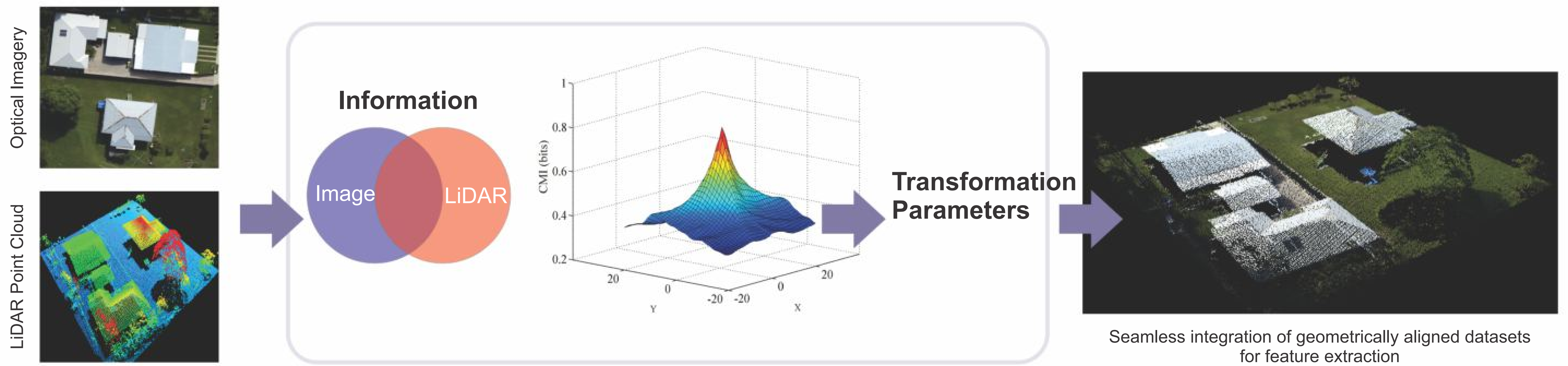
Objectives Automatic registration of space/air-borne imaging and ranging sensors for topographic mapping, geo-database update, and change detection

Outcomes Improved algorithm and software for the efficient geometric alignment of complementary remote sensing data that differs in

- Sensor type
- Resolution
- Time

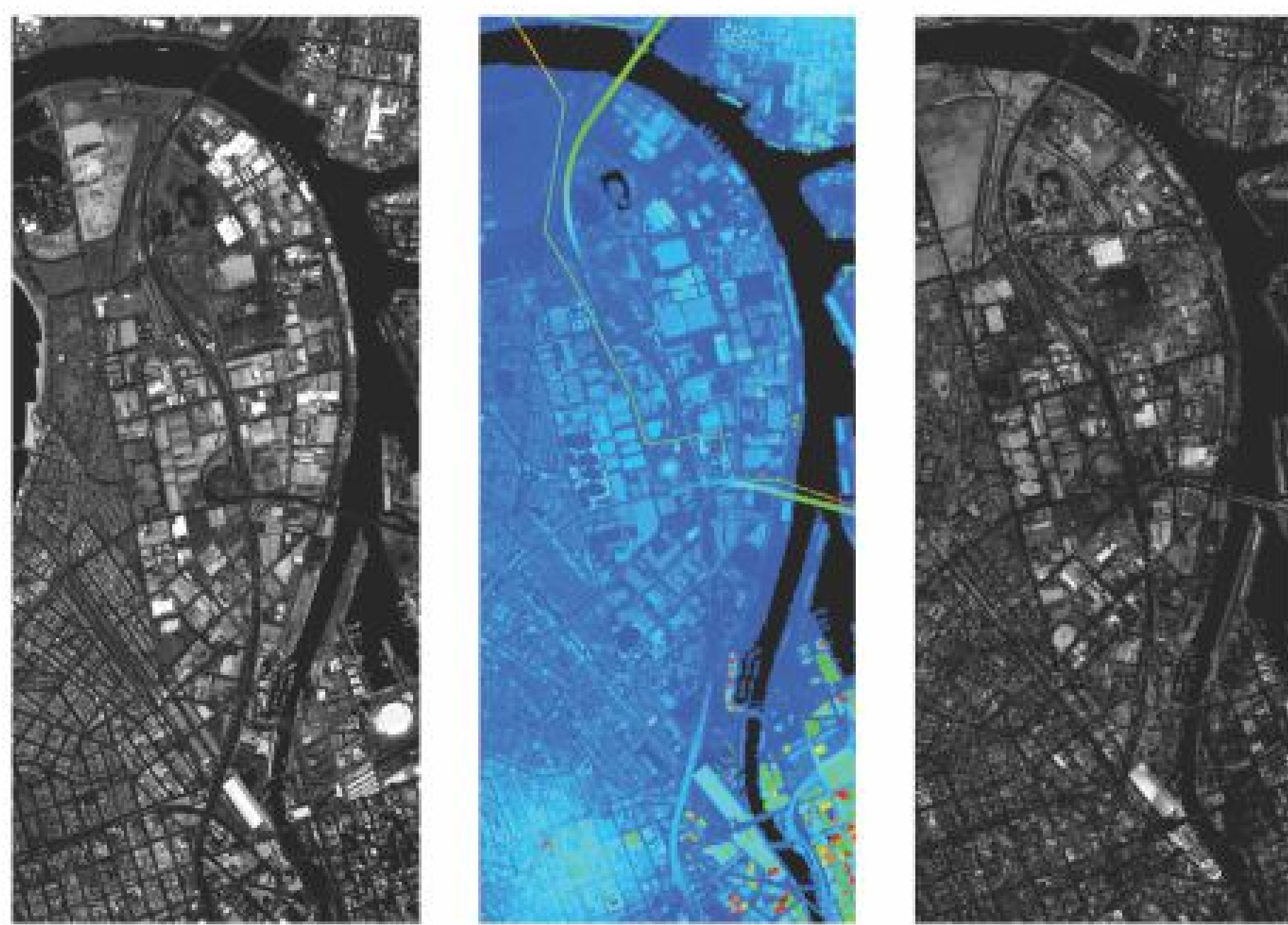
Project Achievements: An innovative technique to automatically align disparate spatial datasets

The procedure of automatic registration of multi-sensor data using statistical similarity



The fusion of multiple datasets into a single source enables a suite of new tools and visualisations for more informed decisions

City area (Melbourne, Vic)

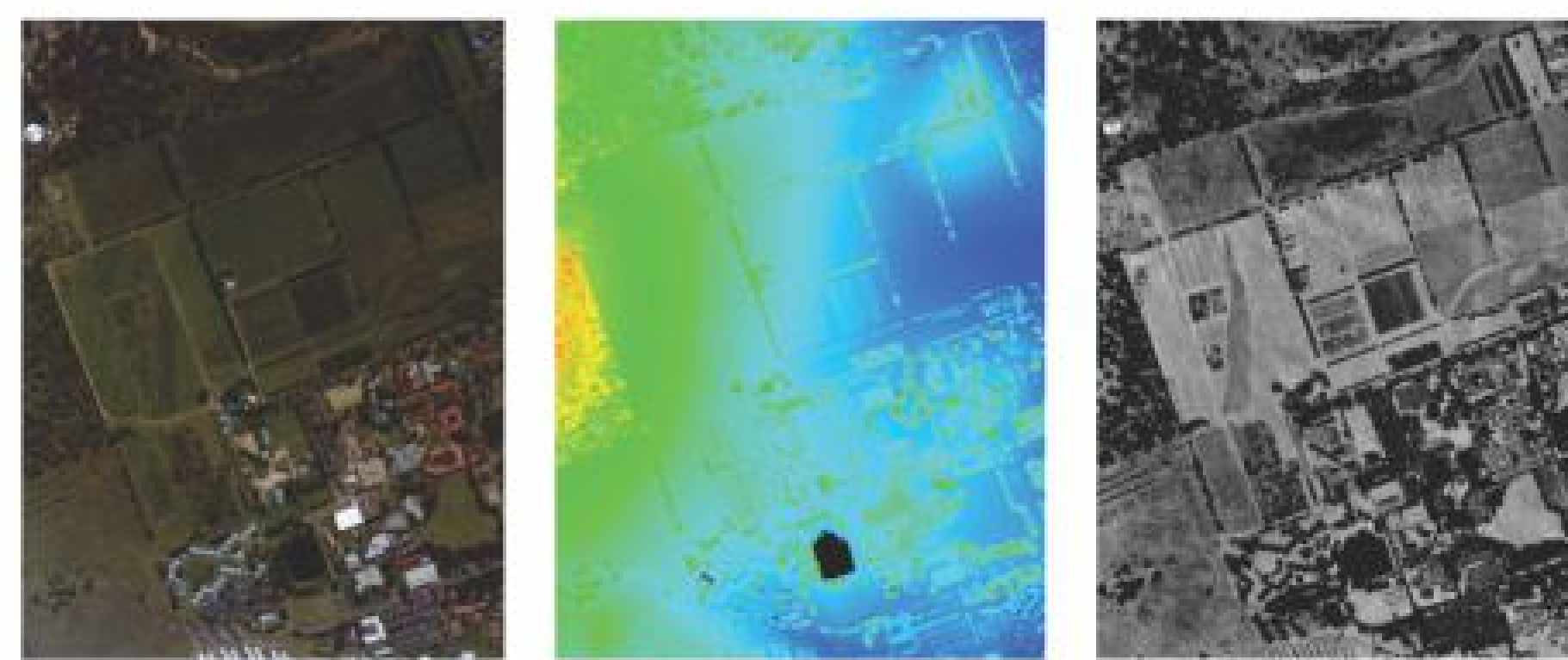


WorldView II LiDAR DSM and Intensity (4 pts/m²)

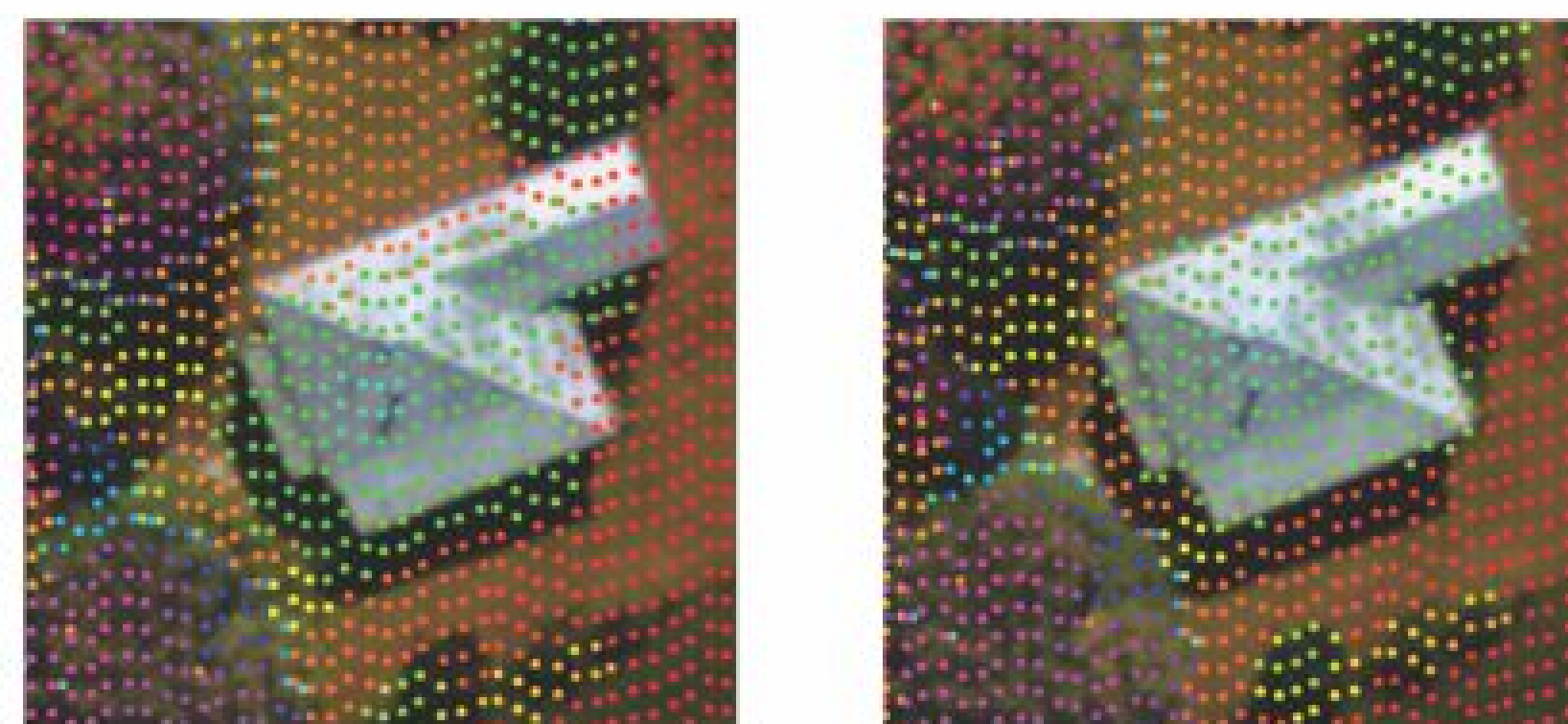


Colourised 3D point cloud

Rural area (Bathurst, NSW)



Aerial image (20 cm GSD) LiDAR DSM and Intensity (4 pts/m²)

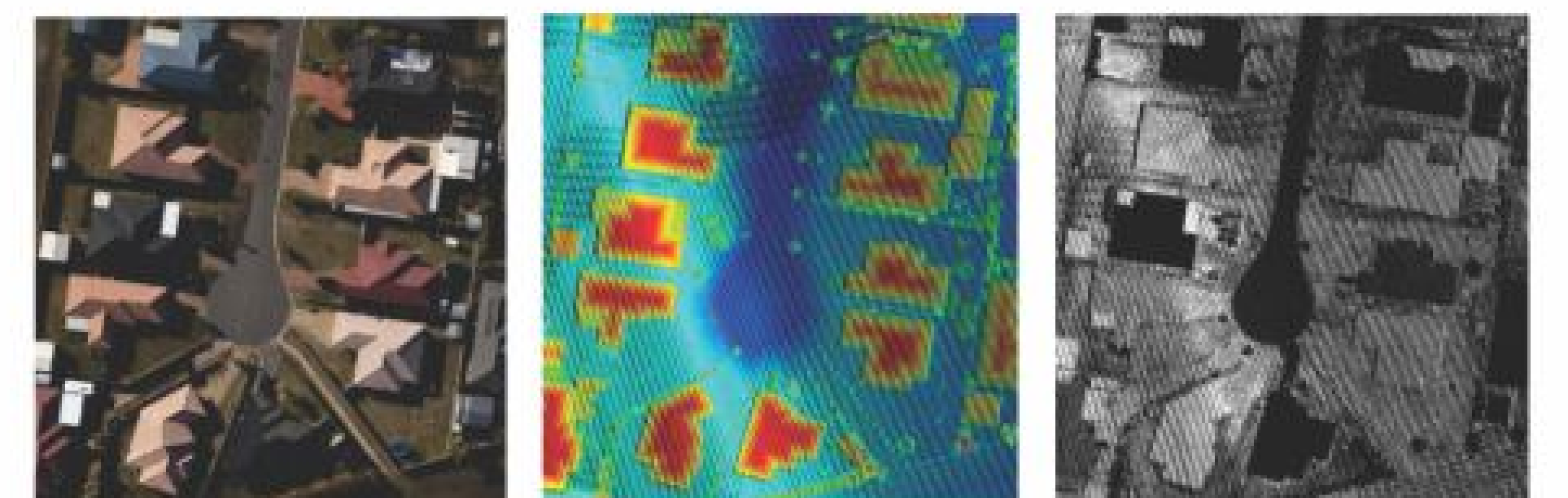


Overlay of LiDAR data and aerial image before and after registration

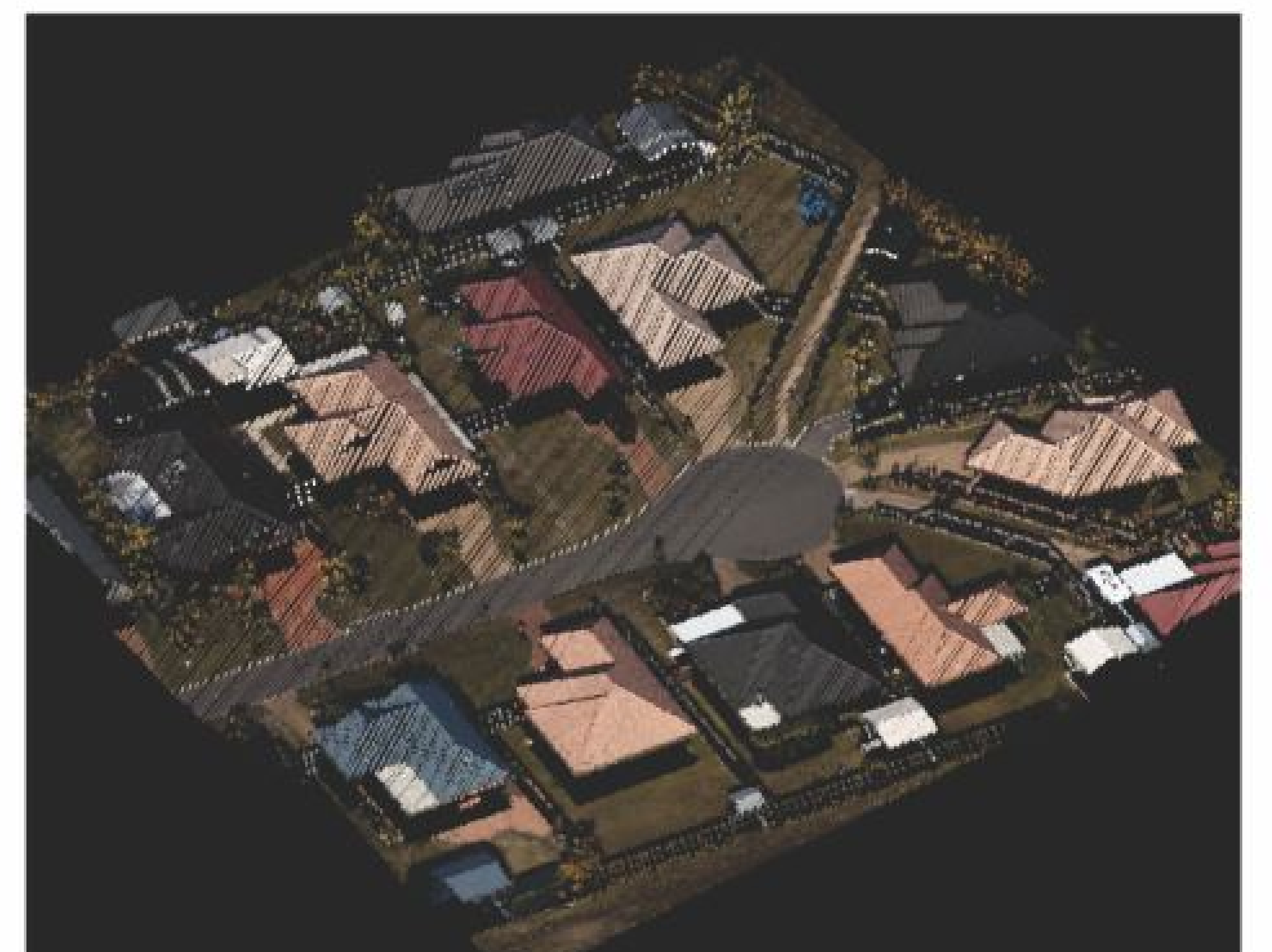


Colourised 3D point cloud

Residential area (Hervey Bay, QLD)



Orthoimage (5 cm GSD) LiDAR DSM and Intensity (35 pts/m²)



Colourised 3D point cloud

Issues

- Different levels of detail
- Gathered at different times
- Physical changes to the environment, high-rise buildings

Summary

- Registering 2D images with 3D LiDAR data using proposed and traditional methods with the internal accuracy of 0.12 and 0.82 pixels, respectively
- Decreasing the cost of geo-referencing imagery by not requiring ground control points