

Hovermap: UAV Lidar Mapping Payload

Hovermap is a 3D lidar payload suitable for small Unmanned Aerial Vehicles (UAVs), combined with CSIRO’s advanced Simultaneous Localisation and Mapping (SLAM) solution. This combination allows low-cost, high-resolution UAV-based lidar mapping.

World Leaders in Lidar Mapping

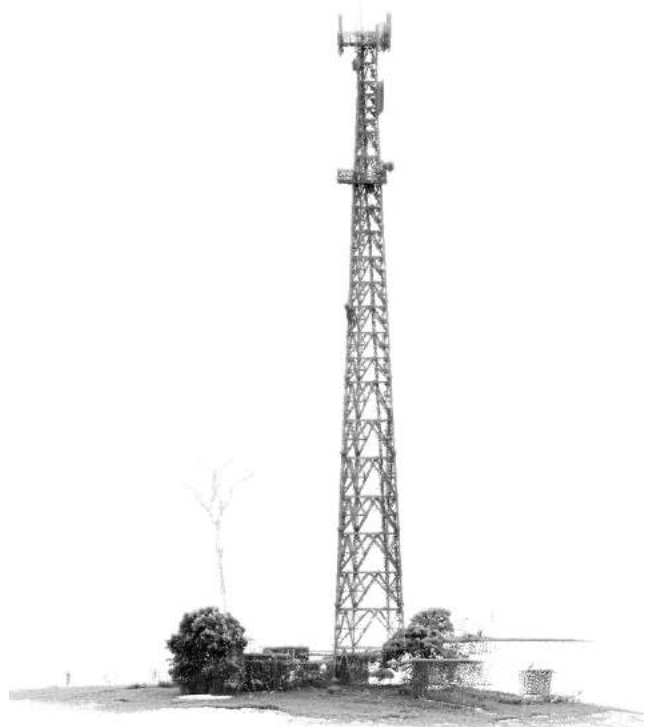
We developed our world-leading continuous-time SLAM solution and handheld Zebedee 3D lidar mapping device in 2009 and have commercialised this in the form of the ZEB1¹. Hovermap puts a new spin on this technology by continuously rotating the lidar in a configuration specifically designed to provide a full spherical view around a UAV. Hovermap utilises the same Zebedee data processing software to generate accurate 3D aerial lidar maps without using GPS.

Hovermap Payload

The payload is a self-contained unit, which includes the laser scanner, data logging computer and rotation mechanism. It has been designed to minimise occlusions from the UAV airframe, providing a full spherical scan pattern around the UAV. This makes it suitable for mapping indoors, underground and in cluttered environments where walls, floor and ceiling all need to be mapped. It can be mounted to any UAV and does not require compatibility with specific autopilots.

Map Generation

Lidar data is logged onboard to removable storage media during a mapping flight and then uploaded to a server for processing. CSIRO SLAM algorithms are applied to the raw data to produce the 3D cloud, which is made available for download from the server.



¹ Available through GeoSLAM, <http://www.geoslam.com>

3D point cloud generated from outdoor flight

Benefits

- No GPS required for mapping
- Self-contained mapping solution – fit to any VTOL UAV
- Spherical Field of View – map below, above and all around
- Individual maps can be automatically fused to generate a larger map, or fused with Zebedee-generated maps to combine aerial and terrestrial-based maps.

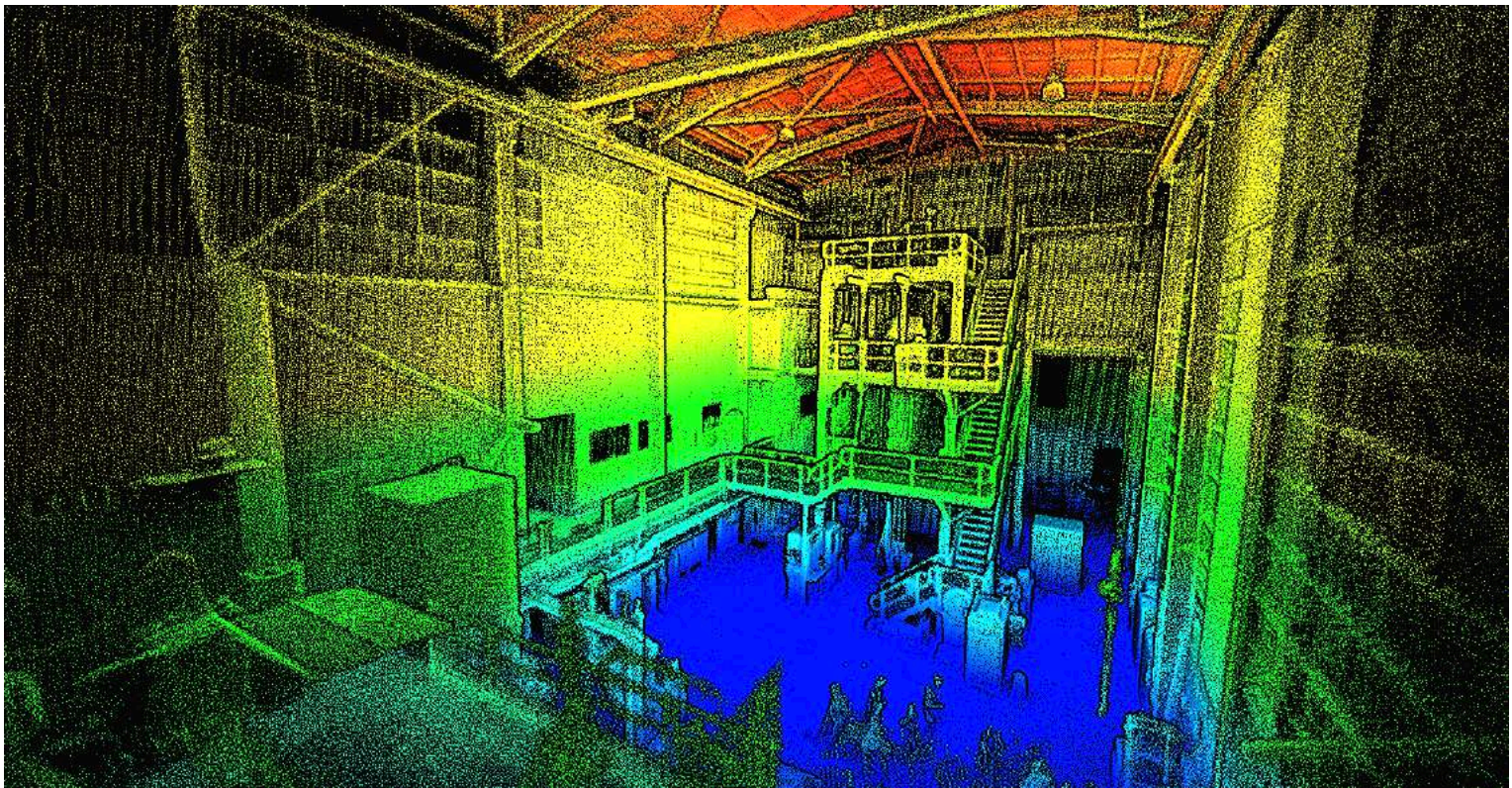
Applications

- Asset management
- Infrastructure and building inspection
- Forensic crime scene mapping
- Underground mine mapping
- Construction site mapping
- Power line mapping

Specifications

Lidar Range	Up to 30m (20m outdoors)
Angular Field of View	360 x 360 degrees
Max Map Size	Unlimited*
Data Acquisition Speed	Up to 41,600 measurement points/sec
Recommended Flight Speed	1-2 m/s (scene and spin rate dependant)
Spin Rate	0.5 – 1 Hz (adjustable to suite scene and flight speed)
Angular Resolution	0.65° vertical, 1.8° horizontal (@0.5Hz spin rate)
3D Measurement Accuracy	+/- 0.1% (typically)
Laser Safety Class	Class 1 Eye Safe
Power	18 – 24W
Weight	1130g (current prototype)
Point Cloud Format	.laz, .ply

* INDIVIDUAL MAPS LIMITED BY AVAILABLE ONBOARD STORAGE. SEPARATE MAPS CAN BE MERGED



3D point cloud generated from indoor flight

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FOR FURTHER INFORMATION

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