OXTS

CASE STUDY

Ordnance Survey

Ordnance Survey partners with OXTS to create a scalable and reliable mobile mapping and point cloud data collection system.

PROJECT AIM

Ordnance Survey historically used expensive high-grade technology to create accurate, georeferenced point cloud maps for feature identification and classification. Though effective, the solution wasn't manageable or sustainable for the Ordnance Survey's long term data collection programme. The team required a lower-cost setup that was simple to use and could easily scale, while still delivering the required levels of accuracy and reliability.

CHALLENGES

+ Build a mobile mapping solution that could create georeferenced 3D point clouds of the environment.
+ Design the system to be small enough to mount on one of the Ordnance Survey's small survey vehicles.
+ Find a method of synchronising localisation and LiDAR data without relying on ground control points.
+ Ensure the system was as affordable as possible while still performing to the required standard.

SUMMARY

Company:
Ordnance Survey

Industry:
Public Sector

Country:
United Kingdom

Website:
www.os.uk

OXTS Hardware:
xNAV650 GNSS/INS

OXTS Software:
OXTS Georeferencer
Boresight Calibration
gx/ix tight-coupling

Other Technology:
Velodyne VLP-16 LiDAR

THE SOLUTION

Ordnance Survey engaged with our UK-based channel partner, Datron Technology, and designed a solution including a Velodyne VLP-16 LiDAR, 8 x 360-degree cameras (with redundancy for future sensor fusion) and an OXTS xNAV650 GNSS/INS. The solution is mounted on a Streetdrone Twizy which is a self-driving capable vehicle.

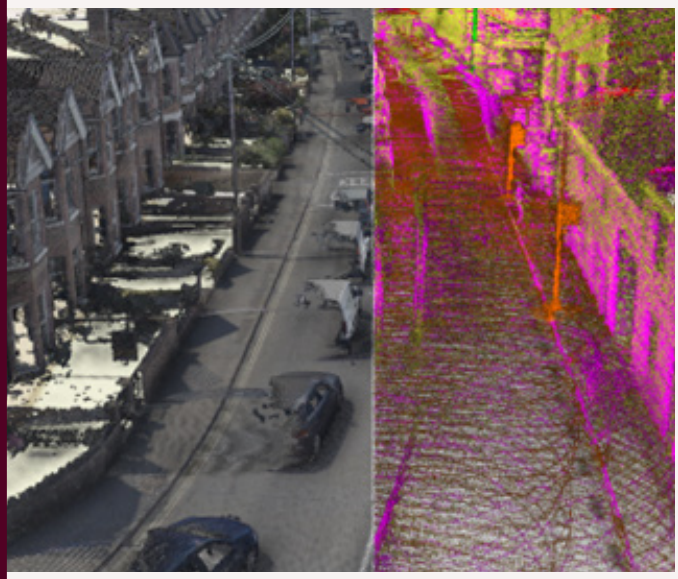
The xNAV650 combines MEMS IMU sensors, survey-grade GNSS receivers, and advanced calibration and data processing capabilities that enable the Ordnance Survey to capture highly accurate position, navigation (heading, pitch and roll) and timing measurements. In particular, the gx/ix tight-coupling capabilities of the xNAV650 preserve position accuracy even in urban areas, so that surveyors can trust their data wherever they work.

OXTS Georeferencer was a crucial differentiator for the Ordnance Survey. Its built-in software integrations with many LiDAR sensors, including the Velodyne VLP-16, greatly sped up integration timelines, and post-processing workflows, while the boresight calibration tool in Georeferencer precisely calibrates the GNSS/INS and LiDAR positions pre-mission, eliminating blurring and double vision from the final point cloud.

PAYLOAD SPEC

The xNAV650 and LiDAR included on the payload have the following specification:

- Position accuracy: 0.02 m (RTK/PPK)
- Roll/pitch accuracy: 0.05°
- Heading accuracy: 0.01°
- Data processed using NAVsuite and OXTS Georeferencer
- LiDAR range accuracy: up to ±3 cm (typical)



RESULTS

Ordnance Survey has found that data gathered using the OXTS solution is just as useful and impressive as data gathered from a far more expensive aerial LiDAR survey, coupled with a simple and straightforward workflow. Ordnance Survey is now exploring scaling up its fleet of mobile mapping vehicles.

“The biggest change has been the convenience of the off-the shelf nature of the collection, and the processing. This has saved many development hours. The software has also been very intuitive to use”

James Clarke,
Research Software Engineer,
Ordnance Survey

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