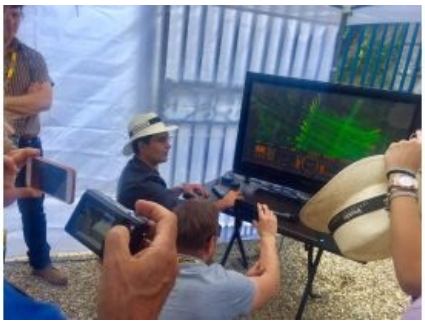
THE POTENTIAL OF EQUIPPING UAVS WITH LIDAR SENSORS

5 Questions toâ€¦Tristan Allouis, YellowScan



'GIM International' took the opportunity to ask Tristan Allouis, chief technical officer and one of the co-founders of YellowScan, a few questions on the French company's area of specialisation: Lidar mapping with drones. He zooms in on the advancing technology behind this combination, and also talks about the various applications of UAS-Lidar.

The combination of unmanned aerial vehicles (UAVs or 'drones') and Lidar is regarded as the next geospatial frontier, but the barriers are gradually being overcome. What do you see as the main developments?

The main trend is the miniaturisation of the instruments; if you compare an aerial Lidar system from 20 years ago to YellowScan's products today, the weight, dimensions and power consumption have been reduced by a factor of 20 or more. And we're striving for even lighter instruments to meet users' requirements in terms of accuracy, range, access to remote rugged terrains and near-real-time data production. In other words, we aim to do more with less. Another important development is user friendliness and reliability. Whereas the first instruments on the market were operated by specialists, now we can serve land surveyors, archaeologists, civil engineers or forest scientists with turn-key, fully integrated Lidar systems that can be mounted on any drone.

When should one consider using a Lidar-equipped UAV?

Lidar is the most suitable solution for beneath-vegetation 3D modelling and short-time data processing needs – a georeferenced Lidar point cloud can be produced just minutes after the flight without the need for ground control points. Lidar is also the best solution when shadows are an issue or light is too low. Since it is an active sensor, Lidar has its own light source and is insensitive to light conditions. A Lidar-equipped UAV has the advantage of higher productivity than terrestrial laser scanning (TLS), with lower investment and mobilisation costs than aerial laser scanning (ALS). Furthermore, using UAVs bridges the gap between the very accurate land surveying of small areas and the very large-scale, high-productivity Lidar on aircraft. The typical size of a UAV survey today is about 1 to 10 square kilometres. The UAV-Lidar also enables the survey of hard-to-access zones on foot or by aircraft. For example, one of our customers in the archaeology field succeeded in obtaining the microtopography of a 10ha archaeological site which had been discovered in the 19th century but never explored because of its thick vegetation cover.

How about combining Lidar and photogrammetry?

This combination is very interesting for architecture and industrial survey, when the combination of sharp edges from Lidar and visual information from photogrammetry is needed.

For which markets/applications does YellowScan foresee the most potential?

Mainly for topography in all its variations, civil engineering, mining, corridor mapping, forestry, archaeology, etc. There is also value in the augmented reality field for the movie and video game industries. 3D mapping for the development of autonomous vehicles can also be a great potential market. However, this application is more likely to be led by mobile Lidar, with marginal use of UAVs.

You held your International User Conference in June 2017. What were the most striking outcomes of the event?

We were pleased to welcome customers and partners from all over the world, for whom we organised high-quality presentations from expert speakers in various application fields: archaeology, forestry, power line surveying, mining and civil engineering. The attendees appreciated the case studies as they demonstrate our commitment to customer support and demonstrated how YellowScan solutions are used in so many applications, ranging from tree-growth detection and disaster recovery in Japan to power line maintenance in Spain and even archaeological vestiges of pre-Columbian raised fields in South America. Our guests enjoyed the very interactive workshops and panel discussions about the future of Lidar for drones as well as the exchange of best practices for managing a Lidar mission. They were also informed about the first urban-zone survey in France, combining UAV-Lidar, TLS and handheld Lidar to map Château de Flaugergues in Montpellier inside out.

Tristan Allouis *has been leading the development of YellowScan systems since 2012. His areas of expertise include computer science, remote sensing, technology development and forestry. After completing his master's degree in engineering, information technology and electronics at École Supérieure d'Informatique Électronique Automatique (ESIEA), Tristan focused his research on forest mapping using Lidar data. He received his PhD from AgroParisTech.*

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