



Size  
1km in  
length



Scan time  
9 minutes



Location  
Čakovec,  
Croatia



Industry  
Conservation



Scanned  
Forest

### Words by

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“47% of Croatia’s total land area is covered by forest, an area of approximately 25,000km<sup>2</sup>. Management of these vast valuable assets is a key industry in Croatia and across its central European neighbours. As well as managing the biodiversity and sustainability of the forests, it is important for commercial logging companies to assess the quality and biomass of the forests for responsible timber sales. This assessment is a growing need – every year, Croatia adds 10.5 million m<sup>3</sup> of forestry to its stock.

Methods of forestry management typically involve measuring the height, diameter and relative position of trees using equipment such as tape measures, ultrasound instruments, total stations and terrestrial laser scanners. However, there are limitations to these methods – they’re often time consuming, involve multiple setups and numerous members of staff to take the measurements (especially since forestry is usually in remote and difficult to access areas). Due to dense canopy cover, forests are usually GNSS-denied areas, and along with the uneven terrain, it can be difficult and time consuming to measure with terrestrial laser scanners.

Geocentar have a large client base in the forestry industry and upon delivery of our new ZEB HORIZON mobile laser scanner, we decided to put the technology through its paces and see how it weighs up against other solutions for measuring biomass.

“ **The ZEB HORIZON captures forestry data more accurately than traditional methods and eight times faster** ”

Visiting the Perivoj Zrinskih park, the ZEB HORIZON was initialised on a flat surface before the operator navigated around the park at normal walking pace. With a capture range of 100m, it took just 9 minutes in total to walk around the park and capture all the trees.





Back in the office we processed the data with GeoSLAM Hub software, then exported using GeoSLAM Draw. The data was then imported into an open source forestry programme called 3DForest whereupon several parameters could be measured and extracted automatically including ground extraction, tree detection, tree position detection, tree radius determination, tree height determination, tree crowns detection, crowns volume calculation and crowns collision determination.

Later we revisited the park to check the accuracy of their results and re-produced the survey using a total station with built-in REM (Remote Elevation Measurement) and a measuring tape. Not only did it take four minutes per tree to capture data due to all the total station setups, but only four parameters (diameter, height and relative position) could be calculated using these methods. If they had attempted to measure all 217 trees, it would have taken a whopping 14.5 hours!

Using the ZEB HORIZON and 3DForest software, it took 9 minutes to scan the park, 12 to process the data in GeoSLAM Hub, 5 minutes to reduce the data size in Hub and prepare the cloud for the forestry software, which took 90 minutes to

process. The total workflow took just under two hours to collect and measure all 217 trees - using traditional methods they could have surveyed just 29 trees in this time.

Geocentar calculated that results were accurate to within 3cm and were more accurate than using traditional methods, leading to great cost savings!

**GEO CENTAR**

