

Forestry virtual reality project aims to give plantations better information about quality, progress

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Plantation managers may soon be able to walk through large sections of forests, zero in on defects, check wood quality, and get a quicker overview on progress, all without leaving their office.

Researchers at the University of South Australia are working to achieve just this by collecting as much data about plantations as possible and moving it all into virtual reality.

Leading the project Spencer O'Keeffe, a PhD candidate at the university's interactive and virtual environment, said the project could be a major leap for forestry management.

"Data practices in forestry are pretty well established," Mr O'Keeffe said.

"The last sort of 100 years things have been based on the same process ... but in the last couple of years, tools for remote sensing have become more viable for use in industry.

"My work is looking at using immersive analytics tools, which are virtual reality, augmented reality and 3D environments to actually interact with virtual subsets of the forest and gain a deeper understanding of the inner workings."

Ideally, the technology will be able to run an algorithm and highlight points of interest or potential problems for plantation managers, such as hidden faults or wood quality that would be otherwise easily missed when walking through a forest.

"You would be able to optimise the process and minimise the waste," Mr O'Keeffe said.

"You would do it in a way that is repeatable and adjustable ... it will let you jump back in time 20 years and understand why decisions were made back then."

Eventually, it may be able to model the potential path of a fire or other unexpected event.

Mr O'Keeffe is the first to do this type of research in Australia.

When he started studying for his environmental science degree, he didn't expect his interest in virtual reality would lead him to forestry.

But according to Mr O'Keeffe, the nature of the industry makes it perfect for his type of research.

"It was really, really apparent to me that there's so much more science that you can do when you can look at things in three dimensions rather than two and I wanted to be involved with that from the get-go," he said.

"The way a tree grows means that it is inherently a three-dimensional problem that you can't really have a two-dimensional image of a tree that does the structure justice in with high precision.

"Whereas is we can actually put a miniature version of the tree on the table in front of you, that you can walk around and expand different features, you preserve all that information."

Only one year into his three-year project, Mr O'Keeffe's results are already proving exciting to the industry.

OneFortyOne forest digital twin program manager Michelle Balasso said she has been amazed at what could be achieved.

"What Spencer has been able to show us already, that you can visualise these trees from an office is incredible," Dr Balasso said.

"This is a new step towards the precise level of forest management that we are aiming to go towards.

"This particular project is bringing precision forestry into practice at an unprecedented level."

Currently to sample the plantation, a crew goes out into a field and documents a 20-metre radius plot manually. The process can take up to an hour for even a skilled operator to complete.

If Mr O'Keeffe's project is able to be scaled, instead just one worker would simply walk through the same plot with a backpack scanner and the work could be done in 10 minutes.

The business currently samples and documents 1 per cent of the forest per year, and extrapolates results to apply to the rest of the plantation.

"We miss 99 per cent of how the plantations may actually look," Dr Balasso said.

"It will also bring that objectivity to the measurement that takes away the subjectivity of the operator that has to measure the tree but also estimate dimensions."

With the South Australian government this week launching the strategic plan for the planned \$15 million Forestry Centre of Excellence, Dr Balasso is hopeful the project is just the start of what can be achieved.

"We aim to attract more young professionals into the industry ... it is much more sophisticated than what it seems."