



Non destructive Timber Testing Prediction of Timber Quality Sawmill Processing



Structural grading of young *Pinus patula* sawn timber

In this project we determined the strength and stiffness variation of young *Pinus patula* timber and evaluated various grading parameters that could be used for structural grading of this resource. Dynamic MOE, calculated from acoustic frequency tests on the timber, was found to be the best single predictor of stiffness, bending strength and tension strength.

Optimising the positioning of a log in front of the primary breakdown saw

Automated three-dimensional log scanning and positioning systems in a sawmill has a limited time available to reach an optimal positioning solution before primary breakdown sawing starts. In this study a search algorithm (tentacle algorithm) was developed for this task and was empirically evaluated in terms of its ability to find an optimal or close-to-optimal positioning solution in a limited number of iterations.

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Log 3D internal reconstruction for sawing simulation

The objective of this project is to create 3D images of logs including internal knot characteristics, resin pockets, year ring structure, and accurate external shape characteristics using digital photographs of the sawn surfaces of a fixed log being cross-cut. The project involve a specially designed frame with a distance measurement unit, digital camera and chainsaw attached to it. This information can be used to study wood properties and its effect on final products using sawmill simulation.

Prediction of selected mechanical product properties from standing trees

Various methods to determine structural timber quality of standing trees are evaluated in this project. Acoustic methods, branch and knot evaluation methods, and wood quality tests on increment cores are evaluated. Repeatability of the method, age-age correlations, and the relationship between standing tree acoustic wave speed and final product properties

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