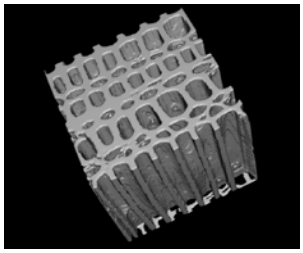

MECH 463 Mechanical Engineering Project
Virtual Cellular Wood Tissue

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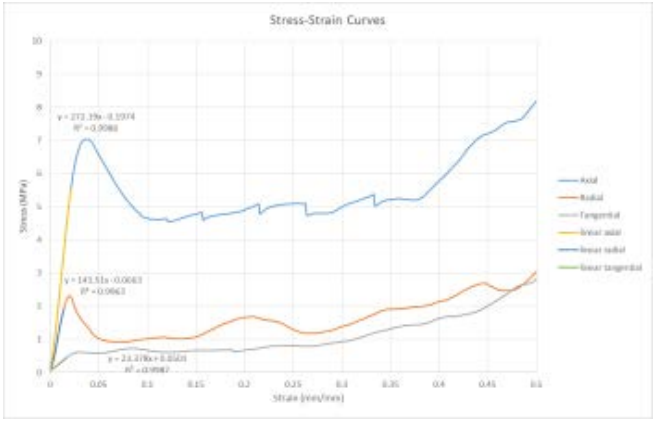
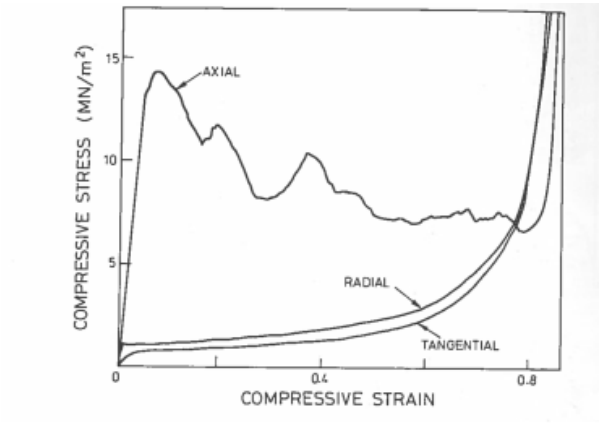
The purpose of this design project is to study the effects of the cellular microstructure of wood on its strength along different axis.

A deeper understanding of the role the cellular microstructure will allow for future cellular materials to be designed with tunable properties.

In order to study the effects of different cellular structures on the anisotropic properties (the variation of strength of the material along the different axis) samples of different cellular structure were tested in compression in order to determine the young's modulus and yield strength. These results were then compared with theoretical results and Finite Elements Analysis.





It was found that the general trends agreed between the physical tests, FEM and theoretical values. The hypothesis that increasing cell wall thickness decreases anisotropy was confirmed.