

Enhancing Student Learning through Next-Generation Digital Wood Fabrication

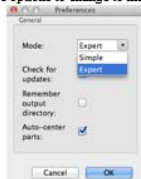
Overview

New state-of-the-art digital wood fabrication equipment has been added to the Centre for Advanced Wood Processing (CAWP) in fall 2013. Specifically these are a Hundegger® Robot-Drive and a three-dimensional (3D) printer.

Both pieces of equipment can be used for training in the concepts of next-generation digital wood fabrication and can provide unique interdisciplinary learning opportunities for students from the Wood Products Processing Program, Civil Engineering and the School of Architecture.



1. Click **File** → **Preferences...** we can change the slicer to the expert mode (fig 3). In this mode, there are more options to change to make a more specific STL file.

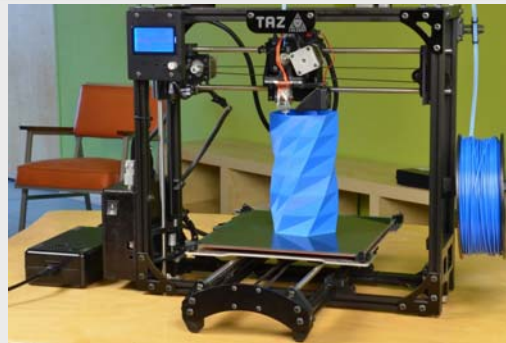


Tutorial screenshot

Deliverables

1. Three part-time undergraduate and one graduate student assistant investigate current training needs on heavy timber CNC manufacturing and 3D wood printing.
2. The student assistants create web-based tutorial materials that can be accessed by students, staff and faculty using the CAWP technical facilities.
3. The students develop tutorial guidelines on experiments with wood-based filaments using the 3D printer and for cutting heavy timber components using the Hundegger®, to create different products.
4. The students will print sample products using the 3D printer and cut advanced timber joinery using the Hundegger®. This work will be documented and published as a web-based resource.

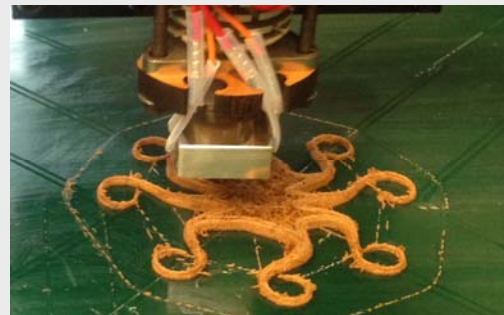
3D Printing with Wood



3D wood printer

3D printers are used to create prototypes in a very short period of time and add tremendous value and flexibility to the design process. The prototypes can be used to refine the design and manufacturing process, avoiding costly changes further down the production chain.

In a graduate student environment, 3D printers also allow for testing and exploration of ideas. The technology is of interest both due to its ability to fabricate freeform objects that are difficult to produce using current machining methods.



Object created with 3D wood printer

Heavy Timber Processing



Hundegger® Robot-Drive

The Hundegger® Robot-Drive is the most sophisticated CNC timber processor available worldwide; it facilitates the automated production of large timber cross-sections (up to 300mm x 1225mm) in any lengths and with unprecedented precision, speed and flexibility.

Further, the machine allows interfacing to sophisticated 3D design software providing direct data transfer to fabricate individual components or batches for whole buildings.



Timber Joinery created with Hundegger® Robot-Drive

