

Undergraduate Internship/Master's project

Visualizing 3D Printing

Synopsis

The goal of this project is to develop tools that allow to quickly visualize the process of 3D-printing a model. 3D printing allows rapid prototyping for advanced manufacturing; state-of-the-art 3D printers are available to all UW students at the Wyrkshop (<https://www.wyrkshop.org>). Large models can take many hours or even days to print, and being able to quickly visualize the printing process beforehand can help to identify potential problems and compare different settings for the 3D printer. This can also help to illustrate the printing process for instructional purposes.

To prepare a model for 3D printing, it is processed by a so-called slicer, which breaks down the model into simple instructions for the 3D printer; for example “move the print head to this position” and “start extruding material and move the print head to this other position”. The visualizer will allow to show the result of such commands to “see” a print happening in faster than real time.

You will

- identify and survey existing projects that could be leveraged for this (in particular OctoPrint);
- develop a parser for the output of a slicer (GCode) that identifies the different kinds of commands and their parameters;
- develop a user interface that shows the printing process, with options to adjust the speed of the animation and further information on the print.

What you should bring to the project

You should be self-motivated and able to work independently, have strong programming and analytical skills, and basic knowledge of 3D printing.

What you will get out of it

You will become familiar with state-of-the-art advanced manufacturing methods and hone your data science skills on a real-world project. Such experience is highly sought-after in industry. Depending on the obtained results, this project may be part of a scientific publication. This is a project with lots of details to be defined as part of it – you can bring in your own ideas and make it your own.

Interested? Talk to Lars Kotthoff <larsko@uwyo.edu>.