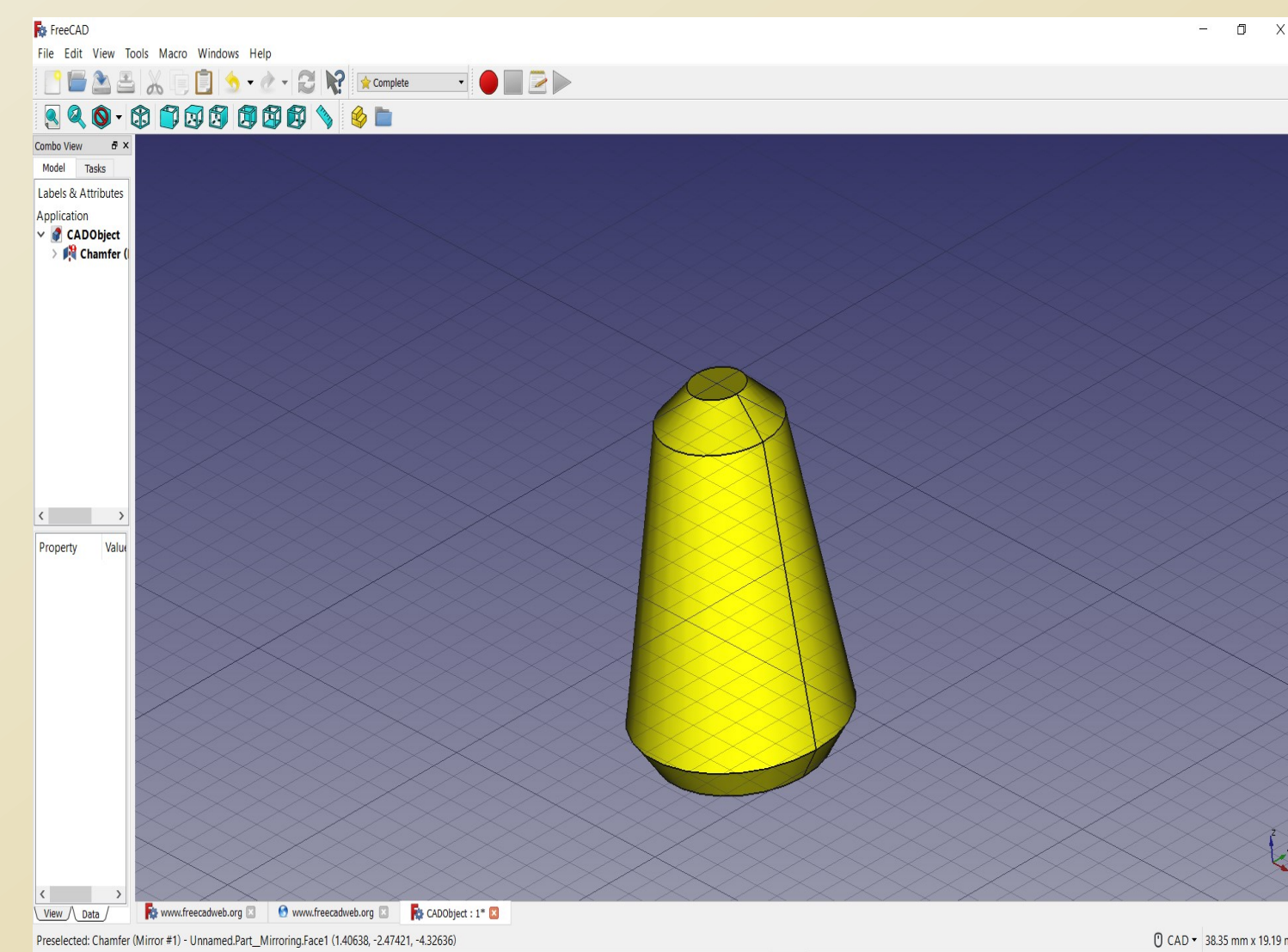


VandalForge Printer Software

Team Vulcan

Project Design Goals

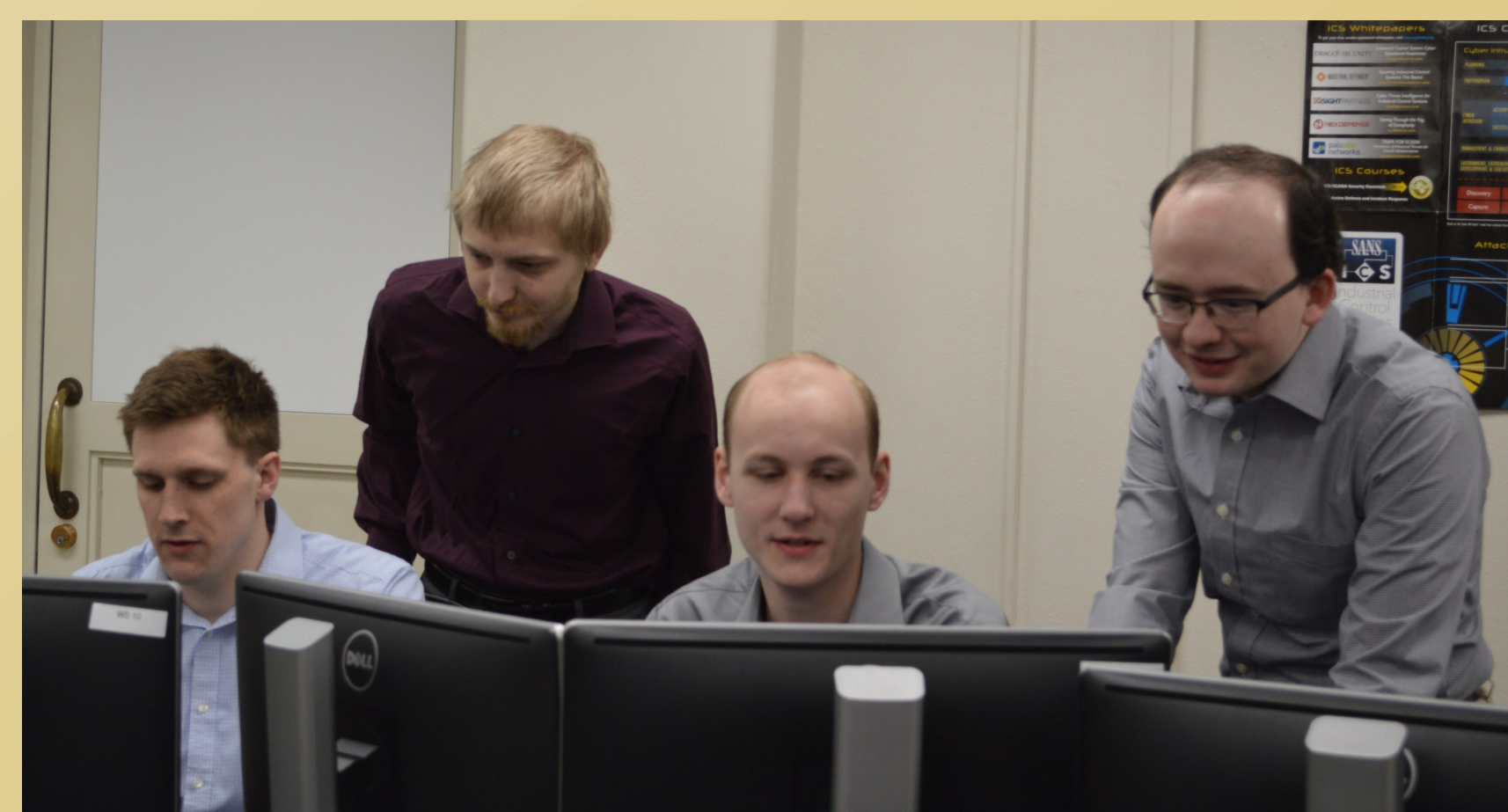
The VandalForge Software team is customizing existing 3D plastic printing software for 3D metal printers. The goal of this project was updating the graphical user interfaces (GUI) of Slic3r and OctoPrint, reworking open source software for use with the VandalForge printer, and increasing the expandability of the project for future teams.



CAD UI with Peg Object

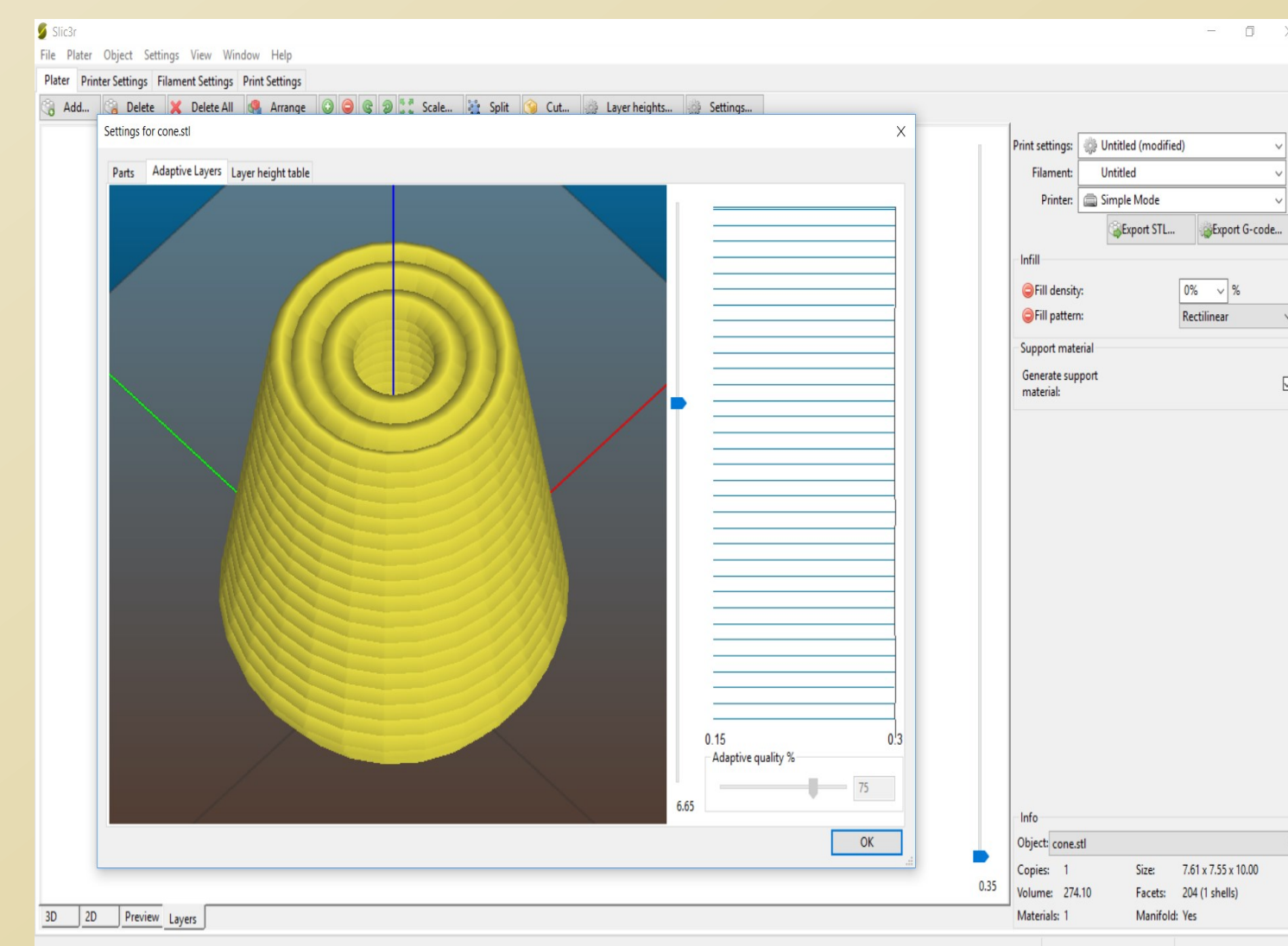
CAD

CAD (computer-aided design) software allows engineers to create three-dimensional (3-D) models and technical illustrations. CAD software creates the model and may export it in several kinds of file formats. The STL (stereolithography) file format uses a simple triangular mesh for storing the 3-D image and stores virtually no other information besides the basic shape.



Team Members (Left to Right): Tim Clemans, Jonathan Buch, Michael Madsen, James Young

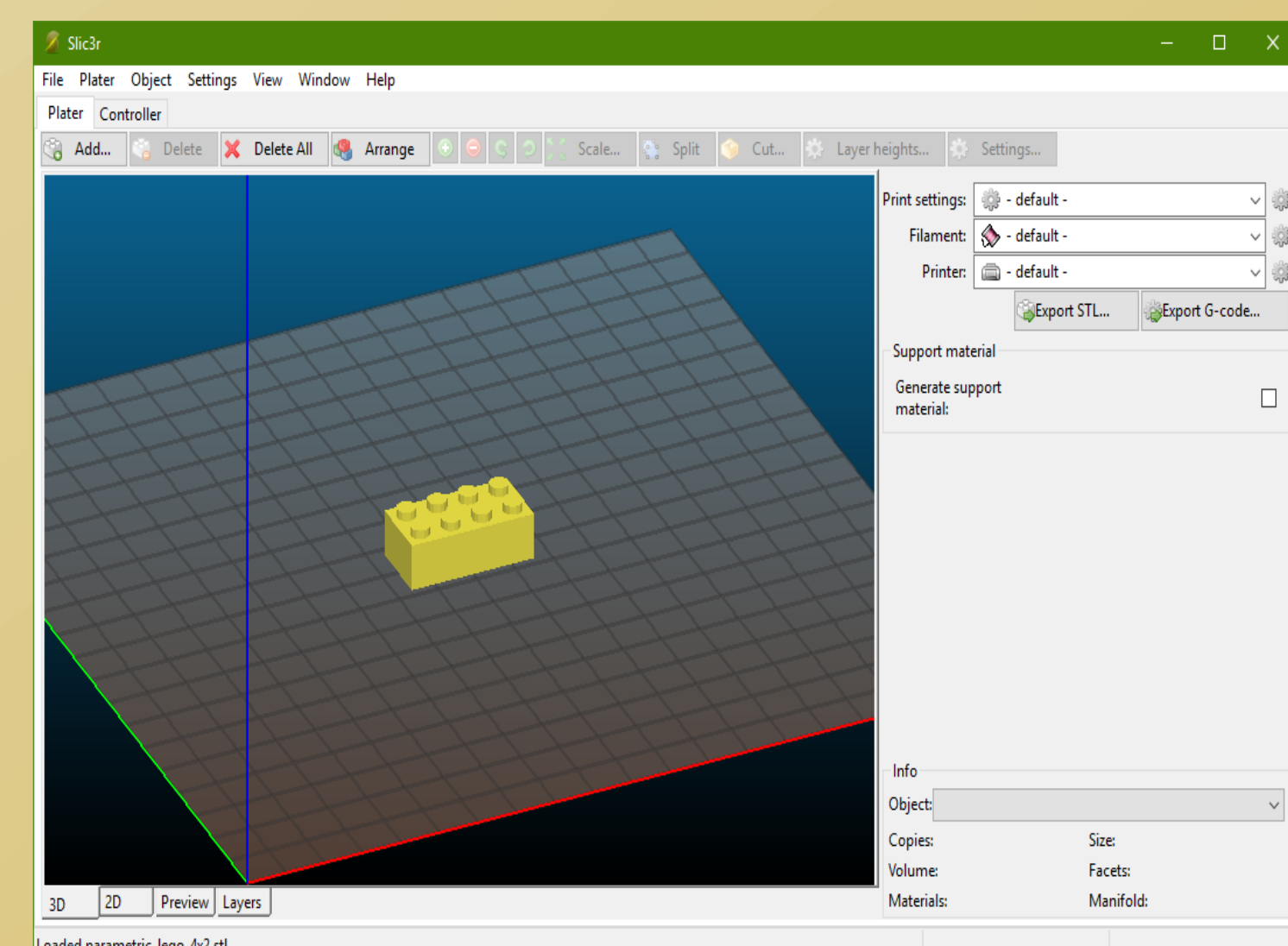
Slic3r



Peg after being sliced

Slic3r GUI

Slic3r takes in the .stl file and transforms it into a set of layers, each representing a horizontal slice of the original CAD image. These layers all have a set of coordinates known as Gcode which designates the path the printer needs to take for each layer. This Gcode is then fed into OctoPrint.



Slic3r GUI with Brick Object

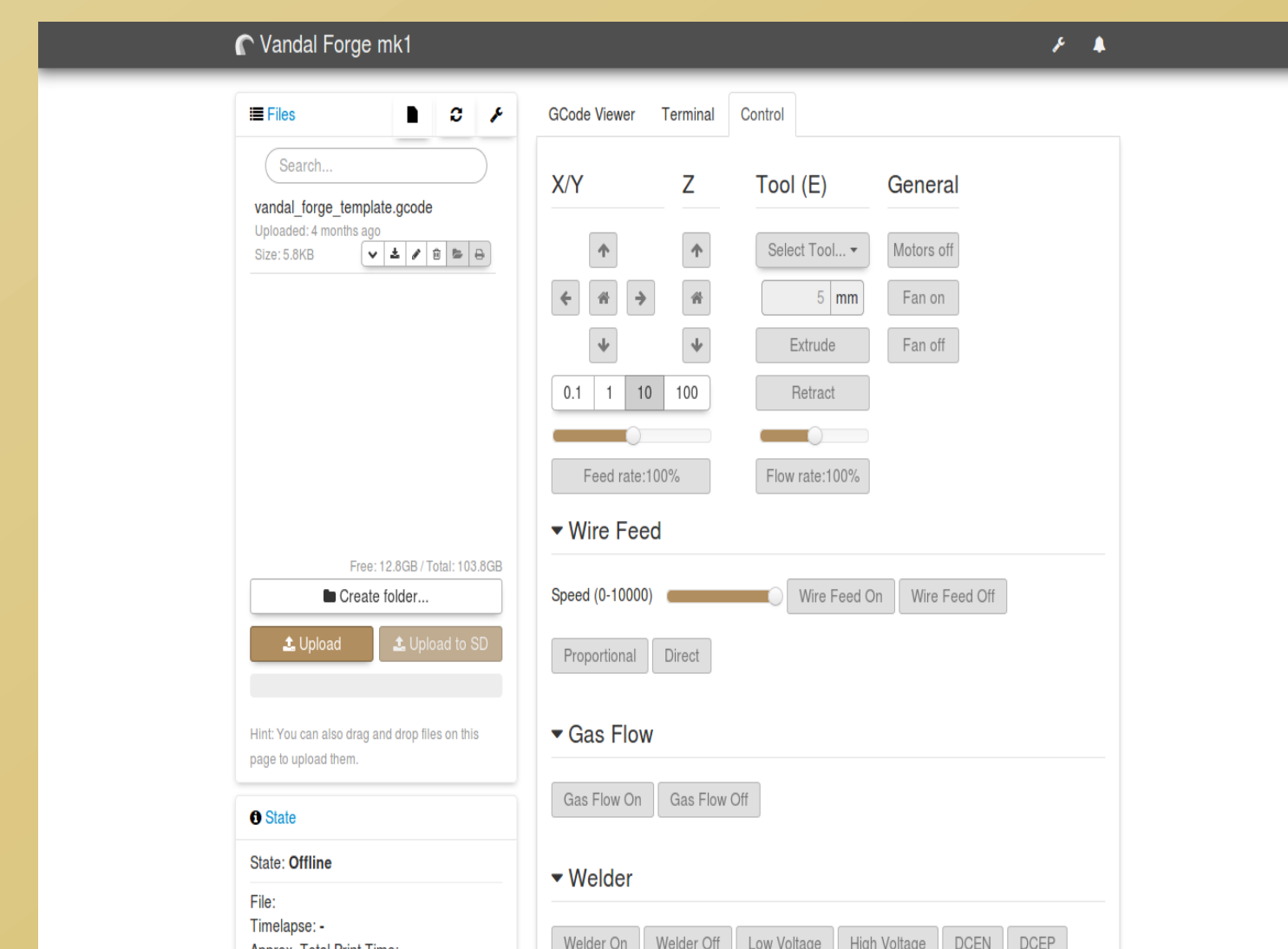
Completed Items

- Updated GCode file output
- Simplified UI to match 3D metal printing necessities
- Created a tutorial for learning Slic3r

OctoPrint

OctoPrint GUI

OctoPrint is open-source 3D printing software that acts as the interface between the print instructions created by Slic3r and the actual 3D metal printer. OctoPrint was originally designed for plastic printers, so we modified the program to send custom print commands that are necessary for the University of Idaho metal printer.



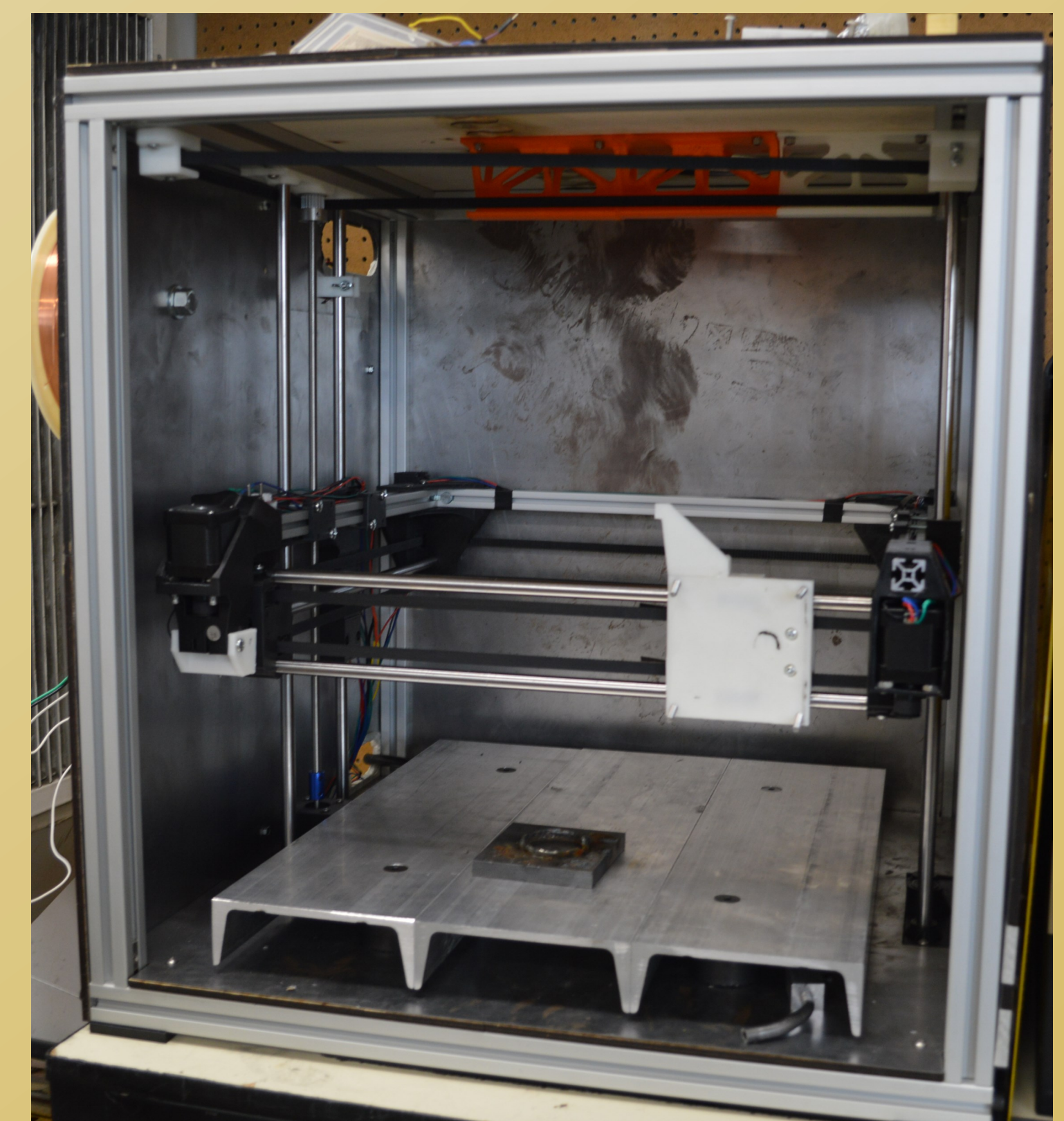
Updated OctoPrint User Interface

OctoPrint Advantages

OctoPrint makes it easy to add custom print commands to the OctoPrint interface. OctoPrint is easily tailored for metal printing purposes. The open source nature of OctoPrint allows us to incorporate improvements developed by other people.

Completed Items

- Updated and rearranged UI elements to be in line with 3D metal printing
- Created information page on the use of OctoPrint



VandalForge 3D Metal Printer Mk.2

3D Metal Printer

The 3D metal printer known as VandalForge takes the OctoPrint commands and interprets them with SmoothieWare, a Gcode command interpreter. It then follows the given set of commands, depositing each layer one-by-one until the print is complete. The completed print is then left to cool and the next print job can be started.

Acknowledgements

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Graduate Students: Andre Corpus, Matthew Buchanan

Department Mentor: Bruce Bolden

