

Project 1: Introduction to 3D Printing

ENGR 11A – Fall 2024

Assigned: Tuesday, September 3

Due: Tuesday, September 10, 9:35am

1 Project goals

- Learn to use a Prusa MINI+ 3D Printer and Prusa Slicer Software.
- Configure Prusa Slicer and download nametag and calibration 3D print files.
- Learn how to “Slice” a downloaded 3D file and prepare it to 3D Print.
- After a successful first print, run a more difficult “torture test” to better understand the limits of designing for 3D Printing.
 - By learning this workflow, you will unlock the ability to print 1,000,000+ public 3D design files, and troubleshoot minor flaws in your machine AND your design file.
- Create a website to document your work and post reflections throughout the semester.

2 Guidelines

2.1 Part 1: Nametag

1. Download and set up Prusa Slicer for a Prusa MINI+ 0.4mm nozzle (with Input Shaper):
https://www.prusa3d.com/page/prusaslicer_424/
2. Download the nametag 3MF file and edit it directly in Prusa Slicer:
<http://brandeis.app.box.com/v/prusaminifiles>
3. Receive a print job number from the Brandeis 3D printing & laser cutting tracking system via the following steps.
 - (a) Fill out the print job number request form: <https://bit.ly/3dprintjob>
 - (b) Check your email for the 4-digit print job number
 - (c) Write that print job on a sticky note and attach it to your 3d printer
 - (d) Start your print
 - (e) The number will travel with the 3D print (via sticky note) to the 3D print pickup bin
 - (f) You can look at all the submitted print jobs here: <https://bit.ly/printjobtracker>
4. Print your customized nametag
5. Read through the Prusa MINI+ Handbook:
<https://help.prusa3d.com/downloads/mini/handbook>
6. Take a picture of your nametag 3D print and write at least a paragraph documenting and analyzing your process using both the Prusa MINI+ and Prusa Slicer software. This should include detailed notes about your workflow steps and documentation used.

2.2 Part 2: Second print

7. Set up a different calibration 3D print that will push the limits of the machine (i.e., a 3D printing torture test or calibration print). Download an STL file from

<https://www.thingiverse.com/> or <https://thangs.com/> or <https://www.printables.com/>. Be sure to select a file that will push the 3D printer past what it is possible to 3D print on your machine.

8. Take a picture of your second 3D print and write at least a paragraph analyzing it. What does this tell you about the limits of what is possible to 3D print on the machine and what is possible to design in a 3D file? Make sure to also note the differences between a 3MF and an STL file.

2.3 Part 3: Personal website

9. Sign up for a Boston Public Library eCard using your Brandeis mailing address:
<https://www.bpl.org/ecard/>
10. Register for LinkedIn Learning through your new BPL eCard:
<https://www.linkedin.com/learning-login/go/bostonpubliclibrary>
11. Watch and follow along with the LinkedIn Learning course *Create a Quick, Clean, and Cheap Website with Bootstrap Templates*: <https://www.linkedin.com/learning/create-a-quick-clean-and-cheap-website-with-bootstrap-templates/>
 - Make a website with Bootstrap Templates
 - Use Git Pages to host your personal website
12. Post a reflection on your personal website about the process steps and outcome of your two 3D prints.
13. Submit your assignment by sharing a link to your website reflection on the Slack #homework channel.

3 Resources

- Here is the exact model 3D printer used in this assignment: <https://www.prusa3d.com/product/original-prusa-mini-semi-assembled-3d-printer-6/>
- Prusa MINI+ resources: <https://help.prusa3d.com/tag/mini>
- Analyze and troubleshoot your printer:
<https://www.simplify3d.com/support/print-quality-troubleshooting/>
- How to use 3DBenchy to test and calibrate your 3D printer:
<https://www.3dbenchy.com/dimensions/>
- Bootstrap templates: <https://startbootstrap.com/themes>
- Getting Started with GitHub Pages:
<https://docs.github.com/en/pages/getting-started-with-github-pages>

4 Grading

Adherence to guidelines	30%
Class participation	20%
Write-up quality	40%
Website/3D print quality	10%