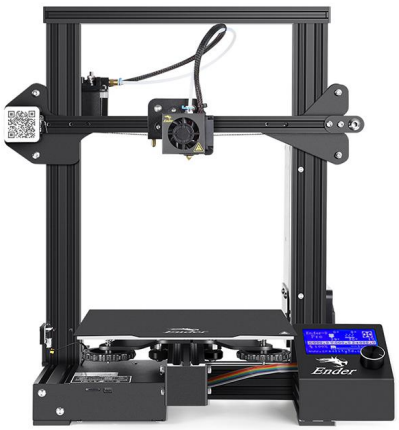
Secure and Remote 3D Printing
Milestone Progression



Tiffanie Petersen - tpetersen2018@my.fit.edu

Isaiah Thomas - ithomas2018@my.fit.edu

Carl Mann - cmann2013@my.fit.edu

Nick Contrell - ncontrell2019@my.fit.edu

Sponsored by

Dr. Siddhartha Bhattacharyya - sbhattacharyya@fit.edu

Client

Mike C Newton

Progress of current Milestone (progress matrix)

Task	Completion %	Tiffanie	Carl	Isaiah	Nick	To do
1. Investigate tools	100%	30%	30%	30%	10%	none
2. Hello World demos	100%	10%	40%	40%	10%	none
3. Requirement Document	100%	33%	34%	33%	0%	none
4. Design Document	100%	33%	33%	34%	0%	none
5. Test Plan	100%	0%	0%	0%	100%	none
6. Django framework/ Web development	100%	10%	45%	45%	0%	Implement extra features during milestones 2 & 3
7. Working with the Ender-3, limited knowledge of G-code and 3D modeling	100%	33%	33%	33%	1%	Printer currently is with other team and was broken last time we met
8. Milestone Progress Evaluation	100%	100%	0%	0%	0%	none

1. Discussion (at least a few sentences, ie a paragraph) of each accomplished task (and obstacles) for the current Milestone:
    - Task 1: Our original project was to build a web application, using Django, to monitor the status of the 3D printer while communicating with Octoprint. Instead we found that Octoprint has the capability to do everything that our web application needed us to do. Because of this we have reworked our Django plan to create a page for users to submit their G code as well as a page for the admin to approve/decline users requests. While also keeping the capabilities of monitoring progress of the prints. We also found that we need to use SQLite for the database of all the prints that are in the queue. We plan to use Wireshark to analyze what G code

traffic is being transferred between the printer and Octoprint.

- Task 2: For our “hello world” demo we have created the base web application which allows users to upload their projects. There currently is an upload page that allows a user to upload their file. The application then gives the user feedback stating that the upload was successful.

- Task 3: The requirement document was written to lay out the requirements for this project. We decided to break our requirements down into five separate categories to better organize ourselves for success.
    1. Security
        - Focuses on ensuring attackers cannot gain access to the web application and user data.
    2. User Interface
        - Focuses on how users will interact with the web application that will allow for uploads, monitoring, account creation, etc.
    3. File Uploading
        - Handles the front/back end that is required for taking the user uploaded files and checks for security risks.
    4. Queue
        - The requirements for the queue layout state how the queue should be able to be filtered, altered, and monitor the progress of all the user projects.
    5. Backend Implementation
        - Django will be our framework for the web server as well as the median for many of our security solutions.

- Task 4: For the design document we outlined what the project was about and why we were interested in solving this problem. We talked about the lack of web applications for 3D printing as well as the security concerns that were present during the printing process. We created many diagrams to lay out how the web application will look and how it will run. We also took note of how the website will be hosted as that is a major part of our project.

- Task 5: Our test plan is broken into two parts: functionality tests and security tests. For our functionality tests we have decided to test the network connectivity for the web application, user account creation, and restricted access to web pages. Our security tests will include cross-site scripting attack, input sanitation (anti SQL injection) and DOS protection. The first phase of our project will solely focus on the functionality tests as the web application must be complete before moving onto pen testing.

- Task 6: While implementing the Django web application we found that creating an upload page would be the best way to demo the “hello world”

aspect for our project. Since it was the best starting point for not only our project but getting to know how Django worked with different user input.

- Task 7: To learn more about 3D printing we looked into what kinds of files the printer accepts. We found that the printing software is open sourced which allows us to prepare for the cybersecurity section of our project. We found that Octoprint also is open source and allows for the input of GCode. For 3D modeling we could use CAD to create models for the 3D printer or we could find files online for testing the printer.

2. Discussion (at least a few sentences, ie a paragraph) of contribution of each team member to the current Milestone:
   - Tiffanie Petersen: So far this milestone she has worked on all the documents as well as kept the team on track to meet deadlines. She also has been in charge of creating presentations, planning, and handling all the reformatting to make the deliverables professional.
   - Carl Mann: Carl has been in charge of keeping an open line of communication with Dr. Sid as he was the initial point of contact. Carl has also worked the most with Django to get a demo working and solved issues pertaining to the file upload. He has worked on the latest documents that are required for this upcoming deadline. He also led the presentation for this project.
   - Isaiah Thomas: He has supplemented Carl in the development of the upload page as well as worked on most of the documents thus far. He also made a point of making the presentations more professional.
   - Nick Contrell: Nick so far has worked on the test document and helped to discover tools we need for the project. Attended some of the team meetings.

3. Plan for the next Milestone (task matrix) or [skip if this is for Milestone 6]

Task	Tiffanie	Carl	Isaiah	Nick
1. Implement, test & demo *front end of the web application*	Test to ensure that the web application functionality was not broken during the rework of the style	N/A ➔ Working on backend	N/A ➔ Working on backend	Javascript framework to add style to the web application

2. Implement, test & demo *user features for uploads and creating accounts*	Implement user remove requests (no longer wants their project to be printed)	Test that users must be logged in to upload files and that accounts can be created ● Accounts cannot be created on the same email	Implement user privileges and authentication	N/A ➔ Working on front end
3. Implement, test & demo *Admin account abilities*	N/A ➔ Working on user features	Implement admin page for accepting/declining print requests ● Admin can delete projects from the queue	Primary demo for all user/admin account creation	Test that only the admin user can accept/decline and remove projects

4. Discussion (at least a few sentences, ie a paragraph) of each planned task for the next Milestone or "Lessons Learned" if this is for Milestone 6
    - Task 1: We plan to create a more appealing web application while also ensuring that the style does not interfere with user experiences. For example the style should not block or inhibit users from seeing where they should upload files, login, submit removal requests, etc. The style should also be professional and follow all rules of trademarks as to not cause any issue in regards to copyrights etc.

    - Task 2: User features include the ability to upload files once logged onto the web application. They also allow the user to request to delete their projects from the queue, as long as the project is not currently in progress. Each user will be limited in their privileges to ensure that the application is secure and the only user who can modify the queue would be the admin (task 3).

    - Task 3: The admin account will be the only user who can modify the queue, accept/decline requests, and handle any issues with the user uploaded files. The admin will need to have permissions to alter and see pages that a normal user would not be able to access.

5. Date(s) of meeting(s) with Client during the current milestone:
    - None

6. Client feedback on the current milestone
    - The client will be met once the project proceeds further. Depends on when Dr. Siddhartha Bhattacharyya decides the product is ready
7. Date(s) of meeting(s) with Faculty Advisor during the current milestone:
    - September 17th
    - September 30th
8. Faculty Advisor feedback on each task for the current Milestone
    - Task 1:
        1. Look into hosting applications on a raspberry pi. Make sure the raspberry pi model currently available has sufficient specifications.
    - Task 2:
        1. User uploads is a good start to show how Django will work for this project.
    - Task 3:
        1. Develop ideas further regarding octoprint's role in the process of printing.
    - Task 4:
        1. none
    - Task 5:
        1. Security tests for web application only (3D printer next semester)
    - Task 6:
        1. Make sure the web application interfaces with octoprint.
    - Task 7:
        1. none

Faculty Advisor Signature: _____ Date: _____

Evaluation by Faculty Advisor

- **Faculty Advisor: detach and return this page to Dr. Chan (HC 214) or email the scores to pkc@cs.fit.edu**

- Score (0-10) for each member: circle a score (or circle two adjacent scores for .25 or write down a real number between 0 and 10)

Tiffanie Petersen	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
Carl Mann	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
Isaiah Thomas	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
Nick Contrell	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10

Faculty Advisor Signature: _____ Date: _____