SIMULATOR FOR FIREFLY FLASHING SYNCHRONIZATION STUDIES

MON-21:
Mohammad Samiuddin Shafi (22B3912)
Shivam Panwar (22B3965)
Sumanth Gogineni (22B3915)
Lokesh Borra (22B3906)
Yashwanth Juluwa (22B1271)

Feedback from milestone 2

We were asked to show the video demo of the proof concept

Actions - Although we did test out our circuits and made a proof of concept but didn’t record it.
So we did the setup again and this time recorded it.

Demo Video

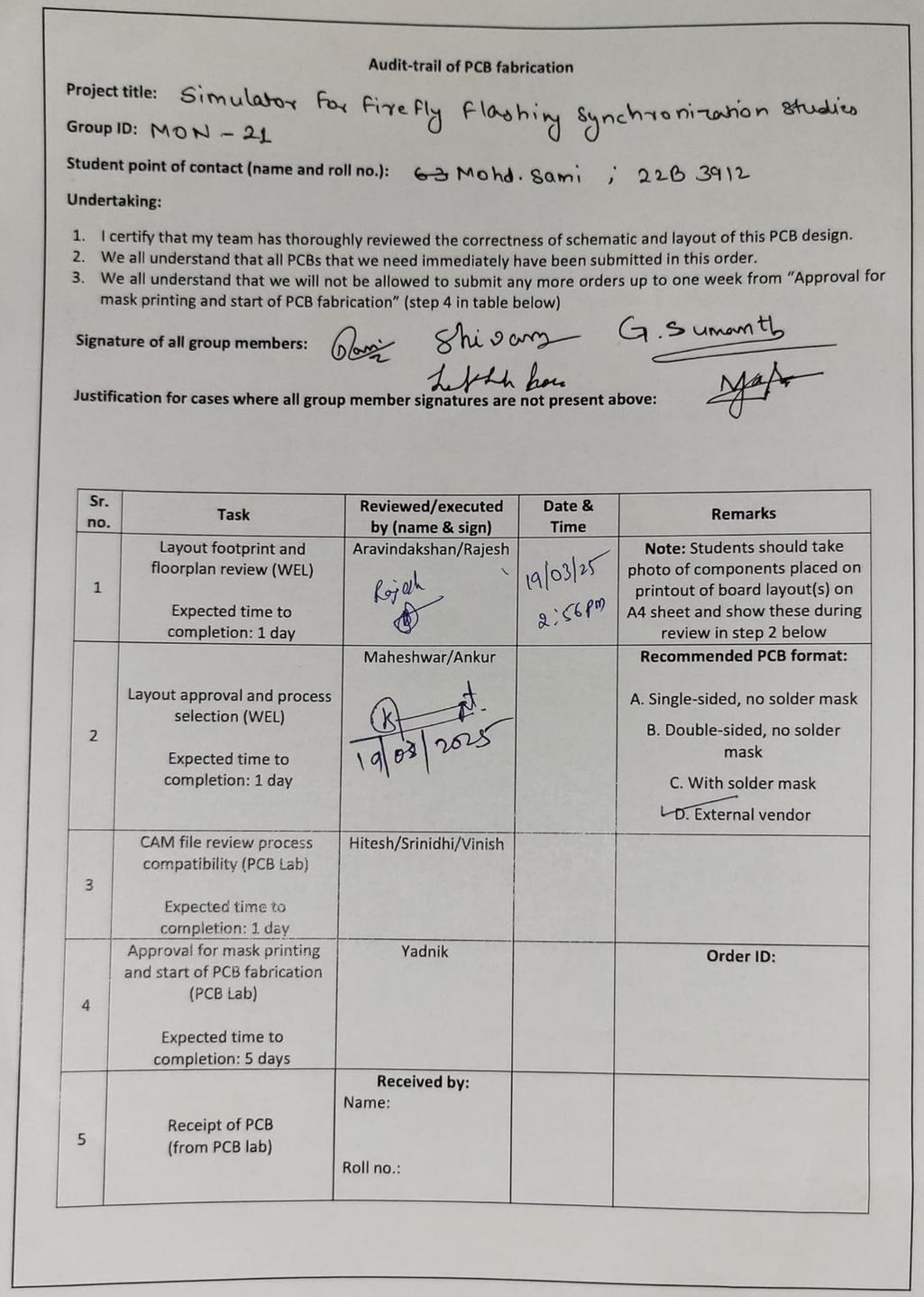
video link: https://drive.google.com/file/d/1-QQgroPthyP-19S8QJT4wVglCEQSemxp/view?usp=sharing

PCB review

In our project we have two different PCBs. One is the firefly board which will mimic the firefly behaviour and one is the baseboard on which all the small firefly boards will mount.

FireFly board - Completed, verified and given for fabrication

BaseBoard - Completed, verification and ordering is pending



Audit-trail of PCB fabrication

Project title: Simulator for Firefly Flashing Synchronization Studies

Group ID: MON – 21

Student point of contact (name and roll no.): Mohd. Sami ; 22B 3912

Undertaking:

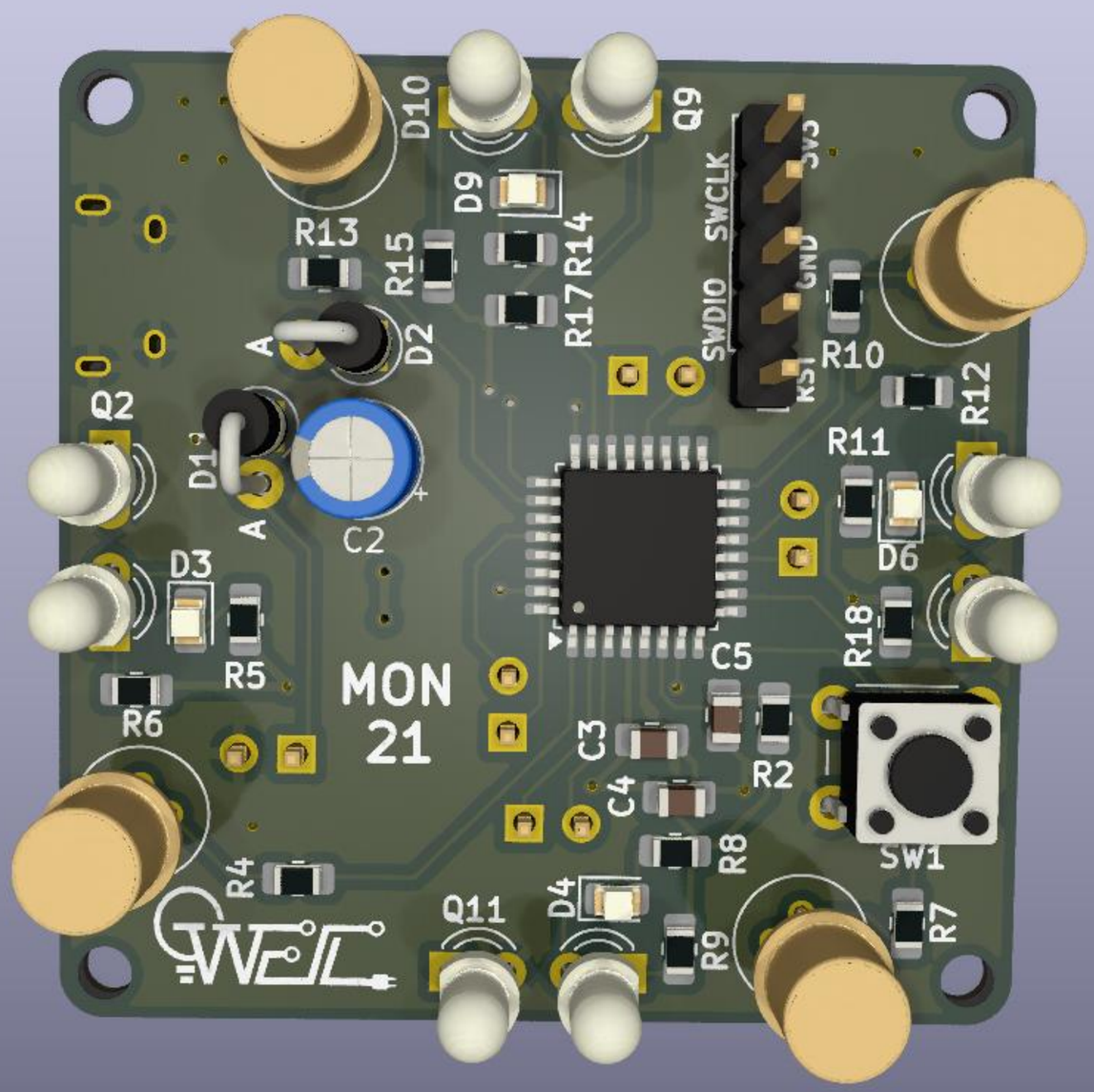
1. I certify that my team has thoroughly reviewed the correctness of schematic and layout of this PCB design.
2. We all understand that all PCBs that we need immediately have been submitted in this order.
3. We all understand that we will not be allowed to submit any more orders up to one week from "Approval for mask printing and start of PCB fabrication" (step 4 in table below)

Signature of all group members: Shivang G. Sumanth

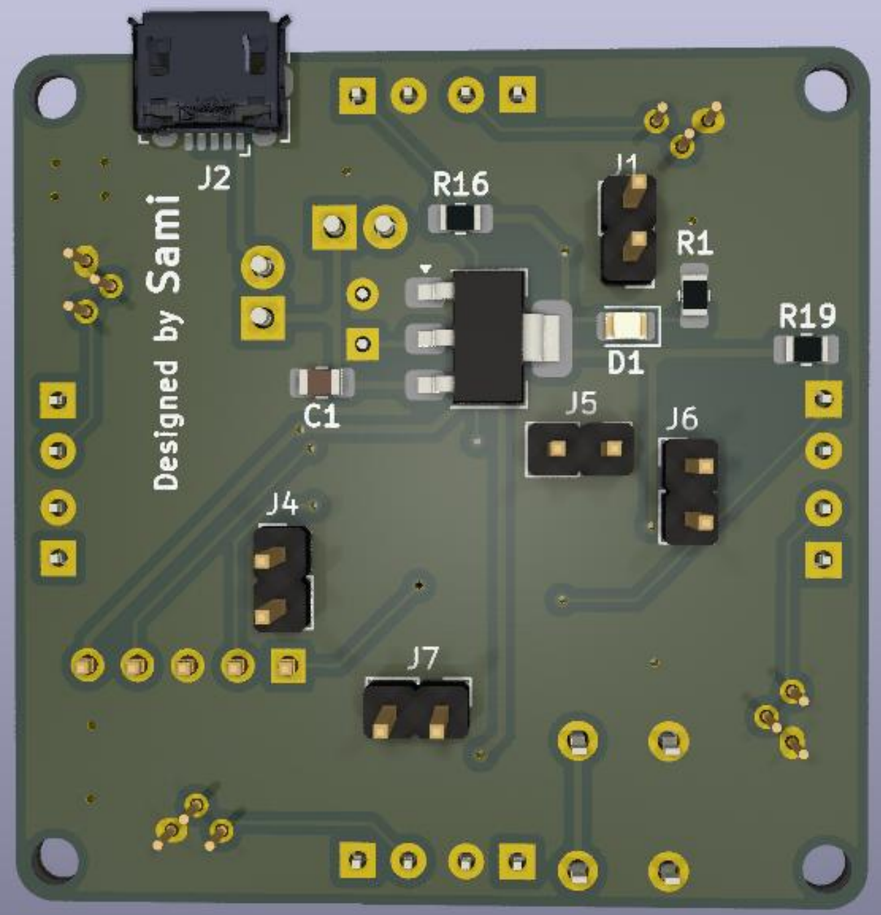
Justification for cases where all group member signatures are not present above:

Sr. no.	Task	Reviewed/executed by (name & sign)	Date & Time	Remarks
1	Layout footprint and floorplan review (WEL) Expected time to completion: 1 day	Aravindakshan/Rajesh Rajesh	19/03/25 2:56pm	**Note:** Students should take photo of components placed on printout of board layout(s) on A4 sheet and show these during review in step 2 below
2	Layout approval and process selection (WEL) Expected time to completion: 1 day	Maheshwar/Ankur 19/03/2025		**Recommended PCB format:** A. Single-sided, no solder mask B. Double-sided, no solder mask C. With solder mask ~~D.~~ External vendor
3	CAM file review process compatibility (PCB Lab) Expected time to completion: 1 day	Hitesh/Srinidhi/Vinish		
4	Approval for mask printing and start of PCB fabrication (PCB Lab) Expected time to completion: 5 days	Yadnik		**Order ID:**
5	Receipt of PCB (from PCB lab)	**Received by:** Name: Roll no.:		

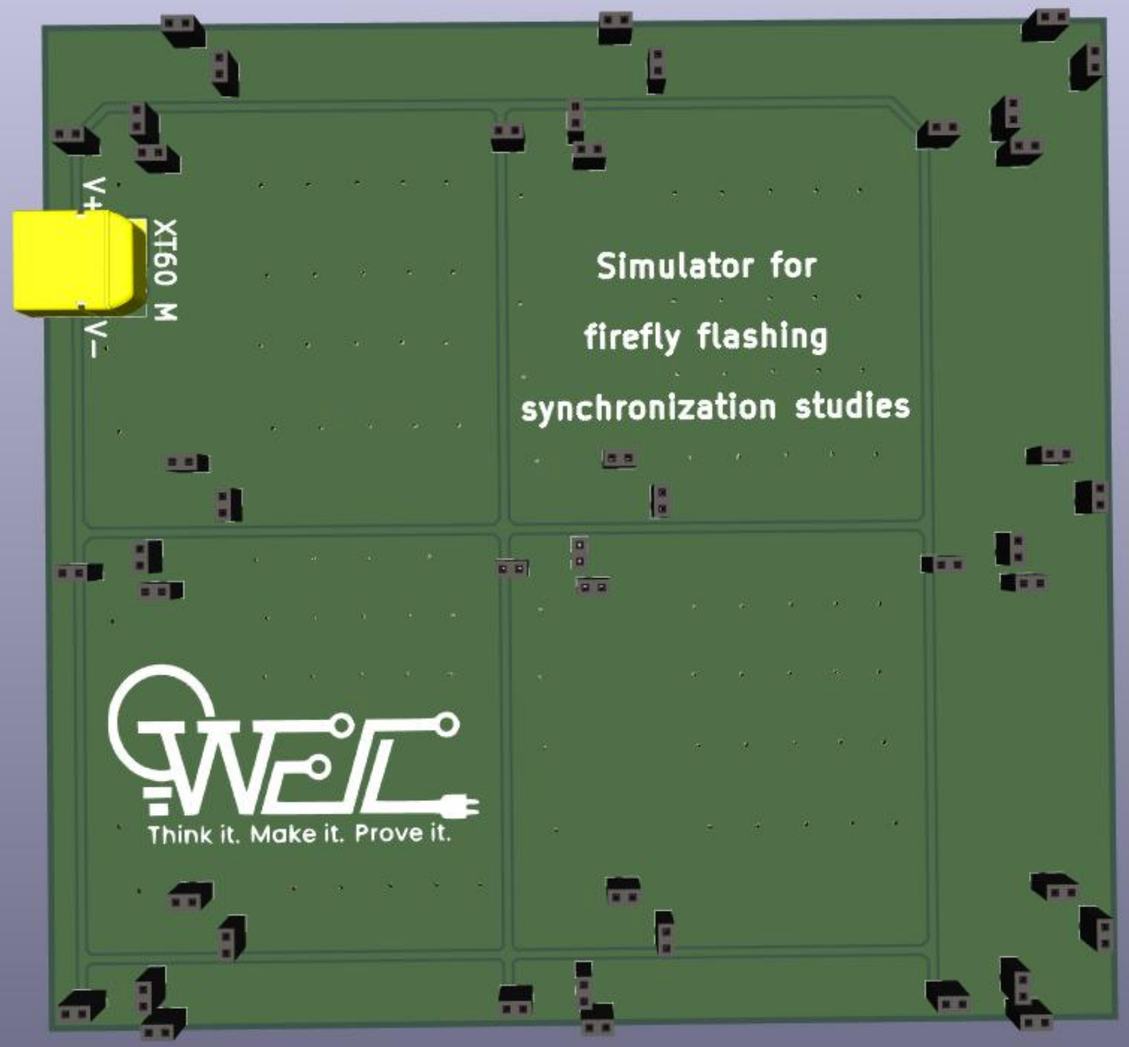
FireFly Board - Top view



FireFly Board - Bottom view



Base Board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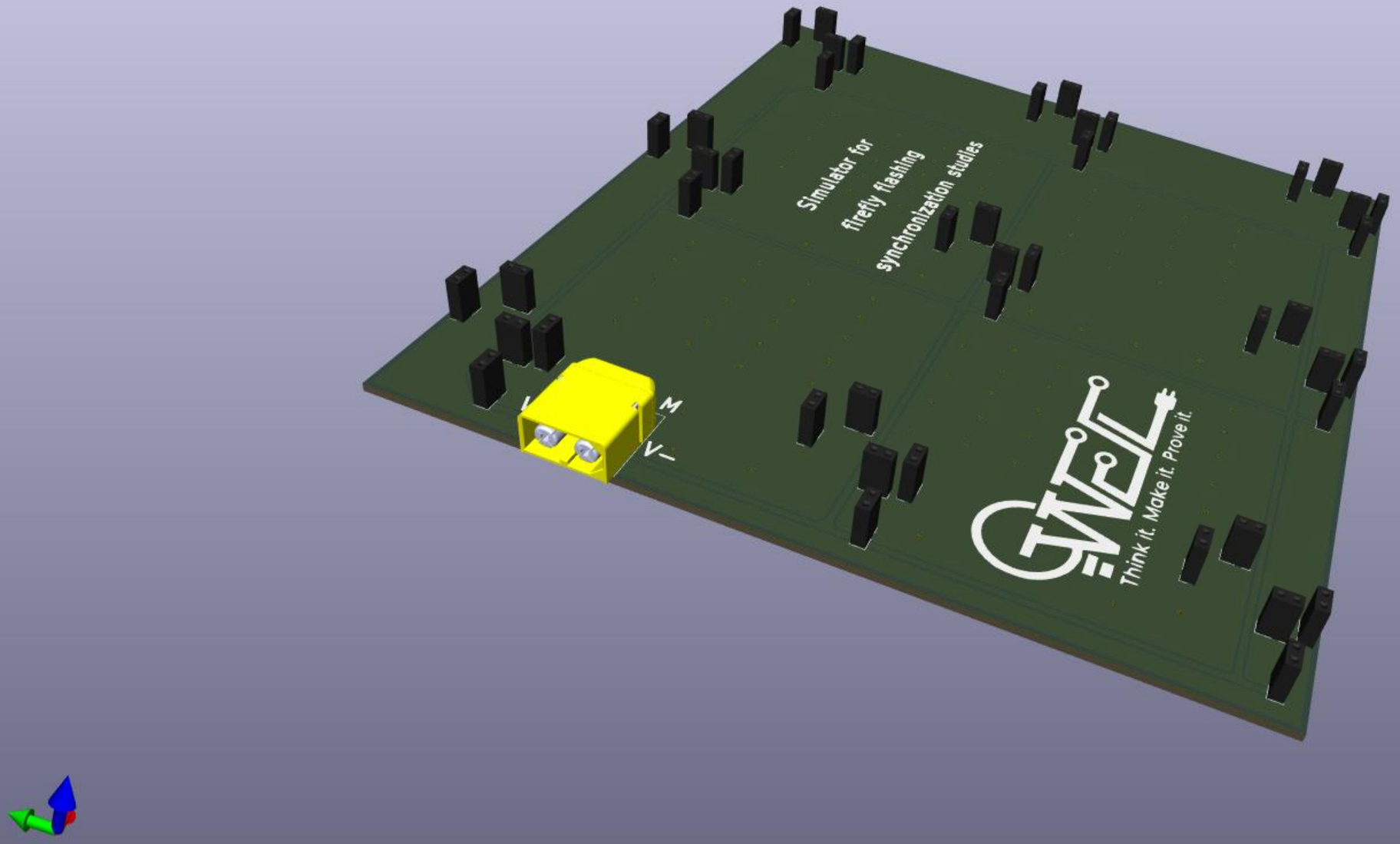
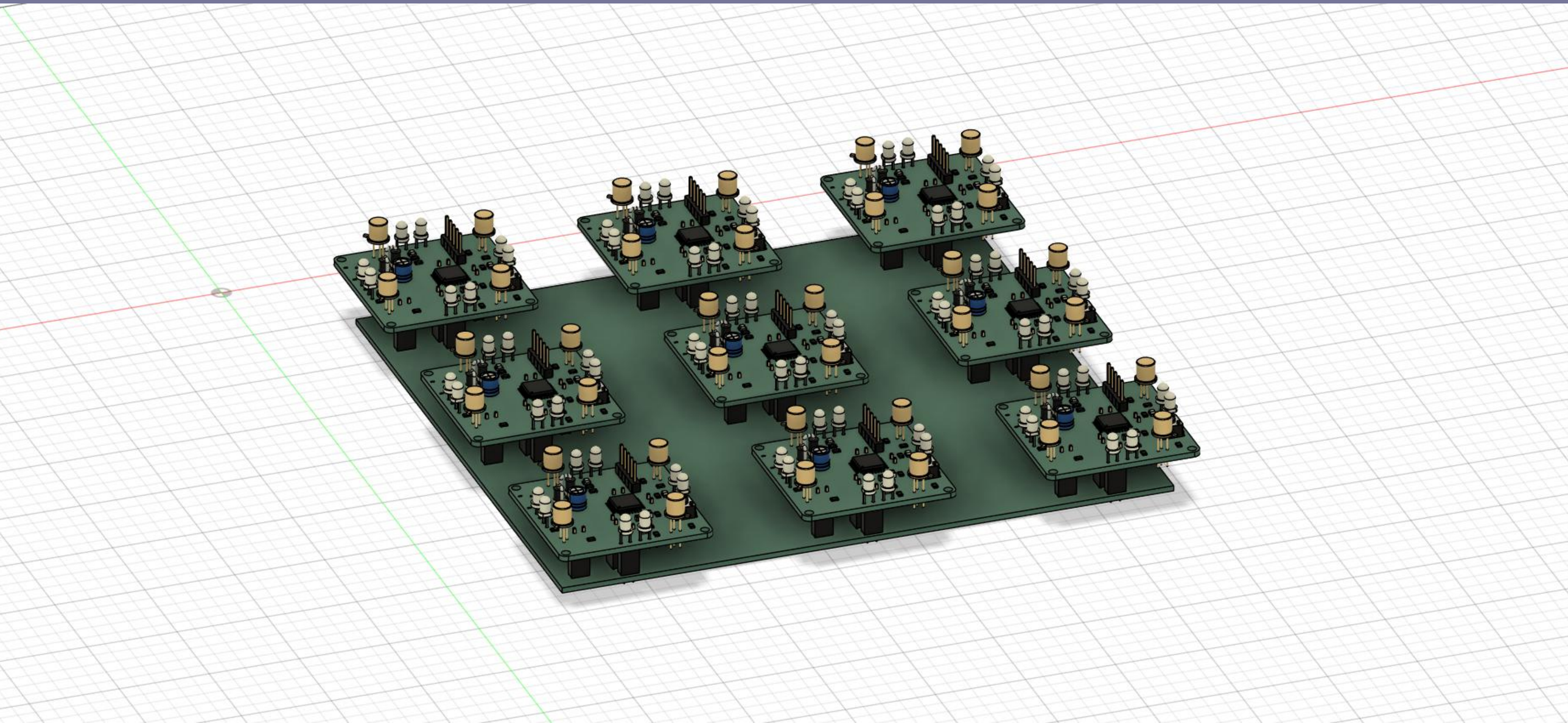
Simulator for
firefly flashing
synchronization studies
Think it. Make it. Prove it.


Simulator for
firefly flashing
synchronization studies
M
V
Think it. Make it. Prove it.

CAD Model - FireFly boards Assembled on BaseBoard



KEY LEARNINGS AND CHOICES

In terms of learnings i learned a lot about PCB designing, the routing process and the good practices to do while making PCB. like ground stiching, faraday shield, proper trace width etc.
Also mastered the software kicad in the process.

The choices of our components

STM32G030K8T6 - STM32G030 series was fixed by the porf. then we chose this model since it was sufficient for our use case and due to ease of soldering and availability.
IR LED and phototransistor pair - SFH 4550 SFH 309 FA. IR was used to avoid interference from visible and photodiode which had the max sensitivity at around 850nm (our ir led wavelength) and had a very small FOV.
Other components like transistor, LDO, micro USB connector were used which are available in WEL.

PROGRESS MADE AGAINST TEST PLAN (GANTT CHART)

Original plan

We were supposed to have completed the fabrication process. And should have started soldering the components.

Deviation

We are late by 1 week. PCB should have been given for fabrication 1 week earlier.

We have less time for soldering and trouble shooting.

WORK DISTRIBUTION

Mohammad Sami

- Circuit/schematic designing
- Components selection
- Circuit testing on breadboard
- PCB designing

Shivam

- Wrote STM logic for RC circuit implementation
- Approximated the optimal distance between LED and Photodiode.

Sumanth

- Configured the initial hardware setup, including GPIO and timers.
- Collaborated on troubleshooting unexpected bugs in the code.
- Tested power management and ensured efficient board operation.

Yashwanth & Lokesh

- Worked on understanding and finalising the algorithm needed to use
- Conducted a few experiments on the sensors

FINAL DEMO PLAN

We’ll recieve our PCB in the first week of april and by 5th April we plan to have completed the soldering.

Next Week we will do the testing, troubleshooting and test our code on the system.

By 12th April we’ll be done by our project and will be ready for the final demo.

Thank You