Instituto Superior Técnico

HackerSchool

Initial Sprint Report
Free Libre Open Source 3D Printer

Manuel Lisboa Soares, LEEC aka Nuclear Monk,
João Barreiros C. Rodrigues, LEEC aka Ex-Machina,
Nuno G. T. Abreu, LEEC aka WoneBone,

March 2022

Contents

1 Introduction and Motivation

We have found ourselves unsatisfied with the current state of the HackerSchool 3D Printer.

A self-titled hacker/maker group cannot settle for the bare minimum, barely working, and proprietary.

As such we set ourselves on frankensteinifying the parts of the backlogged Hello Bee Prusa into a FLOS 3D Printer so that HS can be proud of the materials they own and produce. This shall also insure better work quality form the whole nucleus in the future. The FLOS 3D Printer team also stands to promote 3D printing best practices which have been somewhat neglected.

2 Theoretical references for the Project

Hello Bee Prusa Assembly Manual
Hello Bee Prusa .stl repository

3 Project specifics

3.1 Project insertion on the Hacker subject

The project focuses on three main Hacking Schools:

3D Modeling and printing: A considerable part of the printer design and upgrades are based on 3D printed, PLA parts, that have either been deformed or completly broken due to heat, faulty printing or mechanical forces and meed to be replaced. Upgrading the printer also requires such mods.

Hardware hacking:The power supply controller and connector has been lost. In order to reuse it reverse engineering, hardware hacking and hardware upgrading will be required.

Programming:In order to control the printer efficiently a compatible Marlin version has to be flashed. Marlin can also be moded and adapted through C/C++ scripting.

3.2 Task planning and management

3.3 Task planning, partial and total ETC

Task #	Task Description	Main appointed maker(s)	Task Dependencies	Specific needed materials	ETC	% of completion to date
0	Inventory the printer's corpse, take note of missing pieces	Full Team	N/A	N/A	1 day	100 %
1	**Simple electrical repairs**: x-motor junction and re-do isolation	João and Nuno	0	Soldering Kit	2-3 days	30%
2	Model broken 3D Pieces	Manuel and Nuno	1	1-2 weeks	None	0 %
3	Print 3D pieces	Manuel	2	1 week	PLA, working 3D printer	0%

4	**Simple Mechanical repairs**: Replace squared bearings, clean and re-lube axis	Full Team	0	Bearings, WD-40	1 day	0%
5	Assemble Printer (test phase)	Full team	All of the above	N/A	1-4 days	0%
6	Flash Marlin firmware into Keyes board (test phase)	Full Team	0	None	1 day	0 %
7	**Advanced electrical repairs**: Repair Power Supply module, possible Keyes board repairs	João and Nuno	1, 7	Soldering kit, other specific electrical components	1-3 weeks	0 %
8*	Mod Marlin firmware, flash moded Marlin	João and Manuel	7, 6	N/A	1-3 weeks	0%
9*	Re-Assemble Printer	Full team	All of the above	N/A	1-4 days	0%

10*	Rig Octoprint enviroment and setup	Full team	All of the above	Camera	1 week	0%

**- The tasks 8, 9 and 10 will be continued in maintence phase in order to allow Printer upgrades and optimization*

Total ETC: Around one semester

3.3.1 Materials

Material Description	In Storage? / Available	Cost	References
Soldering Kit	Yes	N/A	N/A
General mechanical components(screws, bearings, lube)	N/A	N/A	N/A
Printer PLA	Yes	N/A	N/A

Other materials will be request along the project, acording to board and power supply specifications.