

R.D.C.S (Robotic Duster Control Sys)

Dooley Lance, Devlin Craft



The background of the slide is a green circuit board with various electronic components and traces. On the left side, there is a vertical strip showing a resistor, a capacitor, and a component labeled '509 B'. The rest of the background is a solid green color with faint, repeating patterns of circuit components and labels like 'R518', 'D50A', 'C502', and 'X50'.

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Project Background

Dust doesn't fair well onboard an orbiting space station. Dust can be disastrous on a space station due to many problems it can cause. Dust can get into electronics such as control panels dust can also contaminate lab experiments and cause error in critical data.

Astronauts can't clean all the time and run the space station at the same time. Our solution is to make a microgravity roomba like robot that can autonomously dust the whole space station and dispose of it appropriately.

The Mechanical and Hardware of any robot is useless unless you can control it. This is where R.D.C.S steps in, R.D.C.S is the acronym for robotic duster control systems. R.D.C.S is the software and hardware that powers the robot and makes everything run. Without R.D.C.S the robot wouldn't be able to know what to do or how to move.

In essentials R.D.C.S is the brains and conscience of the robotic duster.

The background of the slide is a green circuit board. On the left side, there is a vertical strip showing a resistor with a zigzag symbol, a solder joint, and a component labeled '509 B'. The rest of the background is a solid green color with faint, light-green circuit traces and component labels like 'R522', 'C520', 'C502', and 'X50' visible.

Design Criteria

Must be able to control multiple arms and motors. Must be able to expand to full autonomy. Must be light and portable. Each Arm needs an individual smaller microcontroller to act as a small brain.

Project Research & Development

Researched how to run motors using a raspberry pi. Researched processing powers needed to run ai automation algorithms.

python 3.8

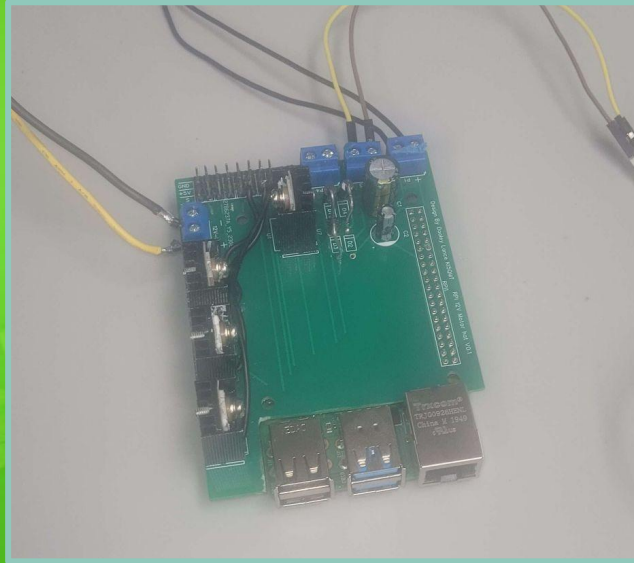


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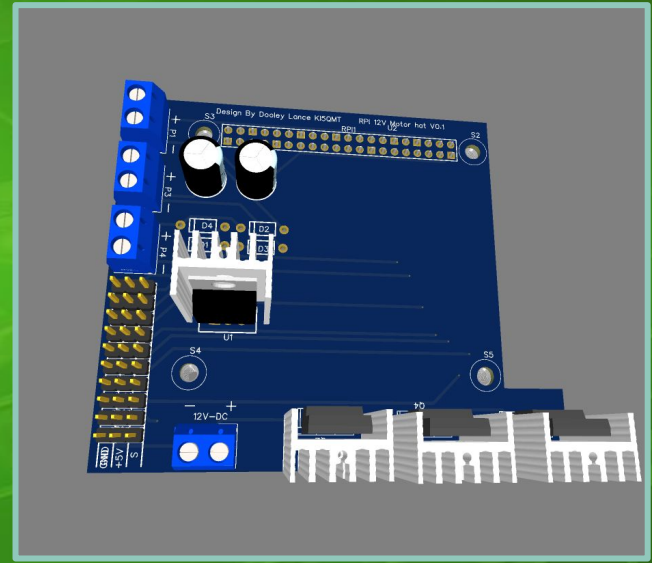
Prototypes

2 Circuit board designs

V1:



V2:





Future Plans

- Design more modules that can be integrated to serve more than one purpose since you have to be resourceful with what you have on board in space.
- Help by testing in robotics communities online that work with the source code to check for problems.

Circuit Schematics

