Carnegie Mellon University

16-681

MRSD Project I

Task 11 Power System Design
Team C - COBORG

Husam Wadi, Feng Xiang, Jonathan Lord-Fonda, Yuqing Qin,
Gerry D'Ascoli

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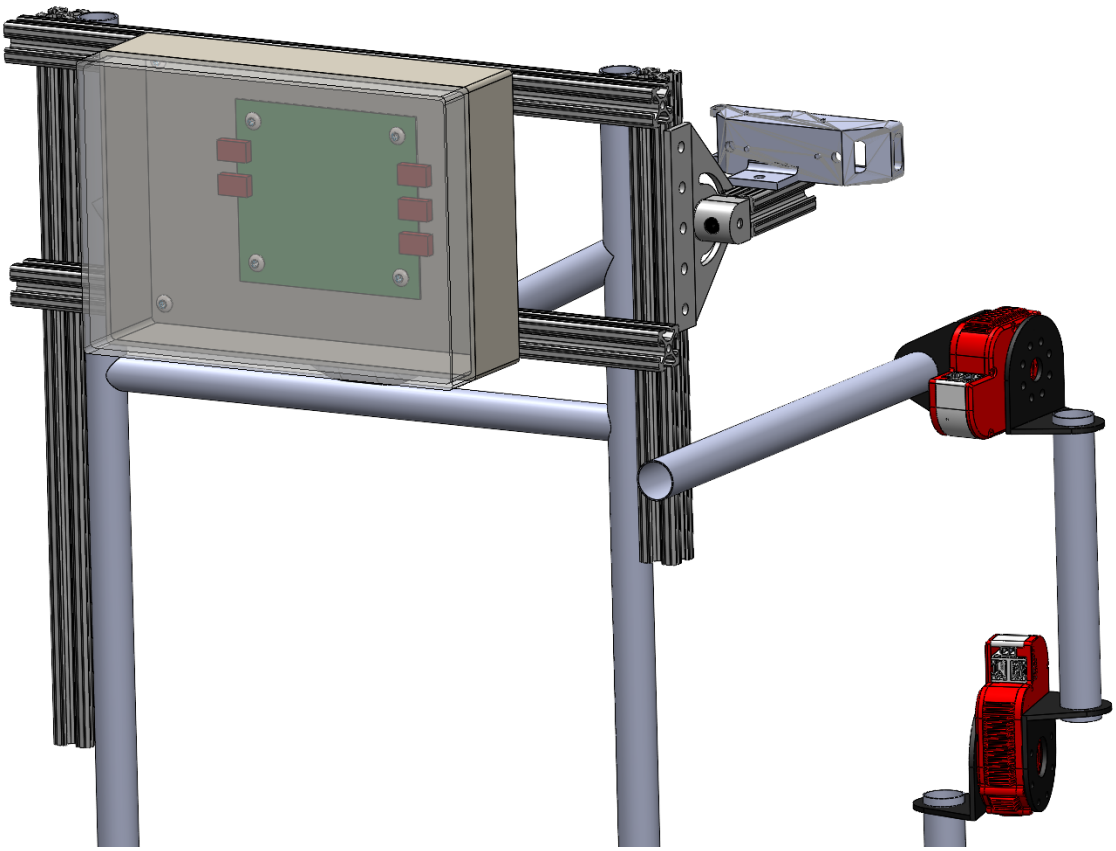
1. PCB

1.1. PCB Mounting Strategy

The Coborg platform is a backpack robot that assists aircraft and automotive factory workers with their production tasks. To achieve this goal, the robot we design must be mobile (untethered), power a robot arm (motors), and power a main compute unit. It would also be beneficial to have a method to switch between tethered, charging, and untethered to allow greater flexibility with the platform.

Our goal is to create a power distribution platform that can sense what the power source of the robot is (tethered to the wall, or battery powered) and select the best source, with a bias towards tethered power. This means if both the battery and a power cable is plugged into the robot, it will choose to source power from the cable.

Figure 1 - Enclosure with PCB

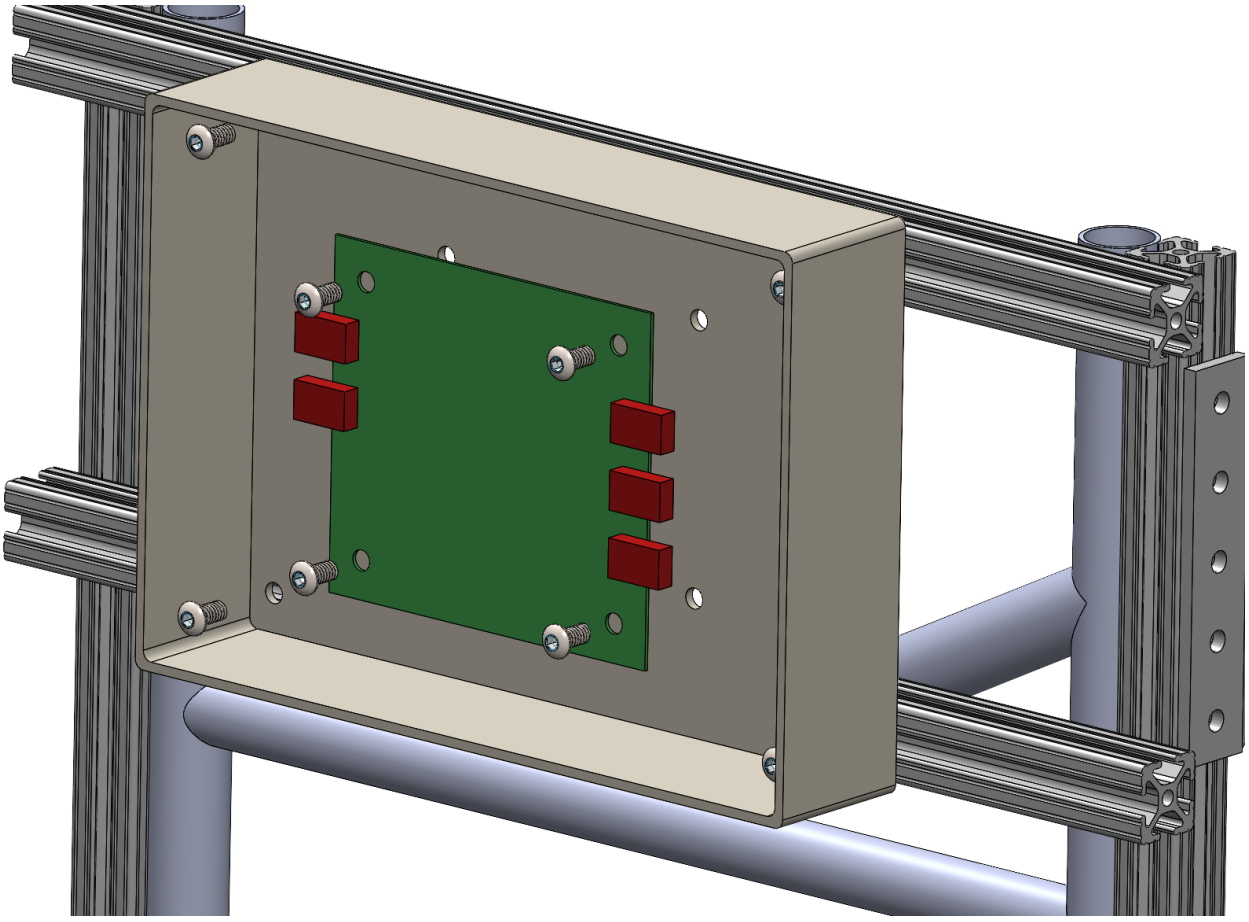


This figure illustrates where the PCB board will be relative to the rest of our robot. It will be secured in an electrical enclosure by a set of screws on the back of the robotic backpack.

1.2. Cabling

C) As seen in Figures 1 and 2, our PCB will be mounted inside of our electrical enclosure with 4, 1/4-20 screws, one in each corner. The enclosure itself is mounted to the robot frame with 4, 1/4-20 screws and 4 nuts. The PCB will interface with the various external electrical components through Anderson connectors, which will be both on the PCB board and on the internal surface of the enclosure itself. The cables will run to the right and left off the PCB board. The Anderson connections on the outside of the enclosure will have soft strain reliefs to prevent pull damage.

Figure 2 - PCB Exploded View



This figure demonstrates an exploded view of the PCB board, illustrating how the PCB board will be attached to the enclosure.