Task 12, Milestone 3
Architecture Description

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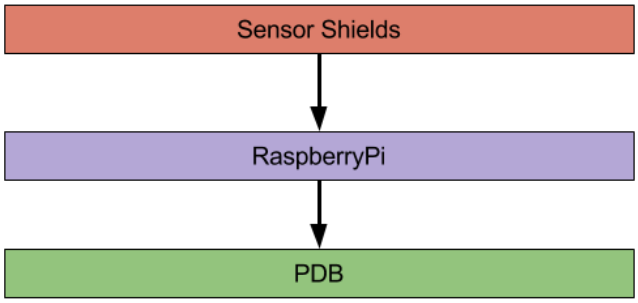
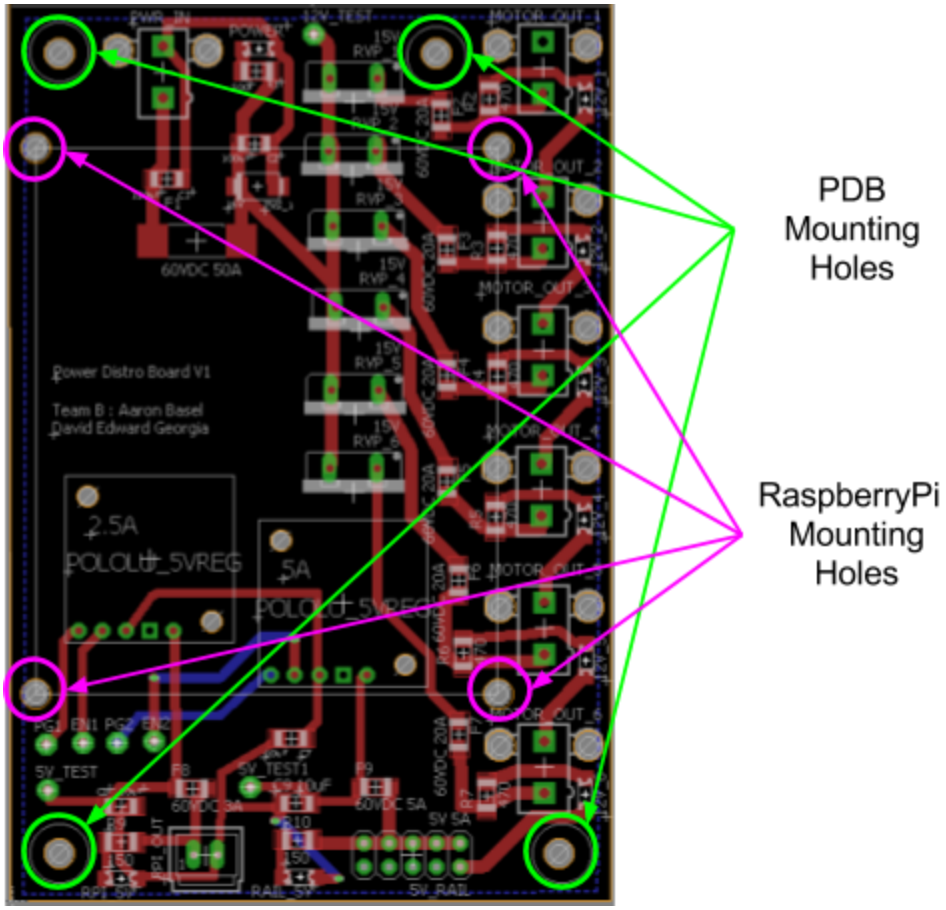
Overall Architecture

Due to the a revision of what actuators we intend to use, our power supply has changed from 24V to 12V. In order to keep our system modular as we develop our hardware, our board includes six 12V power outs, three of which are not yet used by our current system, and some of which could be fed into a step-up board we designed for stepper motors. We also included a 5V, 5A rail, so we can add peripherals as needed and our Raspberry Pi power supply. All of these outputs are individually fused, regulated, and protected (for the 5V outputs, reverse voltage protection and regulation are performed on a Pololu breakout board). The Raspberry Pi will be mounted to our PDB via nylon standoffs. We intend to make or use sensor shields to mount on the Raspberry Pi in the near future. This will maintain the modularity of our system and allow us to iterate on our sensors and circuitry.



The Power Board

Our power distribution board has two sets of mounting features: 4 holes for mounting on the chassis of our platform, and 4 for mounting the Raspberry Pi via standoffs. Most of the cable management will be performed on the chassis, but some consideration was put into placing connectors that will be going to similar systems in the same direction. For example, all of the 12V out connectors will be going to the sensor actuation system, and most of the 5V out will be going to localization.



Wheel Encoders

Given the amount of space leftover on our allotted board size, we decided to include on the PCB our two magnetic wheel encoder PCBs. These have four mounting points which will be used to connect these to our wheel hub. The magnet the encoder uses for measuring rotation will be mounted to the wheel. All of the cables from this PCB will be guided through the wheel hub.