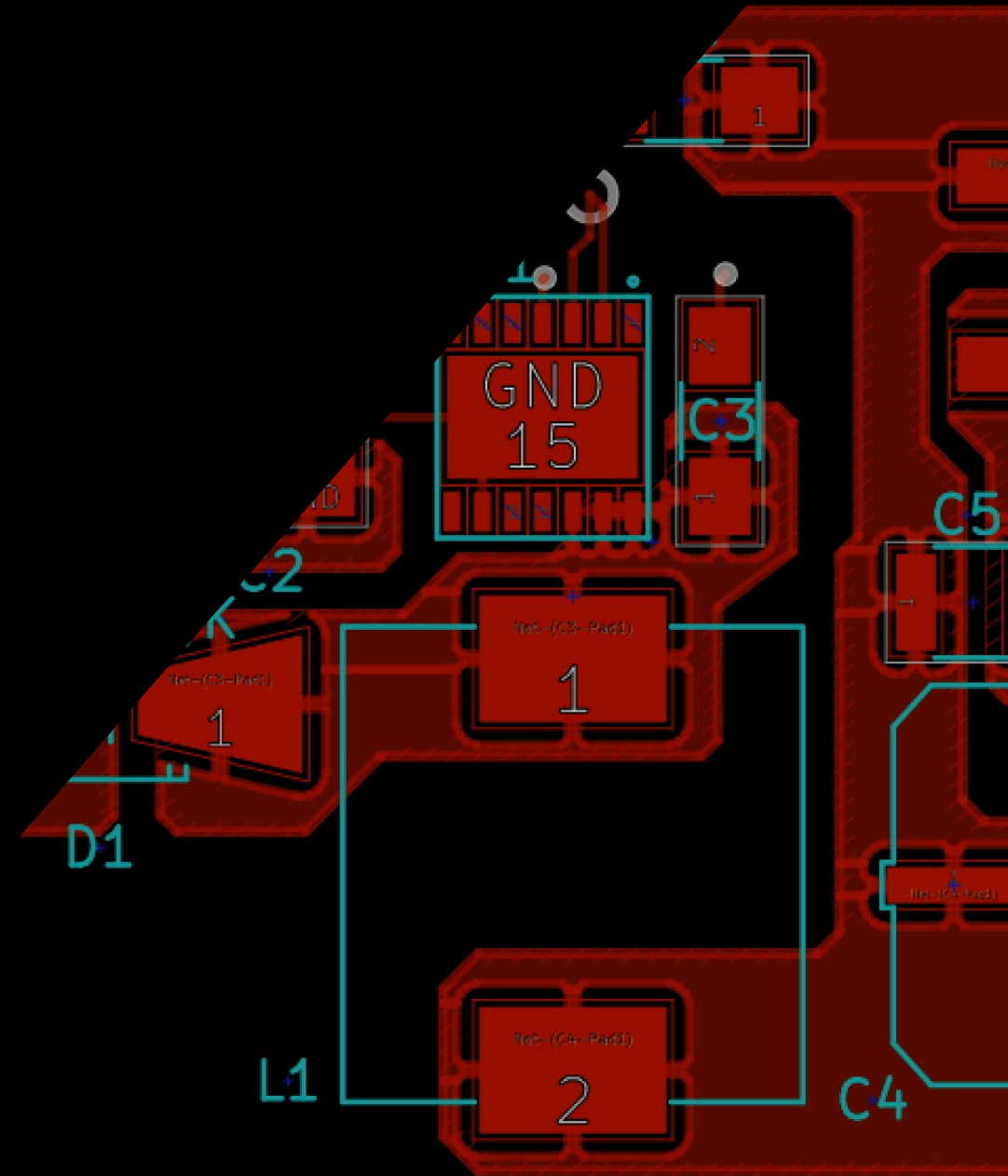


ELECTRICAL POWER (BATTERY TASK)

SMART METHODS

SUMMER INTERNSHIP 2021

SHATHA ALFAYEZ



This task required to investigate and choose the suitable kind of batteries to power a DC Motor in the robot. The battery with the highest capacity, that can output hundreds of amps easily for long periods of time, and the lowest cost was the preferred one.

After analyzing all the different kinds of batteries being used to power the motors in the robots, I concluded that we should use one of the following types of batteries:

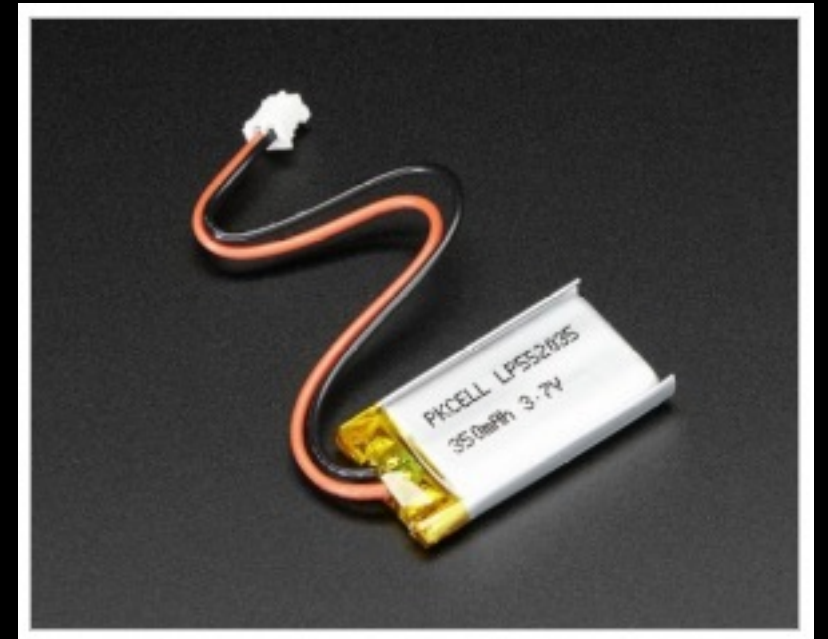
1. NICKEL-METAL HYDRIDE BATTERIES (NI-MH)

- The most preferred choice
- Decent capacitance
- Low-cost compared to their size
- Safe to use in comparison to NICAD batteries.
- The voltage rating of each cell is 1.2 V that comes with range from 600 mAh to 3300 mAh.



2. LITHIUM POLYMER BATTERIES

- The most popular type of batteries for use in robotics
- Lightweight
- High discharge rates
- Relatively good capacity, except the voltage ratings are available in increments of 3.7 V.
- Dangerous to use and need to be handled carefully. So, it best to begin with NIMH batteries first.



3. LEAD-ACID/SLA BATTERIES

- The cheapest option for high capacity.
- Require almost no maintenance for several years and can undergo a thousand of charge and discharge cycles
- Heavy for mobile robots
- The best choice for a large robotic project that requires lots of amps.
- Each cell has a 2V potential. The most common cell configuration is 6 Cells, or 12V.



- These choices are determined based on the voltage rating of the DC Motor with the voltage range 6V – 12V.
- Other specifications of the DC Motor should also be known, for example, the Free Current or No-Load Current, Stall Current, Power and Torque.

NI-MH BATTERY CHARGER CIRCUIT

