Rover to Sense, Lift, and Transport Magnetic Blocks

Overview
We were required to design a rover that would weigh less than 2 lbs, and would be able to sense magnetic blocks, lift them, and transport them. Our team worked with a quadcopter team. The quadcopter lifted us from the launch site and transported us to the area where the blocks were laid out in a maze.

Objectives
- Create a rover that can sense, lift, and transport magnetic blocks.
- Keep the rover under 2 lbs.
- Make sure that the rover does not tip and the components used do not fail during operation.
- Make sure that the rover does not fall from the quadcopter during flight.

Approach
- We decided not to use the given prototype rover model to minimize weight.
- We decided to fabricate our own custom-made rover to reduce weight and maximize modifications.
- We did concept generation and selection matrices, as well as decision matrices and benchmarking.
- We reviewed relevant patents.
- We created SolidWorks models of the rover.
- We performed intensive testing before the final competition.
- We performed stress, strain, and strength calculations, center of gravity and gripping force calculations.
- We had weekly meetings with the customer to ensure we were fulfilling customer requirements.

Outcomes
- All the project requirements were fulfilled.
- The rover was able to accurately sense, lift, and transport blocks into the quadcopter.
- The project entailed the devising of innovative ways to reduce weight.
- The sponsor will certainly save a lot of money by reducing weight on air vehicles by following our strategy.