SENIOR DESIGN ORGANIZATION SYNOPSIS-FALL 2013

NASA ROBOTIC MINING ROVER

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Space Exploration is an international objective that joins the greatest minds in the world, in both the science and engineering fields of work. One of the ways organizations such as NASA searches for innovative ideas and people is through competitions such as the Robotic Mining Competition. The M.E.C. Panthers is a multi-disciplinary joint effort between mechanical, electrical and computer engineers to compete in the competition. Each discipline specializes in different components of the rover; therefore, the final design will be the integration of these components into one system.

The objective of M.E.C Panthers is to use the multidisciplinary knowledge to design and build a rover that will be able perform to NASA standards and show innovative approaches to a given problem. Unlike usual designs, this design will be based on a track driving system to navigate challenging terrain. Due to potential reliability issues, most teams decide to use the conventional wheel drive system, but the M.E.C. Panthers are determined to prove that these issues can be resolved and that the track drive system is the superior mobility system. The collection mechanism is another component that will stand out. Mechanisms involving scoops have been used, however, the M.E.C. Panthers will implement a bucket elevator system where the buckets are connected and move together like a conveyer belt rather than scoops being connected to a conventional conveyer belt. In doing so, the goal is for the lunar rover to collect regolith at a high rate while minimizing weight.

The collection and mobility system along with the building of a lightweight frame is the responsibility of the mechanical members. The computer engineers are responsible for the programming that will instruct the rover what it must do. The programming will also include autonomous functioning of the rover. Finally the electrical engineers must create the communication lines between the computers and the components so that the rover can function. Ultimately the integration of the three disciplines will determine the success of the team's objectives.