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Florida Tech Robotic Mining Team

S. Alshebl

Florida Institute of Technology

D. Alajai

Florida Institute of Technology

N. Cunha

Florida Institute of Technology

M. Brio

Florida Institute of Technology

B. Dilindi

Florida Institute of Technology

See next page for additional authors

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Authors

S. Alshebl, D. Alajai, N. Cunha, M. Brio, B. Dilindi, R. Ha, D. Frutchey, J. Hernandez, E. Kames, M. Kruger, C. Marley, S. Lai, A. Neiger, Y. Lu, L. Ni, K. Rieder, P. On, M. Yang, C. Perry, Q. Zhang, J. Roger, and J. Stevens

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Faculty Advisors: Dr. Reichard, Dr. Kaplinger, Dept of MAE, Florida Institute of Technology

Introduction

Florida Tech Robotic Mining team is a multidisciplinary group that aims to design and build a multirobot system to compete in the 2015 NASA Robotics Mining Competition.

Objectives

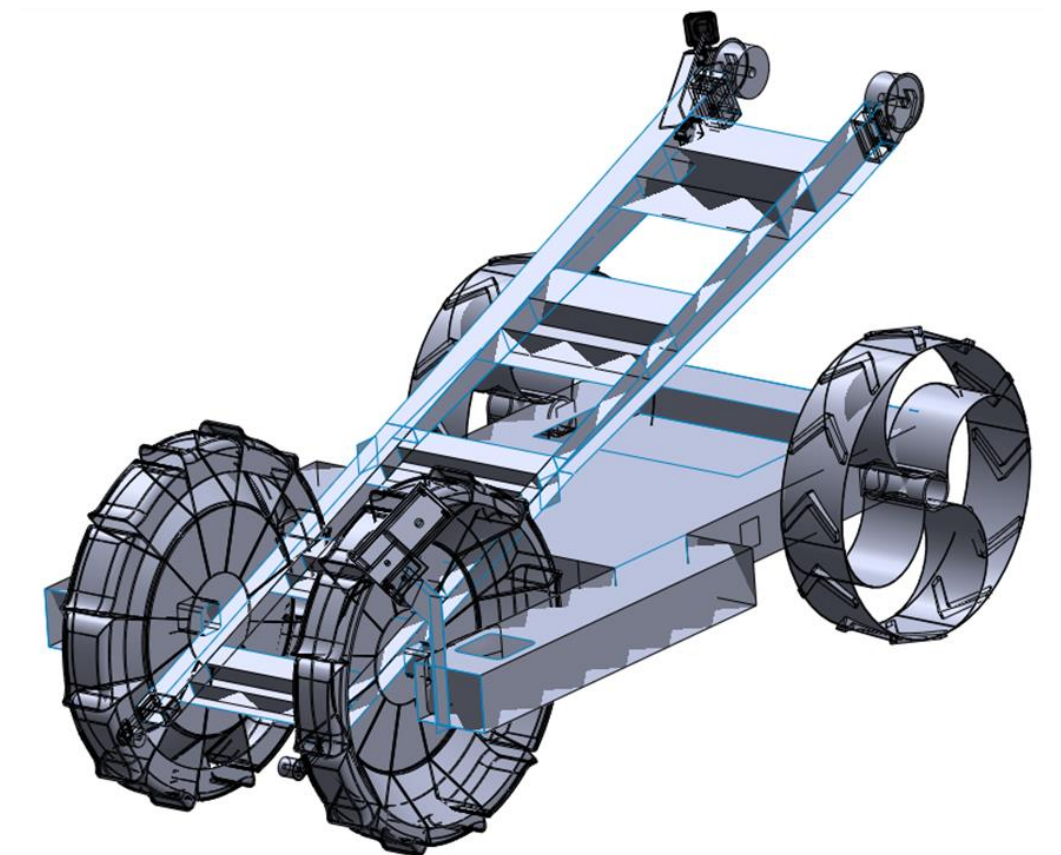
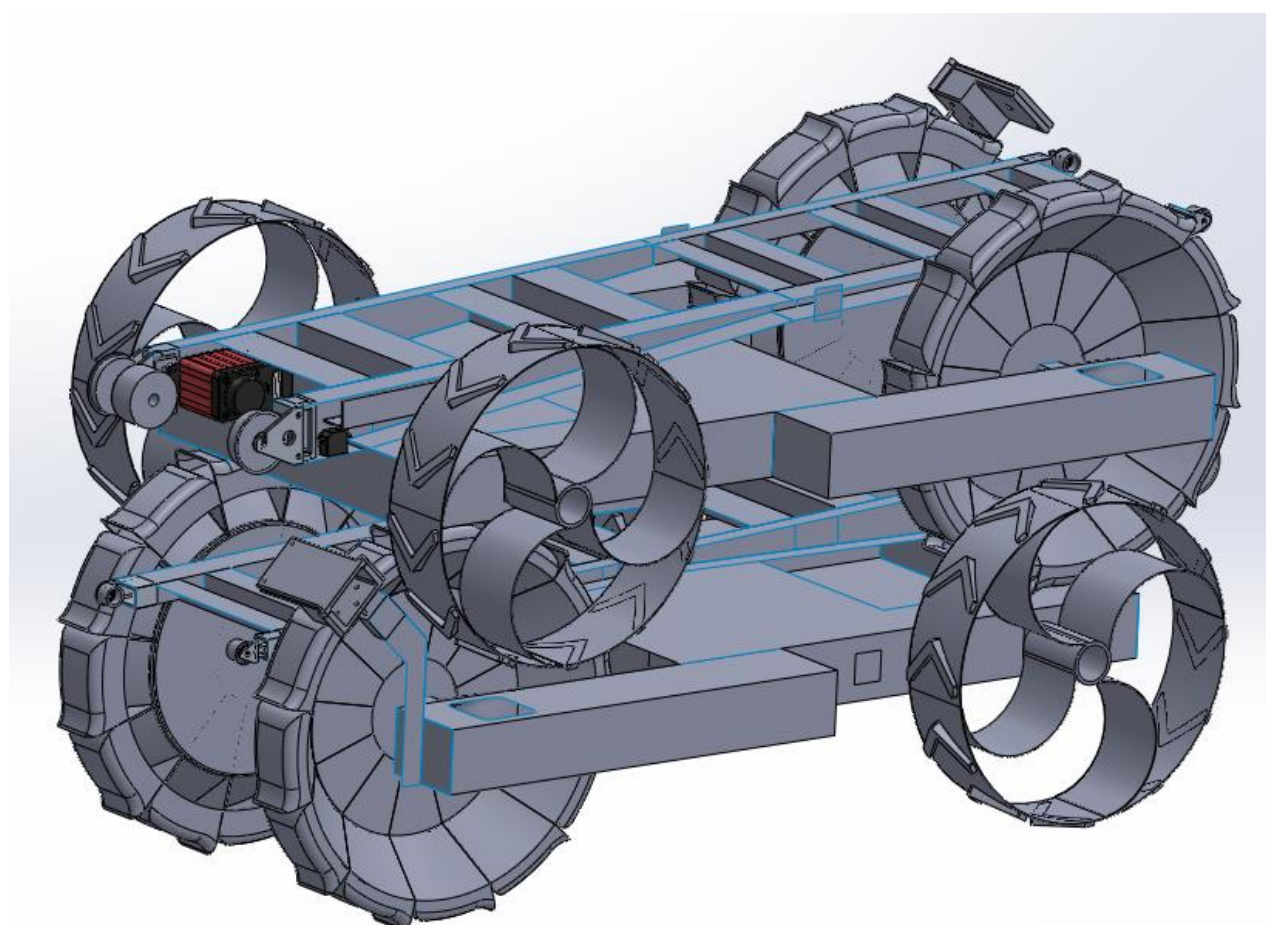
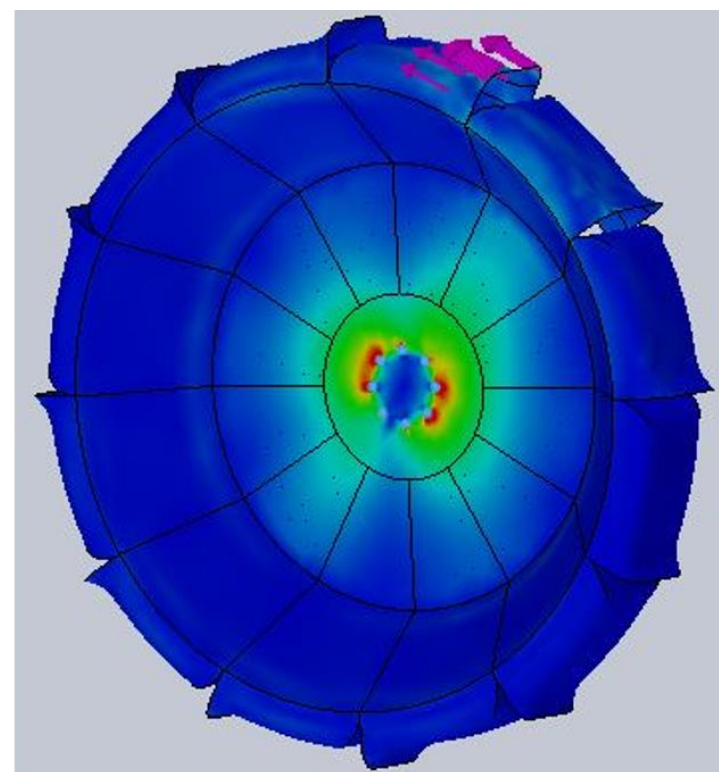
To create a new and innovative way to excavate on extraterrestrial surfaces. The goal is to have each robot come under 25kg, be contained within 1.5x0.75x0.75m, fully autonomous with the ability to be controlled remotely, and be able to mine and deposit 200kg in 10 minutes. This will allow us to qualify, compete, and win at the 2015 NASA RMC.

Design

Designed almost entirely out of carbon fiber to increase strength and reduce weight. Innovative wheels which acts as the maneuvering and excavating systems. A laser range finder is used to detect obstacles while a camera and computer vision is used to autonomously determine the position of the robot.

Analysis

Each component of the robot went through vigorous FEA simulations to create the best geometry and efficiently model the parts. A factor of safety of 2.5 is used to make sure the parts will withstand the goal load while having minimum weight.



Specification

Power:

2 Powerized Polymer Li-Ion Batteries

Approximate Weight:

20 kg per robot

Size:

1.5x0.75x0.75m

Payload :

200kg per bot per run

MAX Speed:

2.7 feet

Sponsors:

Florida Space Grant Consortium

MISUMI

SOLIDWORKS

Structural Composites, Inc.

NORTHROP GRUMMAN



Engineering & Science
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