

Modeling, Simulation and Optimization of Autonomous Vehicles on Mars

Task

In this Software Lab project, you will explore various design challenges for robotic systems on Mars. Starting with an existing model of the Mars Perseverance Rover, you will use simulations [3] to improve the design of some of the following systems:

- Electrical power system
- Drive system
- Steering system
- Robotic arm
- Path and trajectory planning

Project Characteristics

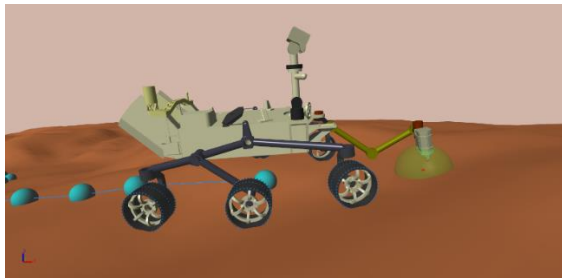
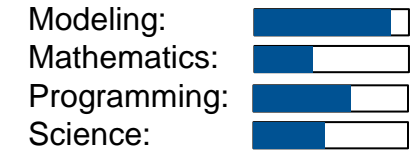


Fig 1 Simscape rover model with terrain [2]

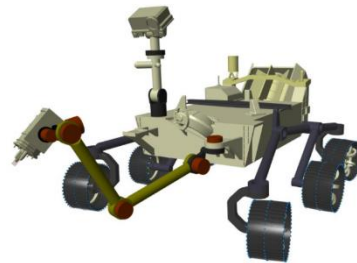


Fig 2 Simscape rover model [2]



Fig. 3 M2020 Model Rover – NASA [1]

[1] NASA, <https://nasa3d.arc.nasa.gov/detail/M2020-Model-Rover-STLs512020>

[2] The MathWorks, "Model and simulate multidomain physical systems," 2021. [Online]. Available: <https://www.mathworks.com/products/simscape.html>.

[3] The MathWorks, "Mars Rover Model in Simscape" 2022. Available: <https://www.mathworks.com/matlabcentral/fileexchange/105700-mars-rover-model-in-simscape>

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