Rover Project Report
Department: Computer Science

Image Processing

Computer vision is the phenomena by which the computer sense the real world objects and convert that into computer readable form.

Image Processing is the branch of Computer Vision which helps us to edit various images and perform number of operation on them to change the look of the image. There are many ways of image processing of which we are focusing only on the object detection and obtaining the characteristics of the object (for ex: dimension, shape, age, moisture etc..).

Here, the Rover will be able to detect the object given as input to it and read its characteristics. When the rover will come across the object given as input it will throw some color in the screen and we will be able to know that the object have been detected. The algorithm for this operarion will be devised using a built-in library OpenCV(Open Computer Vision) version 3.2-4.0 and will be implemented in C++.

GPS Navigation

GPS(Global Positioning System) is a satellite based navigation system which allows the ground users to determine the exact location, velocity, time (24 hours a day), in all weather conditions, all over the world. GPS basically follows NMEA data format much like ASCII is the standard for the digital characters in the computer world.

In this Project, we will be able to encode the given data about the location into GPS format. With the help of this GPS data , the rover will be able to locate the position of the decoded by the data and simultaneously traverse to that loaction. There will be certain range where the server will control the rover and give necessary direction to the rover as recorded from the GPS data and after that it will be all the Rover's work to navigate .

The GPS algorithm will be devised using the concept of NMEA standard and will be implemented in C++.

Dynamic Simulation Of Planetary Rovers

Simulation of planetary rovers moving on complex terrains is critical for Mars exploration. Equivalent stiffness is proposed and used to characterize the pressure-sinkage property of the terrain, while friction angle to characterize the shearing property. Terramechanics model for calculating forces between rigid wheel and soil is proved to be the same with that contact model for calculating forces between rigid wheel and rock. With the help of the above mentioned operations the rover will be able to detect the obstacle and it's characteristics by which we will be able to get the dataset of the most accurate path for the rover to follow.

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