Detection of Lunar Images:

Feild of the invention:

The invention belongs to the Machine Learning techniques.Basically we use an AI model to detect craters and boulders of all shapes and sizes from the given OHRC data.Convolutional Neural Network is used over here to recognise the patterns in images.As CNN is type of Artificial Neural Network used majorly to recognise patterns in images.Hence CNN is a powerful tool that needs millions of data points for training.It is useful in detecting the images and classify the images based upon the patterns with the Orbital High Resolution Camera.Since every images having patterns can now get detected easily.

Background of the invention:

The YOLOV7(You only look once)model is used for detection of craters and boulers.Then we used OHRC model to feature the craters and boulders but we faced some challenges that there were no real time detection. Real time detection defines about the situation where space craft captures the images instantly since where the rover is operating.AI processes them in milliseconds.This computing the images at milliseconds saves the time and helps in detection of images.But real time detection id restrained.Using of post mission analysis is used for the same. Although it lacks in decesion making.As instant decesion making is required by using the rover (satalletite) but after the capturing the images it could not adjust itself to perform the next operation.Data Transmission is the process of sending and receiving data between two systems.But it takes 5-10 minutes to reach fro m Mars to Earth.Due to weak signals there is a requirement of powerful antennas with the challenges faced in data loss and limited bandwidth where the certain amount of data can be transmitted per second.At last GPUs(Graphics Processing Unit) is required for high performance computing that is costly.

Object of the invention:

We used YOlOV10 to optimise the YOLOV7 model.Therefore,we need hardware systems for image processing using hardwares such as encoders ,sensors and cameras etc.We use multispectral imaging where one image corresponding to atleast a couple of spectral channels approximately more than 10.After gathering this data set of images,we need to improve the quality of images as sometimes they are distorted in terms of rotating and scaling and translation etc. that are specifically known as geometric transformation.Applying traditional image processing that needs predefined algorithms to perform tasks such as edge detection ,noise reduction and color correction.On the other hand , enhancement in device capabilities including memory capabilities ,computing power and power consumption ,optics and image sensor resolution is involved in acceleration of the spread of vision based applications along with improved power and cost effectiveness.

Summary of the invention:

The detailed description of the above model can be precised as it is an AI model that uses machine larning techniques.The enhancement of model needs the optimization of model by utilising the concept frequently such as applying deep learning with the help of computer visions.The aim is to detect the craters that are bowl -shaped and have round floors.They are the results of impactd from asteriods and comets and other space debris.Then we faces boulders on moon which refers to large rocks essentially large peices of debris found on the surface.It has been created by the impact of meteoroids hitting the moon.After using OHRC we are able to surface features the patterns in the data set that are mostly craters and boulders only.Therefore,we require OHRC model that detect these rocky materials of meteoroids irrespective of their attributes.It measures the selenographic coordinate system that is used to refer to locations on the surface of Earth's moon.This means any position on the lunar surface can be referenced by specifying two numerical values which are comparable to latitude and longitude of Earth.First we collect a high resolution data set that contains detailed images of the lunar surface allowing for precise identification of small features like craters and boulders.Then identifying potential hazards by landing sites analysis before a lunar lander descent.Scientific study is determined for pure observation of data set.We also try to distinguish primary amd secondary craters.It plays an important role in the distinguishing effort as it evaluates the elliptical or irregular shape of secondary craters that is usually shallower than the primary craters with the same diameter inclusion in differing rock size and center mound ,that is useful for distinguish the two.Hence we need a large number of data set that automatically detects the machine learning model these new features in new OHRC images due to which model achieves some 80.95% accuracy.Frameworks like region based CNNs are used to classify and refine object locations.Computer vision can monitor manufacturing machinery for maintenance purposes but in image processing algorithms are used to extract information from images ,restore and compress image and vedio data.Here it recognize and categorise image data which helps to browse,search and retrieve images from large data stored in the data set.NumPy is a tool for image processing in python that lets you manipulation of images using array operations.Pandas enables is used for creating heterogeneous, two-dimensional data objects and data wrangling.It makes N-dimensional homogeneous objects.Data Cleaning is done finally using pandas libraries.At last then we use a file directory like structure to organise data and allows metadata embredding.It store datasets and groups like arrays,images and grids with no attributes restrictions.It can run on a range of computational platforms.Data analysis tools are used for standard operations of HPC applications so that we can view a cross platform java based file explorer used to visually explore the file structure and work on them graphically.