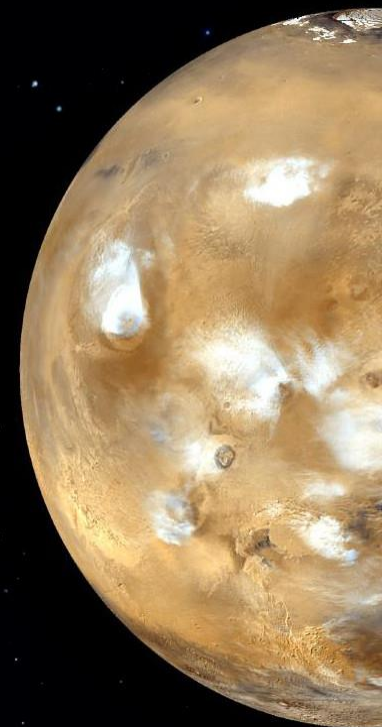
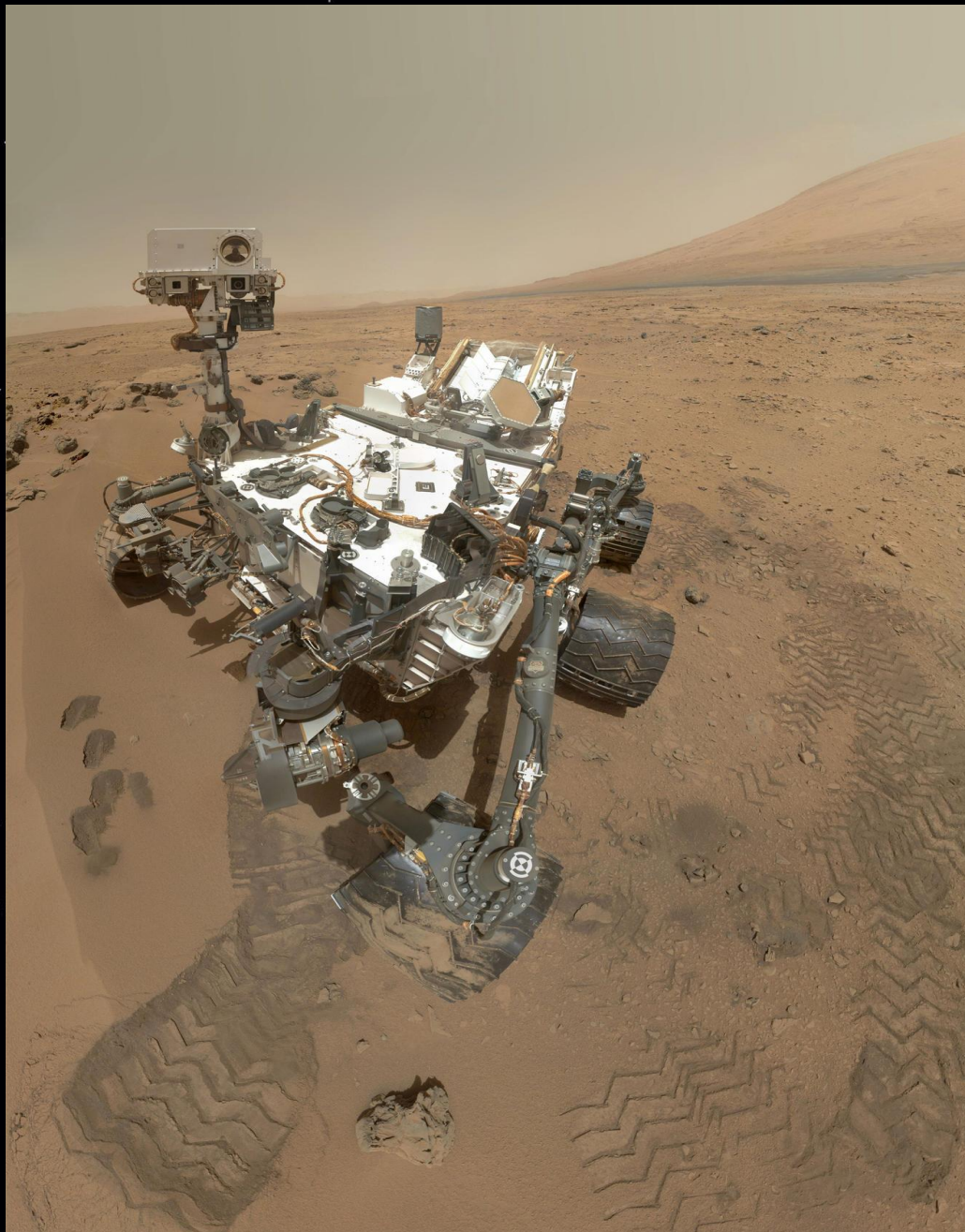


The background of the image is a deep black space filled with numerous small, distant stars. On the left side, a large portion of the Earth is visible, showing its blue oceans, green continents, and white cloud cover. On the right side, a portion of the planet Mars is visible, characterized by its reddish-brown surface and some white polar ice caps. In the center, a dark gray rectangular box contains the project title in white, bold, sans-serif capital letters.

MARS ROVER CURIOSITY IMAGE CLASSIFICATION PROJECT





Business Problem

Our aim in this project is to image classification about Mars. Images collected by Curiosity Rover which launched Nov. 26, 2011 and landed on Mars at Aug. 5, 2012.

Curiosity set out to answer the question: Did Mars ever have the right environmental conditions to support small life forms called microbes? We are going to classify images collected by curiosity rover to help future projects.

Our aim to make machine learning model and deploy at the future rovers to make future rover more effective decisions with artificial intelligence depend on mission.



Business Value

- In this project, NASA or any other space companies who work on mars can find image classification model about mars. This could help the business to deploy our machine learning model on the future rovers to make better and better decisions by itself. NASA has two future missions shows on website; first Mars Sample Return, second ExoMars 2022 Rover and Surface Platform. Our model could deploy on that missions.

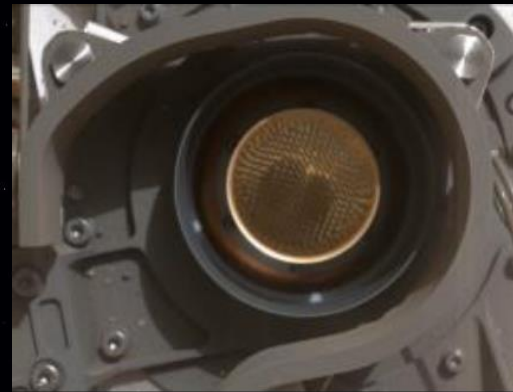
The background of the slide is a composite image of Earth and Mars in space. On the left, a large portion of the Earth is visible, showing the Americas, the Atlantic Ocean, and parts of Europe and Africa, with white clouds swirling over the blue oceans and green landmasses. On the right, a smaller portion of Mars is visible, showing its reddish-brown surface, white polar ice caps, and some atmospheric haze. The background is a deep black space filled with numerous small, distant stars.

Data Understanding

- Our data provided by kaggle and set consists of 6691 images about Mars that were collected by the Curiosity Rover. Images collected between August 2012 to July 2015. Images are 24 different category includes horizon, surface and rover's instruments(like cameras, sensors ,chemistry tools etc.).We can see some of them at the next slide.



Horizon



The Chemistry and
Mineralogy instrument

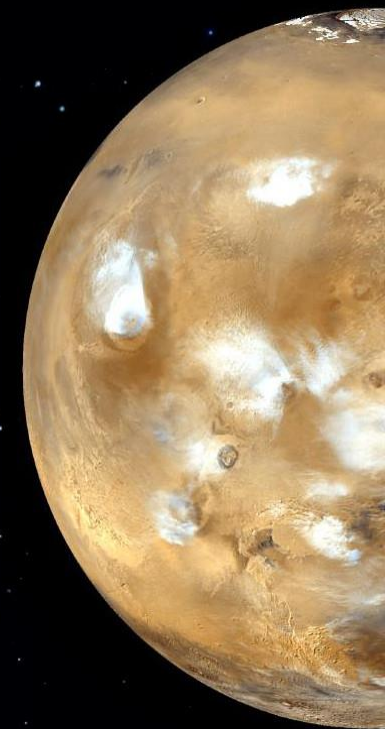
CURIOSITY



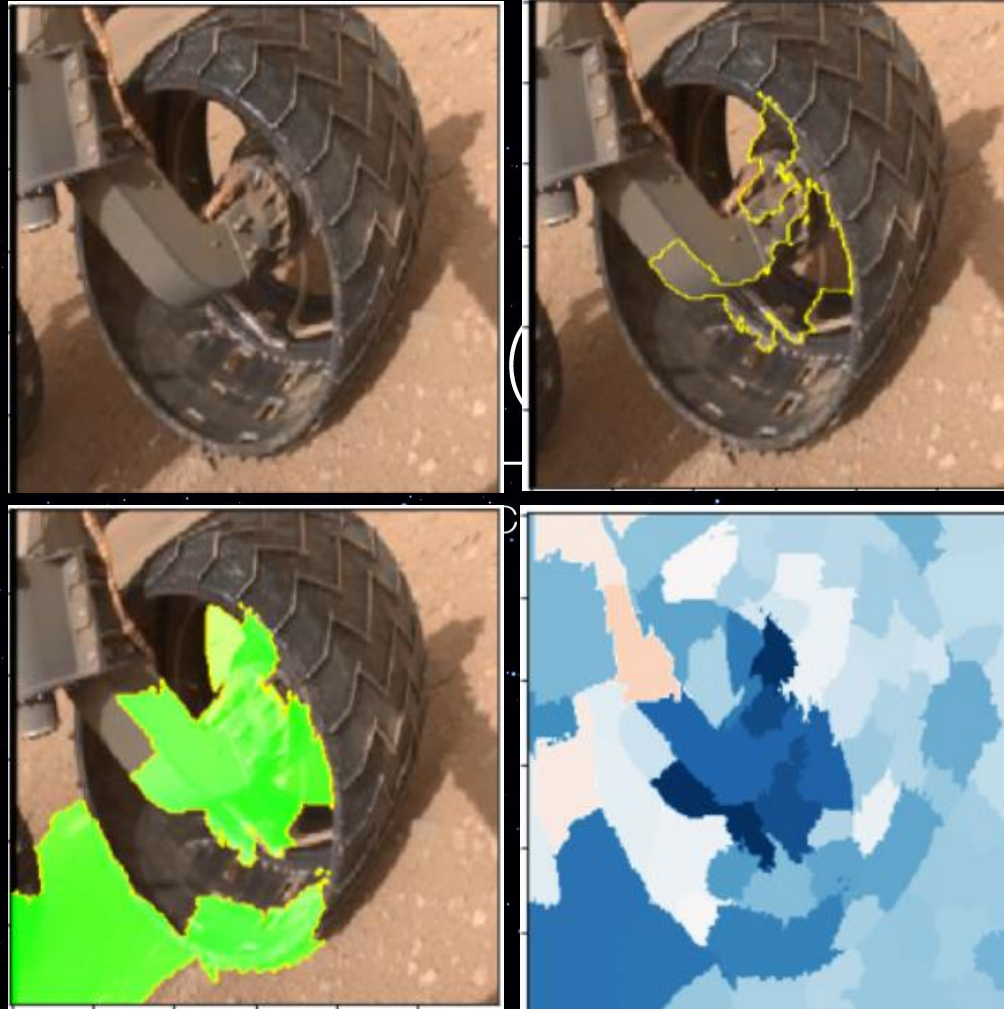
Surface



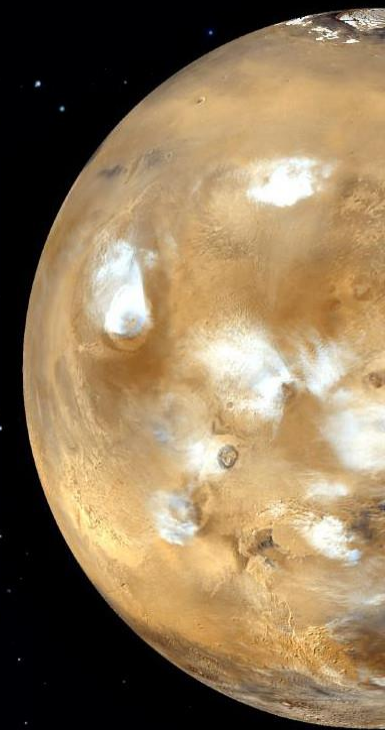
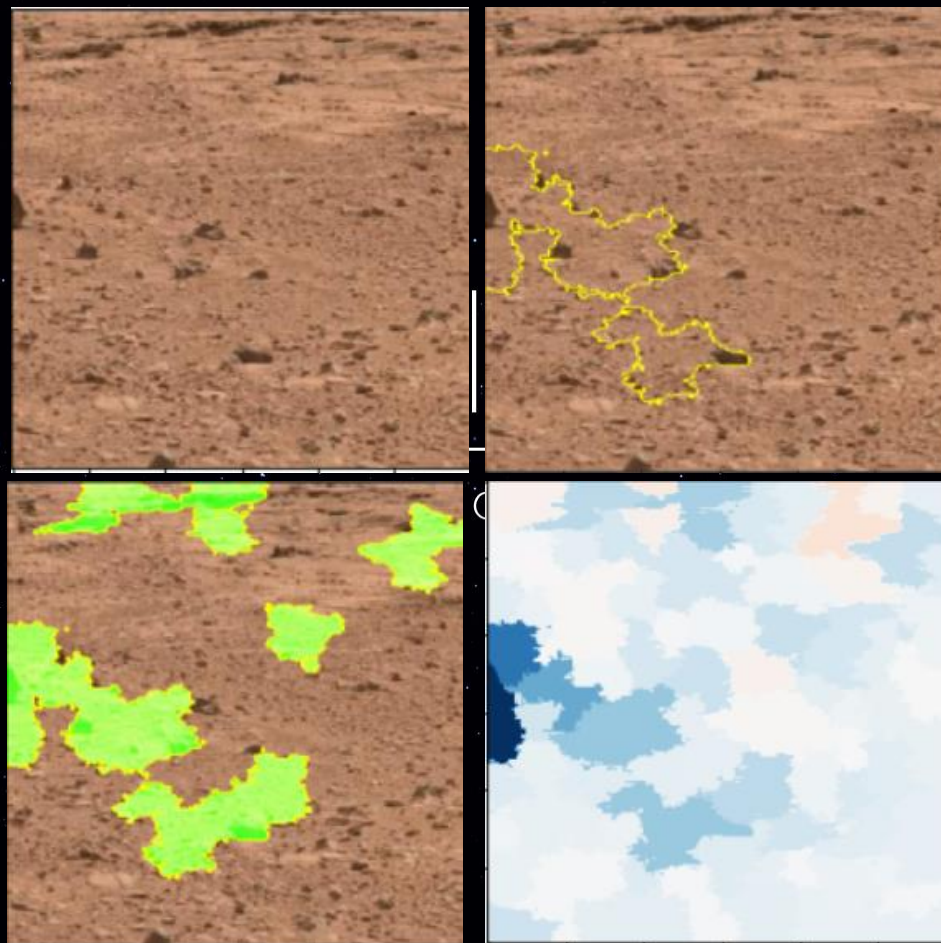
The Mast Camera



Model Explanation



Model Explanation



Conclusion

- For this project tried 3 different convolutional neural network(CNN) model basic to complex and got best result at the and as 81% accuracy predicted is true. This number weighted average on 24 different categories. For example, chemistry tool image category prediction accuracy is %50 but, scoop tool's image category prediction accuracy is %94.

The background of the slide is a composite image of Earth and Mars. On the left, a large portion of the Earth is visible, showing the Americas, the Atlantic Ocean, and parts of Europe and Africa. On the right, a smaller portion of Mars is visible, showing its reddish-brown surface and polar ice caps. The background is a deep black space filled with numerous stars of varying brightness.

Future Work

We can work on our model overall shapes to get better result.

We can gather more images about mars to get better data.(which is a little problem in this dataset)

We can try more complex models to get better result.



THANK YOU