Raster Image Processing Overview of Mars: Deimos Satellite Image Overview

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Abstract - As we all know mars is one of the smallest planet in the solar system. The rank of this planet in the system is second regarding the smallest planet and it's the fourth planet which also dint of by the sun. It has an effect of iron oxide on its surface that's why scientists call it a red planet. The atmosphere of Mars is very thin with the polar ice cap. This planet has also two moons, Deimos is one of them. But, Deimos shape is not accurate or fixed which dimensional value is (15*12.2*11) km. This paper is going to improvise the image of this planet and its natural satellite Deimos. By evaluating the matrix data of the image we are going get the raster image of this planet. This image can help to optical character extracting. Mostly, we say that the image of these planets are not real. In that case, many one says that the red portion of mars is not real. But, the real feedback is that we can mars from the earth due to its red surface. And, that's why mars is a red planet. We can differ this planet from others with this option. In this paper, we are going to show the most accurate processed image of mars and its natural satellite Deimos with histogram panel and gamma scale. This paper aims to give hints for further mission to mars, creating sense about the planet to the peoples and give an update surface image of Deimos which is very important.

I. INTRODUCTION

Mars is the planet that has a mass of $6.4171*10^{23}$, density is 3.9335 g/cm^3, area of surface is 144798500 km^2. This is the normal physical overview of this planet. In the case of the process of its image, we need to know the different types of information about this planet which are very common in our popular blogs about mars. But, here we are going to give the information shortly and simply. We need to know three types of information regarding this planet. These are:

- Orbital information
- Physical information (As we mentioned the mass, density and area, that's why we will skip these three from next informations)
- About atmosphere

We can consider this planet with an epoch. We are going to know its orbital information firstly with Epoch J2000. The orbital period of this planet is 686.971 d which is mostly equal with (1.88082 yr). The average orbital speed is 24.007 km/s which is equal with (53 700 mph). Syn period of this planet is 779.96 d. Longitude od node is 49.558°. Perihelion is 286.502°. As we know it has two natural satellites. Of all the planets, Mars is the most Earthlike, inviting geochemical comparisons. Geochemical data for Mars are derived from spacecraft remote sensing, surface measurements, and Martian meteorites"(McSween,2013). Now, we need to know about the physical measurement of this red planet. The radius of mars is 3389.5 ± 0.2 km.Hydrogen deuterium oxide (0.00008%), Krypton (0.00003%) ,Xenon (0.00001%). Mars is characterized by geological landforms familiar to terrestrial geologists. It has a tenuous atmosphere that evolved differently from that of Earth and Venus and a differentiated inner structure"(Mangold,2016). Now, we are going to scale and process the images of mars. After that, we will do about Deimos.

II. MATERIALS AND METHODOLOGY

We have collected the mars image and planetary video from NASA and also have gotten the data set about mars. We will use a registry system to process the video and image. The method is very clear. We need to process the video of mars with PIPP by which we can get the TIFF image by which we can manipulate images and can read the optical character also.

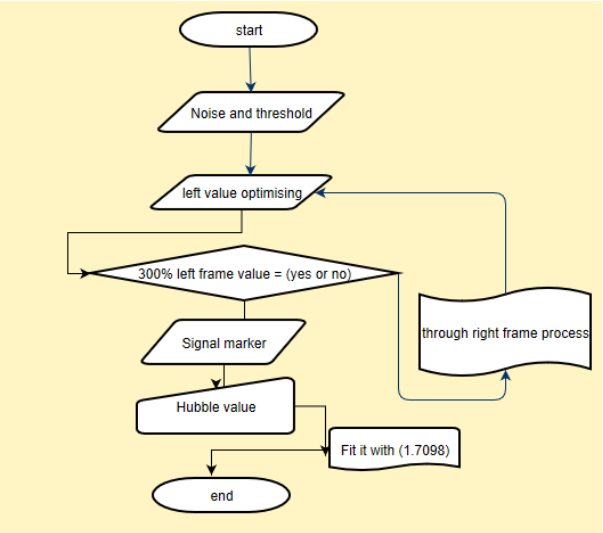

Figure 1: Ninox Diagram

After that, need to code for histogram panel settings and gamma scaling by which the surface view of the image can be raster. So, here the value of axis and histogram panel:

Anchor Feature Box value is (X,Y) = (150%,140%).Area Of Interest value is (X,Y) = (300%,300%).Now, we need to use original Ninox algorithm.But,here we updated the algorithm which diagram is given in Fig.1:

Now, we are going to predict the distance of mars from earth by revolutionary algorithm. The evaluation is going to give the upcoming years data of distance but all about prediction. Here the output given below:

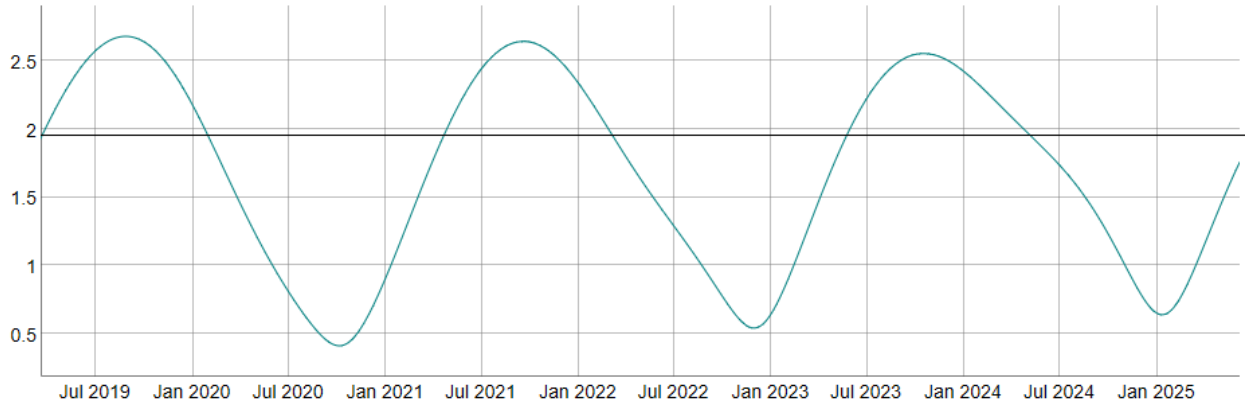

Figure 2: Predict graph of distance from earth (Based on 2019)

Here, We can see that the pick values of per year are not the same. This is for imaging the surface of this planet. According to all these data set the preview histogram panel is given below:

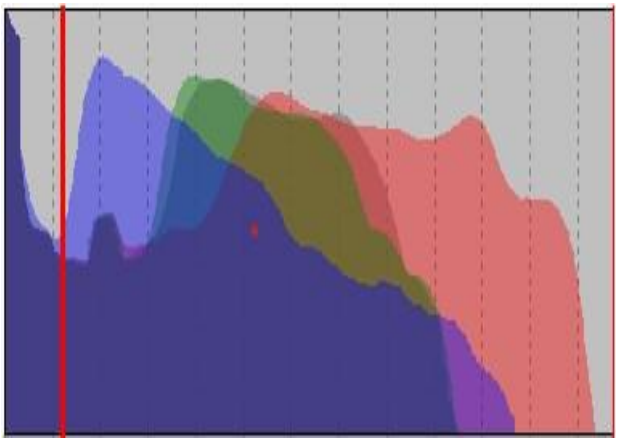

Figure 3: Histogram Panel

The scale is there (X,Y) = (458,256).Now, The graphical view of the gamma scale is given below:

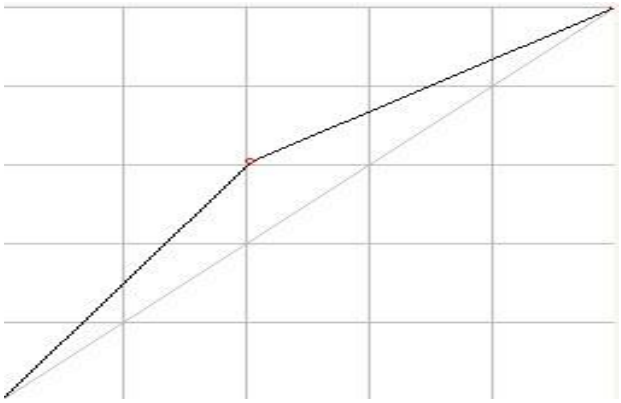

Figure 4: Gamma scale

By varying the ratio of the total mass in the embryo population to the total mass in the planetesimal population"(Jacobson,2014).Here the wavelet form in the gaussian filter. After processing all these graphs we are going to get the main image of Mars and Deimos. Which is given below in Figure 5 and Figure 6.

III. RESULT AND DISCUSSION

The nature of the early Martian climate is one of the major unanswered questions of planetary science"(Wordsworth,2016). The processed image with the present condition is given below:

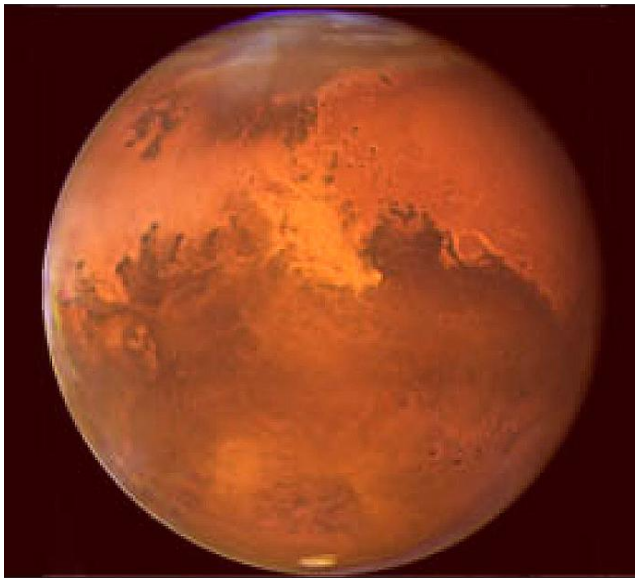

Figure 5: Final image of mars

Mars RA : 23h 20m 05s. Few traces of Earth's geologic record are preserved from the time of life's emergence, over 3,800 million years ago"(Michalski,2018).

Figure 6: Deimos

CONCLUSION

So, using very simple toolkits and algorithms we have done the image processing of mars and its natural satellite Deimos. By implementing this procedure youth researchers can easily process the image of planets and can see or observe the total view. After getting this type of procedure computational technology can also get improvisation of theory. But, the main thing is that NASA and other organizations are helping us a lot by providing real-time data. Our aim is all about predicting planets distance in future and mass deviations compare with earth, By comparing and implementing all these things maybe we can also find some clues by which peoples can get a fine circumstance. The scope of this paper is very simple. We want to create a sense of this sector.

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