GMT 232

PHOTOGRAMMETRY-I

Assignment 1

Question-1

Explain Sentinel-2 dataset. Which bands do you get when you download the dataset? What are bands' characteristics (both geometric and radiometric)?

Answer-1

Our bands are aerosol detection, red, blue, green, vegetation classification, near infrared, water vapour, cirrus, snow / ice / cloud discrimination. The 13 spectral bands of Sentinel-2 range from Visible (VNIR) and Near Infrared (NIR) to Shortwave Infrared (SWIR): 4 x 10 meters Tapes: three classic RGB tape ((Blue (~ 493nm), Green (560nm) and Red (~ 665nm))) and Near Infrared (~ 833nm) tape; 6 x 20 meters Bands: 4 narrow Bands (~ 704nm, ~ 740nm, ~ 783nm and ~ 865nm) in VNIR vegetation red edge spectral area 2 wide SWIR bands (~ 1610nm and ~ 2190nm) snow / ice / cloud detection or vegetation moisture stress assessment; 3 x 60 meters Tapes mostly for cloud scanning and atmospheric correction (~ 443nm for aerosols and ~ 945nm for water vapor) and focused on cirrus detection (~ 1374nm).

Radiometric resolution is the instrument's capacity to distinguish between light intensity or reflection differences.The greater the radiometric resolution, the more accurate the perceived image.

Question-2

Open and read all bands of your Sentinel-2 dataset. Choose an area from the dataset and find the area in all bands. Do you see any differences? Does the appearance of the area change from band to band? Explain.

Answer-2

The difference between the two images increased pixel values, so the colors became more apparent. brightness also increased.

Question-3

Why do we need different bands other than RGB? Which band combinations help us detect clouds in an image?

Answer-3

We need to distinguish objects of different wavelengths that visible light cannot distinguish. For example, we need different bands to distinguish rain cloud and chlorophyll in plants. So we use bands other than RGB. To detect clouds: 2 wide SWIR bands (~ 1610nm and ~ 2190nm) snow / ice / cloud detection or vegetation moisture stress assessment, 3 x 60 meters Tapes mostly for cloud scanning and atmospheric correction (~ 443nm for aerosols and ~ 945nm for water vapor).

Bonus Question-1

Search two publications that used Sentinel-2 dataset for their work in photogrammetry field. For each publication, write aim of the study and how the Sentinel-2 dataset are used.

Answer-1

Accurate information about the determination and efficiency of cultivated crops in agricultural areas helps to make sound decisions in planning and investments to be made in agriculture and other fields related to agricultural production. One of the important issues addressed during planning and investment is the production and efficiency of the product planned to be invested in the region. Today, it is important to access information quickly, in the least costly and reliable way. For these reasons, remote sensing has an important place in the field of agriculture. In this study, it was aimed to produce land use for the yield estimation by monitoring the development stage of the sunflower plant in the region selected in the district of Zile in Tokat province. In order for the yield estimation to be made correctly, the product pattern must be determined properly at every stage of the plant. In the first phase of the sunflower plant, the transition date of the Sentinel 2A satellite image was previously examined and data was collected from the field simultaneously with the satellite transition.

The Sentinel-2A satellite is a multispectral device developed by ESA with mid-spatial resolution (10-60). One of the functions of these satellite sensors in general are the mapping processes for land cover and usage. In recent years, it has been observed that different studies have been carried out to demonstrate the adequacy and potential of the Sentinel-2A MSI (Multispectral Instrument) satellite sensors. In our country, the limited number of studies performed with Sentinel-2A satellite images reveals the importance of this study. The main purpose of this study is to determine the temporal change of the land cover and usage of Giresun province using Sentinel-2A satellites. In this context, satellite images from the Sentinel-2A satellite of Giresun city center for 2017 and 2018 were obtained from ESA's data provider web address. In this study, land cover changes for these two years were determined and the losses and gains of the land classes were calculated. In the application carried out on an area of approximately 29 km 2, it has been determined that green and construction areas change place within themselves. In addition, it has been calculated that approximately 63 hectares of land passes from green areas to construction areas. As a result, Sentinel-2A satellite images, which provide free access, have been demonstrated to be useful in determining land cover and use.

REFERENCES:

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https://gdal.org/drivers/raster/sentinel2.html

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