Tech Test: Computer vision

Task 1: Coding – NDVI Calculation

You are provided with TIFF images (PW: IDP@Paltech) captured by a drone equipped with a multispectral camera. The camera captures four spectral bands:

- Green (G): 560 ±16 nm
- Red (R): 650 ±16 nm
- Red Edge (RE): 730 ±16 nm
- Near-Infrared (NIR): 860 ±26 nm

Objective:

Calculate the NDVI values for each pixel in the images. Please refer to this guide for more information.

Requirements:

- Read the multispectral TIFF images to extract data for the respective bands.
- Align the images and correct the distortion.
- Calculate the NDVI for each pixel using the formula provided.

Deliverables:

- A script written in Python that performs the above calculations and generates a plot of the NDVI.
- A brief report explaining the steps taken in the script, any assumptions made and difficulties faced.

Task 2: Plant Center Detection Using RGBD Images

Objective:

Develop a concept to determine the center of the plant in the images using image processing techniques.

Requirements:

- Describe a method to process RGBD images to find the center of the plant. Take into consideration that those images are highly noisy due to overlaying grass (like the sample image).
- Justify your chosen method with references to relevant literature and algorithms that support your approach.
- Consider factors such as varying lighting conditions, plant orientation, and background clutter in your concept.

Deliverables:

- A detailed concept document outlining your proposed method.
- Include diagrams or pseudocode to illustrate your approach.
- Cite all sources and literature used to support your method.