Package 'LARGB'

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Type Package

Title Leaf Area Determination from Visual Image

Version 0.1.0

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Description

Measurements of leaf area are important in the studies of plant biological characteristics. High-throughput plant phenotyping using image analysis is the key area in the domain of plant phenotyping. For determining the leaf area, the RGB image is converted into the grayscale image by simply averaging the Red(R), Green (G) and Blue (B) pixel values. Grayscale image is then converted into a binary image using Otsu's thresholding method Otsu, N. (1979) <doi:10.1109/TSMC.1979.4310076> to separate plant area from the background (image segmentation). The segmentation process was accomplished by selecting the pixels with values over the threshold value belonging to the plant region and other pixels to the background region. The resulting binary image consists of white and black pixels representing the plant and background regions, respectively. Finally, the number of pixels inside the plant region was counted and converted to square centimetres (cm2) using the reference object (any object whose actual area is known previously) to get the projected leaf area.

License GPL-3

Encoding UTF-8

Imports imager, dplyr

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LARGB *Leaf Area Determination from Visual Image*

Description

High-throughput plant phenotyping using image analysis is the key area in the domain of plant phenotyping. For determining the leaf area, the RGB image is converted into the grayscale image by simply averaging the Red(R), Green (G) and Blue (B) pixel values. Grayscale image is then converted into a binary image using Otsu's thresholding method Otsu, N. (1979) <doi: 10.1109/TSMC.1979.4310076> to separate plant area from the background (image segmentation). The segmentation process was accomplished by selecting the pixels with values over the threshold value belonging to the plant region and other pixels to the background region. The resulting binary image consists of white and black pixels representing the plant and background regions, respectively. Finally, the number of pixels inside the plant region was counted and converted to square centimetres (cm2) using the reference object (any object whose actual area is known previously) to get the projected leaf area.

Usage

```
LARGB(img_path, ref_area)
```

Arguments

img_path	character string containing file path of the visual(RGB) image
ref_area	a numeric value containing known pixel area (in cm square) of the reference object

Value

Pixel area along with the leaf area in cm square

References

Patil, S. B., & Bodhe, S. K. (2011). Betel leaf area measurement using image processing. *International Journal on Computer Science and Engineering*, 3(7), 2656-2660.

Misra, T., Marwaha, S., Arora, A., Ray, M.,Kumar, S., Kumar, S. (2021). Leaf area assessment using image processing and support vector regression in rice. *Indian Journal of Agricultural Sciences*, 91 (3), 388–92.

Xu, X., Xu, S., Jin, L, and Song, E. (2011). Characteristic analysis of Otsu threshold and its applications. *Pattern Recognition Letters*, 32(7), 956–61.

Examples

```
fpath= system.file('extdata/test1.jpg', package = 'LARGB')
LARGB(fpath, 0.025)
```

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