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Comparative analysis of multispectral sensors (MicaSense RedEdge-MX, FLIR Vue Pro R, Parrot Sequoia) and image processing for crop health assessment

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Abstract

Multispectral images captured by drones represent a crucial source of information for assessing plant health, chlorophyll content, water stress, and crop productivity in precision agriculture. The quality of these data is closely linked to the performance of the multispectral sensors employed, including parameters such as spectral sensitivity, radiometric calibration, spatial resolution, and stability under variable lighting conditions. Data obtained from these sensors are processed using vegetation indices, which provide clear insights into plant condition and vigor. The objective of this project is to conduct a comparative evaluation of the MicaSense RedEdge-MX, FLIR Vue Pro R, and Parrot Sequoia sensors in collecting data over the same agricultural plots, as well as to calibrate the images to produce radiometrically and spectrally standardized datasets, enabling the automation of crop monitoring processes.

Keywords: *agriculture; image calibration; multispectral sensors; vegetation index*

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