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Inteligent system to identify oil palm crop units from multispectral aerial images: Identification of multispectral patterns

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Abstract:
Globally, the oil palm industry leads the supply of oils and fats, and is a very dynamic sector thanks to its wide use and applications in different products. However, some studies have shown that oil palm cultivation causes enormous damage to the environment by the destruction of existing forests, or by excessive use of fertilizers and pesticides, making crude palm oil uncompetitive and strong constraints for its implementation worldwide. To improve the production of crude palm oil, assisted pollination plays a fundamental role in reducing the use of fertilizers. This is why this article presents a flexible Fuzzy ARTMAP model, for the segmentation and identification of oil palm crop units from the characterization of multispectral aerial images. The results show that the proposed model was able to identify complete seed units from polar patterns obtained from the segmentation using grayscale images, as well as the identification of sowing unit that are susceptible to be pollinated by the characterization of each unit of planting using three vegetation index such as: NDVI (Normalized Difference Vegetation Index), GNDVI (Green NDVI) y RVI (Red Vegetation Index).

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