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New scientific article published: "Assessing the Performance of RGB-D Sensors for 3D Fruit Crop Canopy Characterization under Different Operating and Lighting Conditions"

Jordi Gené-Mola et al. have published a new article in **Sensors (MDPI).** The research is related to the PAgFRUIT Project. Hightlights: This work presents a methodology for assessing RGB-D sensors used in fruit tree orchards within the framework of precision agriculture. This was used to evaluate the performance of the Kinect v2 sensor under different scanning conditions.

Authors: Genñe-Mola, J., Llorens, J., Rosell-Polo, J.R., Gregorio, E., Arnó, J., Solanelles, F., Martínez-Casasnovas, J.A., Escolà, A., 2020. Assessing the **Performance of RGB-D Sensors for 3D Fruit Crop Canopy Characterization under Different Operating and Lighting Conditions**. *Sensors* 20(24), 7072; https://doi.org/10.3390/s20247072 [https://doi.org/10.3390/s20247072]
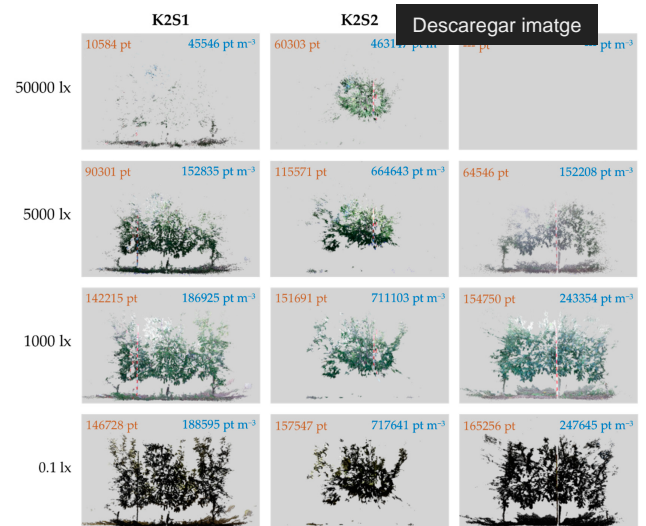
Point clouds acquired from sensor stations K2S1, K2S2 and K2S3 under different illuminance conditions.

Abstract: The use of 3D sensors combined with appropriate data processing and analysis has provided tools to optimise agricultural management through the application of precision agriculture. The recent development of low-cost RGB-Depth cameras has presented an opportunity to introduce 3D sensors into the agricultural community. However, due to the sensitivity of these sensors to highly illuminated environments, it is necessary to know under which conditions RGB-D sensors are capable of operating. This work presents a methodology to evaluate the performance of RGB-D sensors under different lighting and distance conditions, considering both geometrical and spectral (colour and NIR) features. The methodology was applied to evaluate the performance of the Microsoft Kinect v2 sensor in an apple orchard. The results show that sensor resolution and precision decreased significantly under middle to high ambient illuminance (>2000 lx). However, this effect was minimised when measurements were conducted closer to the target. In contrast, illuminance levels below 50 lx affected the quality of colour data and may require the use of artificial lighting. The methodology was useful for characterizing sensor performance throughout the full range of ambient conditions in commercial orchards. Although Kinect v2 was originally developed for indoor conditions, it performed well under a range of outdoor conditions. .