

## Science Hack 2021 – Season 2

### Challenge: Deep Learning for Object Detection in The Context of Smart Agriculture

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Quantitative characterization of **plant traits and their dynamics** is essential for breeders and scientists to understand the biological mechanisms of the responses to the environment and stresses. Because traditional methods for measuring traits are often based on manual work, sensors and imaging technologies are increasingly used in agriculture. This creates more demands for accurate and automated methods that can extract meaningful information from the images.

Many image analysis methods have been developed and used in agricultural research and development, but they are often dependent on the ‘hard’ thresholding. Thus, the applicability of such methods is often limited, e.g., dependent on weather and light conditions when taking images, as well as the heterogeneous background in the images. Machine learning (ML) and deep learning (DL) methods have shown promise in a range of tasks of digital image analysis; yet, the potential is not fully explored for many applications in agriculture. **Therefore, the main objective of this challenge is to develop ML or DL models to detect maize plant tassels under a diverse range of light conditions and application scenarios.** This challenge holds great promise to facilitate the development of “Human-Centered Technologies” for future agriculture.

