

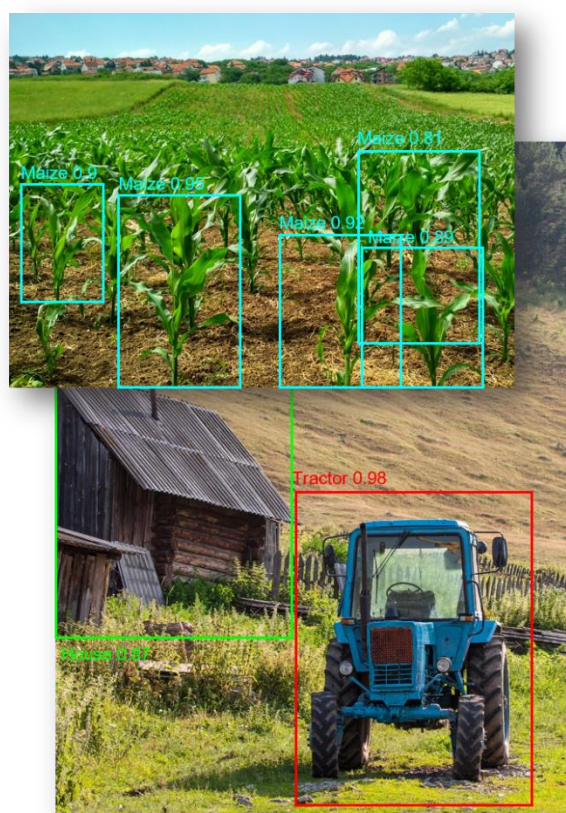
## Extending agricultural robot capabilities for weeding with laser – WeLASER navigation strategies

### Challenges

Research on navigation strategies that supports precise actuation and protects the soil and crops is an important topic. The navigation of commercial robotic systems that perform weed management is limited within the field. The incorporation of new tools and navigation strategies that maintain safety and accuracy conditions on the entire farm is a challenge.

### Techniques

In the WeLASER project, we address these challenges by incorporating Artificial Intelligence techniques to improve navigation. Within these techniques we can name the use of Convolutional Neural Networks (CNN) for image analysis and identification and classification of objects and features within the farm, to locate the robot based on semantic analysis.



### Solutions

The solution is to teach the robot to identify the elements within the farm, whether they are natural (crops, trees, roads, etc.), or artificial (tractors, machinery, buildings, etc.), including people and animals. The robotic system will be able not only to locate itself in an absolute reference frame (like GNSS), but rather to locate itself in a specific area in the farm by observing and identifying its surrounding. A specific structure (like a wall), or a tree with particular characteristics, or even identifying the type of crop, allows the robot to be located inside the farm as a human does.

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