

Tracking the beetles - Building a computer vision infrastructure for beetle detection and tracking.

Crops, food, and water are limited while population pressure continues to tip the balance against proper land and resources while crops and water are limited making agricultural production critical for any form of sustainable future.

Little known but some insects are one of the major factors that threaten yield efficiency in agricultural areas, in fact, insects cause more destruction than a forest fire, and during climate change harmful insects are reproduced more, increasing the damage of climate change further. Luckily enough there are other insects that deter predation by eating them and thus protect the plants. Such insects are often hard to find, recognize or classify.

Manual methods require substantial time investment in trapping and subsequent species identification. Other advanced techniques elevate the needed tasks yet are still behind when working and tracking a massive number of insects with limited human labor and effort.

Nowadays computer vision methods and techniques can enable us to detect, track and classify objects and insects automatically.

In a collaboration with the Volcani Center, ladybugs as natural detectors of crops are investigated, looking at their eating behavior for the aim of selective breeding of the most effective natural enemy (eating aphids that destroy crops). As part of this collaboration, the aim of this project was to develop automated monitoring methods for ladybugs in a laboratory setting (on a plate) using computer vision techniques. A neural network ScaledYOLOv4 was used for training and reached up to %90 accuracy in detection.