Automated pest detection in plant trials

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As our global climate changes, our reliance on pesticides to grow crops continues to increase. One method to reduce the overuse of pesticides may be the age-old tradition of "companion planting", in which a second plant is grown alongside the first to attract predators that eat pests. To determine if this approach can be applied at scale, we have partnered with RHS Wisley. If proven successful, this method can be applied to fruit and vegetable crops to improve both food security and food sustainability.

However, to determine if this approach effectively reduces pest infestation, we must track how pest numbers change across the growing season. Traditionally, this requires regular, by-hand 'bug counting days': a highly inefficient technique that definitely isn't applicable at scale. To optimise this process for wide-scale use, we will combine high-resolution photography with source detection techniques developed in astronomy.

In this internship, we will develop AI algorithms, with a training set built from labels determined by the general public ("citizen science" http://zooniverse.org//projects/samoates/rhs-wisley-bug-watch) to automate the detection of invasive pests. The astrophysics group at Lancaster has already developed and applied such techniques to a diverse range of challenges spanning global security, healthcare and catastrophe management. In this 8-week study, we will update RHS Wisley Bug Watch with photographs of a new companion plant trial run by the RHS Wisley team, and advance initial efforts to develop machine-learning algorithms to automate pest detection. If successful, this technique will be rolled out across the RHS to quantify the importance of companion planting across all crop types.