Automated Identification of Invasive Honeysuckle

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Asian bush honeysuckle is a common invasive species of plant in the midwestern United States. It damages native ecosystems and requires significant time and manpower to treat. This project used drones and AI to automate the process of identifying invasive honeysuckle, making location over large areas, or areas with difficult or dense terrain, significantly more efficient. Using a drone, top down footage was collected from areas where invasive honeysuckle was known to be present and areas where it was absent. The footage was downloaded to a computer, separated into individual frames, and manually sorted into different folders based on the presence or absence of honeysuckle. These images were used to train a publicly available AI model to differentiate between images containing honeysuckle and not containing honeysuckle. To ensure accuracy, as large and diverse a data set as was possible, was provided to the AI. A portion of the images were reserved for use later to test the accuracy of the AI. In an initial test the AI was able to correctly identify images with honeysuckle 87.5 percent of the time and images without honeysuckle 42.6 percent of the time showing a strong bias towards believing an image contains honeysuckle. The future application of this project would be to create a program that automatically feeds drone footage through the AI, while simultaneously recording where in the drone's flight path each image was captured. The program could then use this information to map honeysuckle infestation, allowing manpower to be focused on eradication rather than identification. This would significantly streamline the process of dealing with honeysuckle or other invasives.