Detecting plant leaf disease using deep learning on a mobile device

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The team's approach exploits the recent evolution of computational systems and especially graphical processing units (GPUs) that allow machine learning operations to be carried out efficiently in ways that previous generations of devices simply could not match for speed. Such operations facilitate the running of tools such as convolutional neural networks, which mimic certain characteristics of brain function, and allow image recognition and related tasks to be carried out quickly. The team thus embedded image recognition of the characteristics of disease in leaves for the present research.

Despite the great speed and accuracy of disease diagnostics that the team has shown, there is still room for improvement. They highlight an issue with shadows on images and confusing backgrounds when a user takes a photo of a suspect leaf. They hope to be able to develop a pre-processing step that will reduce any problems and the inaccuracies that might arise if the acquired leaf image is not as perfect as it might be for image recognition. Fundamentally, automated light level adjustment in the image would preclude issues arising because of shadows, while a step that isolates the leaf from its background in the image and effectively removes said background would ease the whole process still further and hopefully nudge the accuracy upwards.


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