Drones for More Crop per Drop

Problem Statement: Indian farmers depend largely on traditional agricultural practices and ancestral knowledge of farming. However, there are a few challenges to pursuing agriculture considering climate change (acid rain, temperature fluctuations, precipitations) aspects. On the other hand, implementing technology and its knowledge regarding overall farming (like proper watering, use of fertilisers, or pesticides) and timely harvesting of healthy crop yields need to be resolved in today's farming. For these operational efficiencies, the digital revolution in agriculture is the need of the hour. This project is a stepping stone towards using technology by small and large-scale farmers; By utilising this technology, they will be able to decide when, where, what, and how many inputs of resources they need for healthy farming practises.

Uniqueness of the Solution: The present technique uses science-based and machine-learning approaches on pure-pixel hyperspectral data to create models that can run on low computational power machines. The models can create plant-level stress maps. Farmers can distinguish between crop water and nitrogen stress using remotely sensed hyperspectral data as a solution for healthy farming.

Current Status of Technology: The models are validated a couple of times on the research front and ready to be used by the production team to make it a viable decision support system software for farmers.

Societal Impact: The technique will help reduce groundwater pollution by minimising the nitrate-nitrogen losses from agricultural land. Using this method achieves a huge reduction in soil pollution, especially soil heavy metals and the amount of fertilisers. The optimal use of chemicals in the farm and the food grains help to manage the food safety standards through reduced health risk issues to the farmers and consumers. Maintaining food security through optimal use of fertilisers helps achieve optimal yield without damaging soil fertility in the long run.

Patent(s): Nil

Relevant Industries: Agriculture, Sensors, Water, Remote sensing, Spectroscopy.

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