

Web and Smart Phone-based Platform Combining Artificial Intelligence and Satellite Remote Sensing Data to Geoenable Villages for Crop Health Monitoring

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Abstract : Recent food price hikes may signal the end of an era of predictable global grain crop plenty due to climate change, population expansion, and dietary changes. Food consumption will treble in 20 years, requiring enormous production expenditures. Climate and the atmosphere changed owing to rainfall and seasonal cycles in the past decade. India's tropical agricultural relies on evapotranspiration and monsoons. In places with limited resources, the global environmental change affects agricultural productivity and farmers' capacity to adjust to changing moisture patterns. Motivated by these difficulties, satellite remote sensing might be combined with near-surface imaging data (smartphones, UAVs, and PhenoCams) to enable phenological monitoring and fast evaluations of field-level consequences of extreme weather events on smallholder agriculture output. To accomplish this technique, we must digitally map all communities agricultural boundaries and crop kinds. With the improvement of satellite remote sensing technologies, a geo-referenced database may be created for rural Indian agriculture fields. Using AI, we can design digital agricultural solutions for individual farms. Main objective is to Geo-enable each farm along with their seasonal crop information by combining Artificial Intelligence (AI) with satellite and near-surface data and then prepare long term crop monitoring through in-depth field analysis and scanning of fields with satellite derived vegetation indices. We developed an AI based algorithm to understand the timelapse based growth of vegetation using PhenoCam or Smartphone based images. We developed an android platform where user can collect images of their fields based on the android application. These images will be sent to our local server, and then further AI based processing will be done at our server. We are creating digital boundaries of individual farms and connecting these farms with our smart phone application to collect information about farmers and their crops in each season. We are extracting satellite-based information for each farm from Google earth engine APIs and merging this data with our data of tested crops from our app according to their farm's locations and create a database which will provide the data of quality of crops from their location.

Keywords : artificial intelligence, satellite remote sensing, crop monitoring, android and web application

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