

Summer School Report

By

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GRSS Summer School:

Digital Agricultural Technologies

March 27-30, 2023

This three days Online Summer school was held by the IEEE GRSS Hyderabad Chapter during the month of march 2023.

Here you can find the complete schedule and the names of all the speakers <https://grsshyd2023.org/>

The various topics discussed during the different presentations can be grouped into three main themes: Geospatial, Computer Vision and AI for Agriculture, Smart Agriculture, Water Risks and Management in Agriculture. You'll find more information in the following section below.

All themes are strongly interconnected and come together to address Digital Agriculture Technologies.

Geospatial for Agriculture:

- Use of satellite imageries (Sentinel 2 / Landsat 8 / Resourcesat 1,2,2A)
- Applications (Crop monitoring, Crop land, crop inventory, crop mapping,...)
- Methods (Supervised, Unsupervised and rule-based classification, Crop growth simulation model, multi-criteria methods...)

Computer Vision for Agriculture and Smart Agriculture:

- Applications (Pest management, Livestock management, Health crop monitoring)
- Methods (Semantic and instance Segmentation, Convolutional Neural Network...)
- Example workflow for pest management:
 - Using Machine and Deep Learning detection of the pest
 - Using drone to apply pesticide on the specific area.

Water Risk and Management in Agriculture:

- The International Water Management Institute (IWMI) is a research-for-development (R4D) organization. Find more information here: <https://www.iwmi.cgiar.org/>
- Using the methods and technologies of the previous section to developpe Drought and Flood assessments workflow.
- Example workflow for Flood:
 - Find agricultural land was flood.
 - Using flood estimation for create evacuation roads
 - Estimating flood depth, duration, cost production, crop stage.
 - Estimating loss of the farmer
 - Create Prevention, Action and planification plan.
 - Using Blockchain and smart contract to pay insurance automatically based on the flood assessment.