Application of drones for agriculture

Jimut Bahan Pal
22D1594

DS 899: Communication Skills
IIT Bombay

Under the Guidance of
Prof. A. Alankar

Introduction

- Drones are used in agriculture to **increase efficiency, reduce costs, and improve crop yields** while **minimizing environmental impact**.

- Their successful applications are:

    - **Livestock monitoring** - amalgamated with Artificial Intelligence.

    - **General surveillance** - on rugged terrains.

    - **Crop mapping** - to check for areas that need more attention.

    - **Soil analysis** - to check the pH of soil by collecting samples.

    - **Planting and seeding** - for faster deployment.

    - **Pesticide control** - saves pesticides by distributing it proportionately.

    - **Irrigation management**.

https://ag.dji.com/

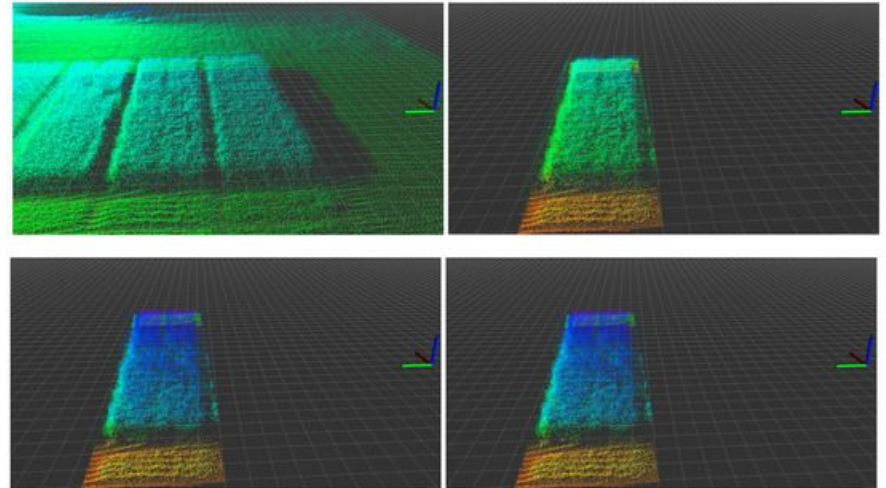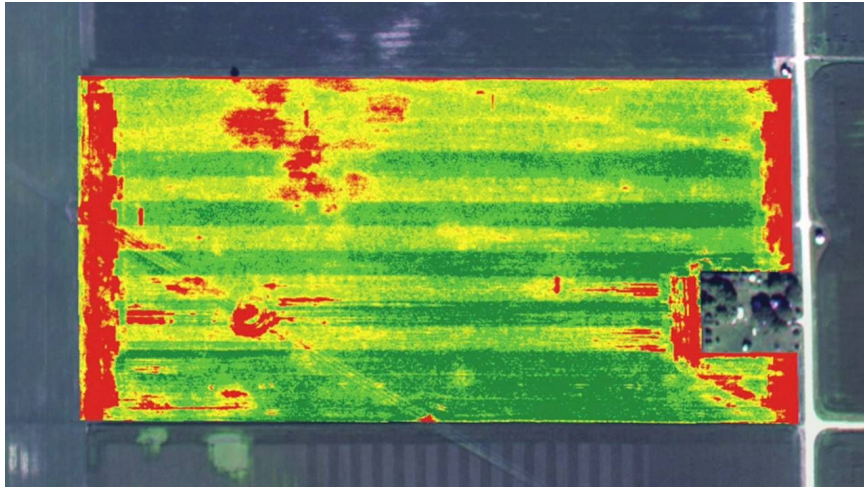https://consortiq.com/uas-resources/using-drones-in-agriculture-industry

Livestock monitoring and General Surveillance

- **Thermal sensors** embedded in drones can help monitor hidden animals that are difficult to track.

- **Artificial Intelligence, Deep Learning, and Computer Vision algorithms** can help to **monitor trespassers** over a wide range of areas.

- **Unmanned Aerial Vehicles (UAV)** can provide surveillance over a large area with **minimum human intervention** in an efficient way.
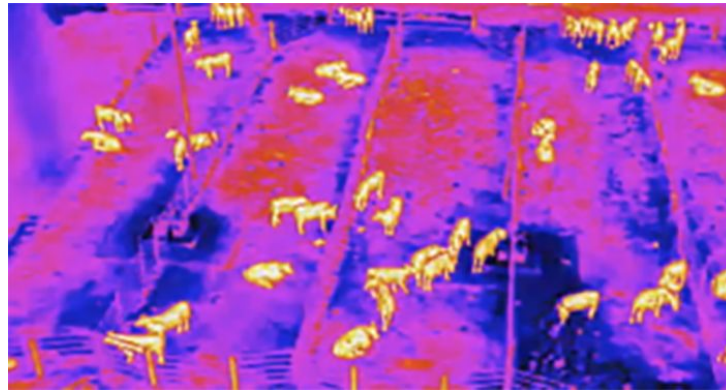
Crop Mapping & Soil Analysis

- Drones can **monitor** crops' health for a long **time by going over pre-defined areas**, which helps researchers collect data and develop new **policies**.

- They can check which part of the fields needs **attention from pests, irrigation, nutrients (pH value of soil)** when to **harvest** the crops, and to **optimize the farming practices**.

Designing and Testing a UAV Mapping System for Agricultural Field Surveying, Christiansen et al., 2017, Sensors

Planting, Seeding, Pesticides Control and Irrigation management.

- Drones are equipped with **devices that can plant seeds directly in the soil**, also called **seed bombing -** which has seeds, compost, and other nutrients - ensuring **precision agriculture**.

- Drones can also be used for spraying pesticides effectively over **rocky terrain** where farmers cannot go due to safety reasons. This ensures **worker safety**, **saving farmers from chemicals**.
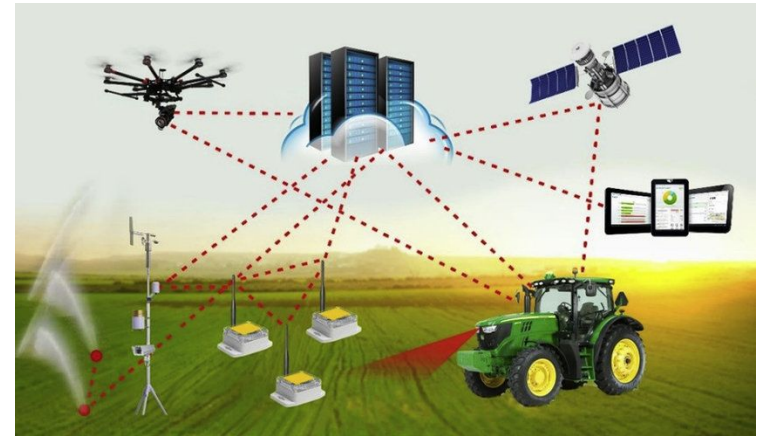
Summary

- Drones in the agriculture industry are the future, which can increase the efficiency of a typical farmer.

- More countries are embracing drones for agriculture to increase productivity.

- Drones have privacy concerns, but it is fine if it works within a predefined boundary.

- Initial cost for setup is high, and they do need maintenance, but overall increase productivity.

- Drones also help in the transportation of goods to those areas which are difficult to maneuver for farmers.

https://www.analyticsinsight.net/apocalypse-or-opportunity-reimaging-the-future-of-drones-robots/

https://www.researchgate.net/figure/e-The-fusion-of-small-and-large-scale-sensor-networks-drones-autonomous-vehicles_fig3_321331354

Thank You!

… Any questions?

jimutbahanpal@yahoo.com