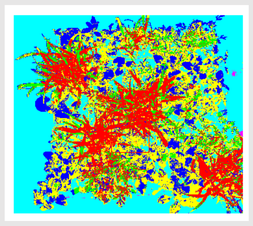
Big-Data Analysis and Collection from Unmanned Aircraft Systems



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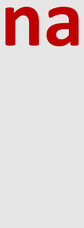
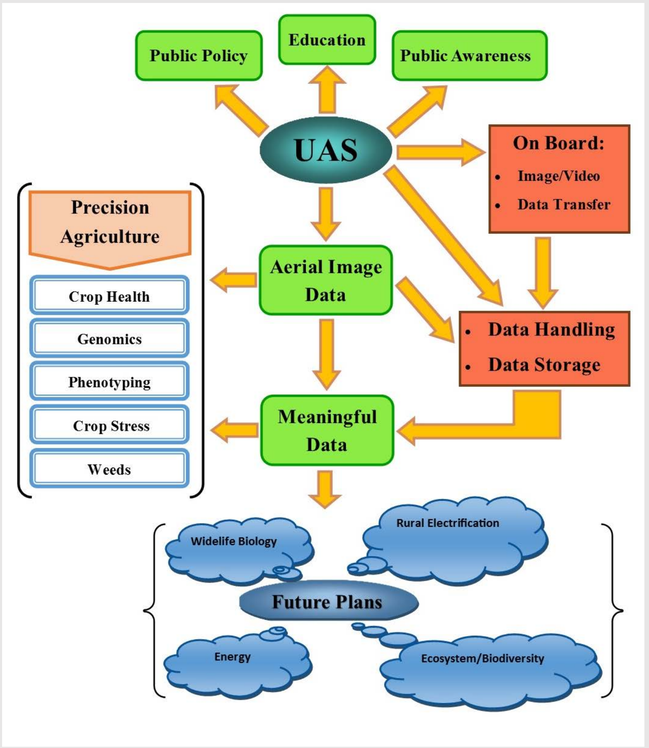
Summary

Information and Data are key in precision agriculture (PA), which involves the technique of applying the right amount of input at right location at the right time to enhance production with positive environment impact. Real time data is important and cost-effective sources of high-resolution data are emerging from the remote sensing using unmanned aircraft systems (UAS). Major sources of data are sensors and aerial imagery. The UAS should have enough payload capacity to support the sensor or camera for the purpose. There are plenty of management issues with large UAS aerial imagery in terms of volume, data transfer, telematics, software availability, storage, security of storing in clouds, end uses besides the legal issues. There is also a need to increase the skilled workforce in this area. This study tried to address to find a solution for data acquisition from UAS and transferring, processing, storing and using them for PA application.

Big-Data Management for Precision Ag

- Data Management
- Telematics
- Big Data Transfer
- Data Storage
- Security





UAS Sensors

Elbit EO/IR

Sentera

Hyperspectral

Thermal

Sony NEX-5R

MicaSense

ADC

Tetracam ADC

Hermes 450

3DR RTF X8

Phantom 3

Altavian

Trimble UX5

RF70 - Troybuilt

Software Used

MATLAB – is a technical computing language with interactive environment that can be used for data visualization and analysis, computation, image processing

ArcGIS - manipulating, management, analysis and modelling of spatially referenced data and presenting in the form of map.

ENVI – digital image processing software used for visualization and analysis of digital imagery.

Agisoft PhotoScan – used for photogrammetric processing of digital images and advanced imaged based 3D modeling.

Cameras

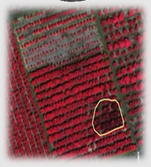
- ICI 9640 S Thermal camera
- Large area scanning EO/IR/NIR camera
- Sony NEX-5R camera with NIR
- Tetracam ADC
- Sentera dual sensor (4 band)
- Sentera Quad sensor (6 band)
- MicaSense Rededge
- Ximera Hyperspectral sensor
- Rikola Hyperspectral sensor?

UAS Platforms

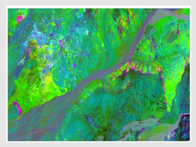
sUAS

Data Link

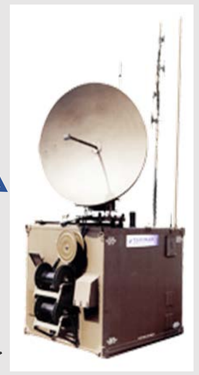
EO/IR/NIR Payload



Large Area Scanning



Hyper Spectral scanning



Ground Control Station

NASA Academy of Aerospace Quality Workshop
Auburn University, Auburn, AL
September 26, 2016

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