



UAS DATA ANALYSIS AND COMPARISON

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Background

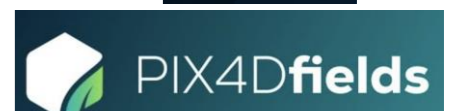
There is currently large amount of opportunity for UAS (unmanned aircraft system) development in precision agriculture. With the use of UAS technologies, it is now possible to map fields, identify plant stress, estimate biomass, manage weeds, count inventory, and spray chemicals while also taking a more integrated and efficient approach to other farming activities using sensing instruments like image devices (RGB, multispectral, hyperspectral, near infrared, RGB depth), grasping tools, or spraying tools. There is a significant amount of data processing required to use these diverse peripherals and sensing devices. Vegetation indices, point clouds, machine learning models, and statistical techniques are often used tools for this processing.

Data Sources

		
DJI Phantom 4		DJI Mini 2
RGB	Multispectral	RGB
72	236	162

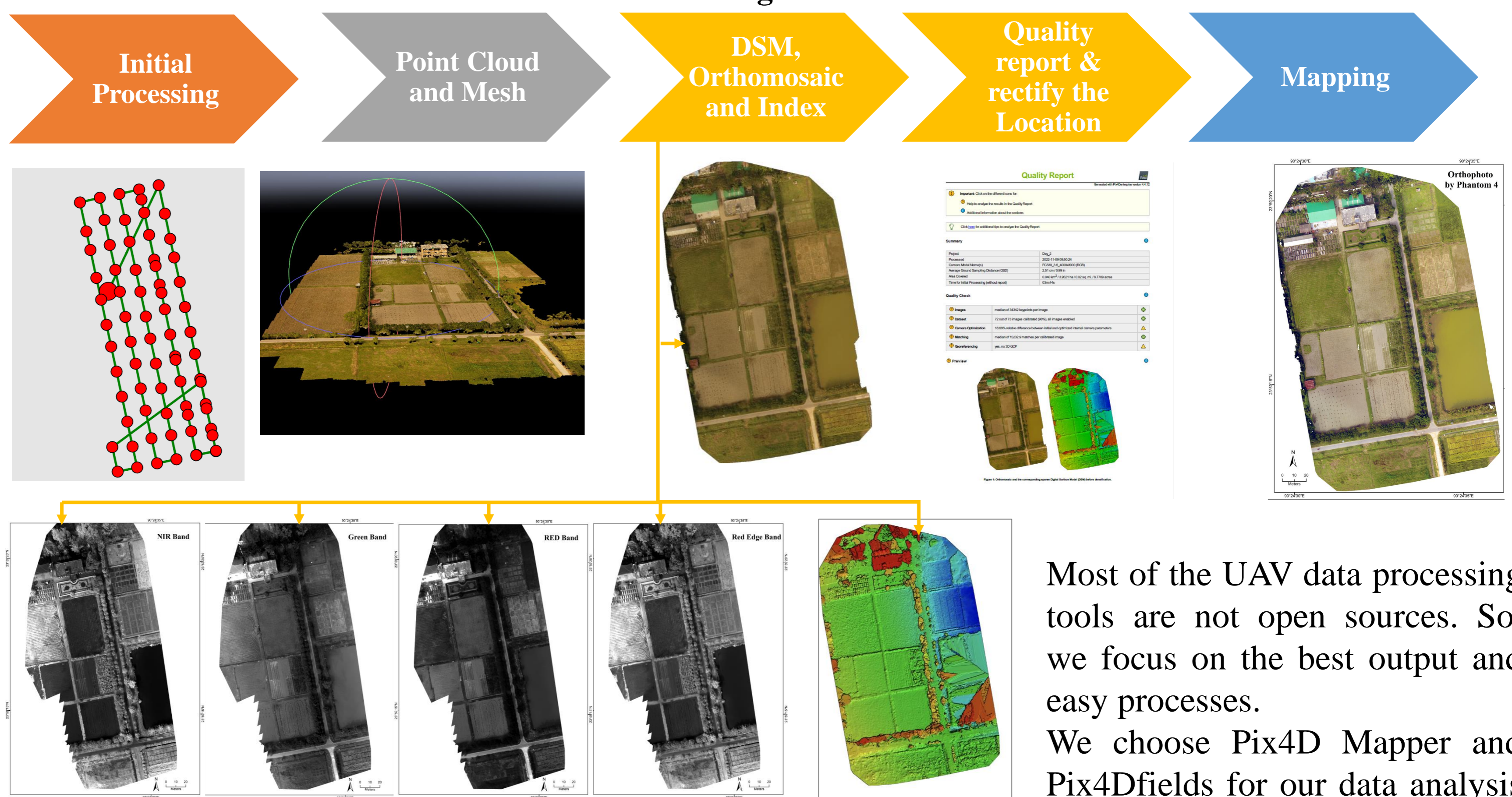
Data Analysis Software

- Pix4DMapper
- PIX4Dfields



UAS Data Processing

Processing One

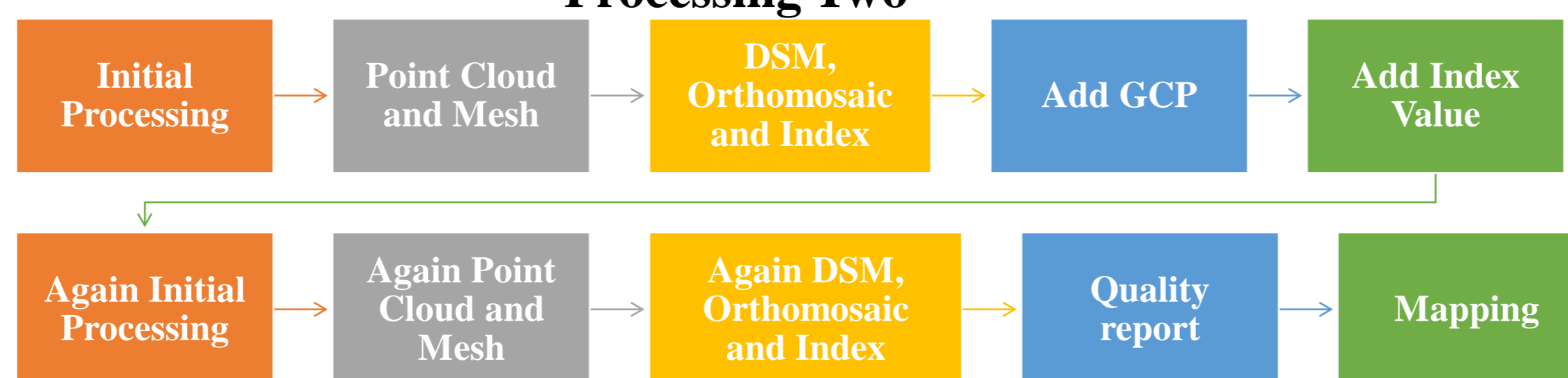


Most of the UAV data processing tools are not open sources. So, we focus on the best output and easy processes.

We choose Pix4D Mapper and Pix4Dfields for our data analysis in this connection.

We used two processes for sensors, such as RGB and multispectral, and field data such as with GCP or without GCP.

Processing Two



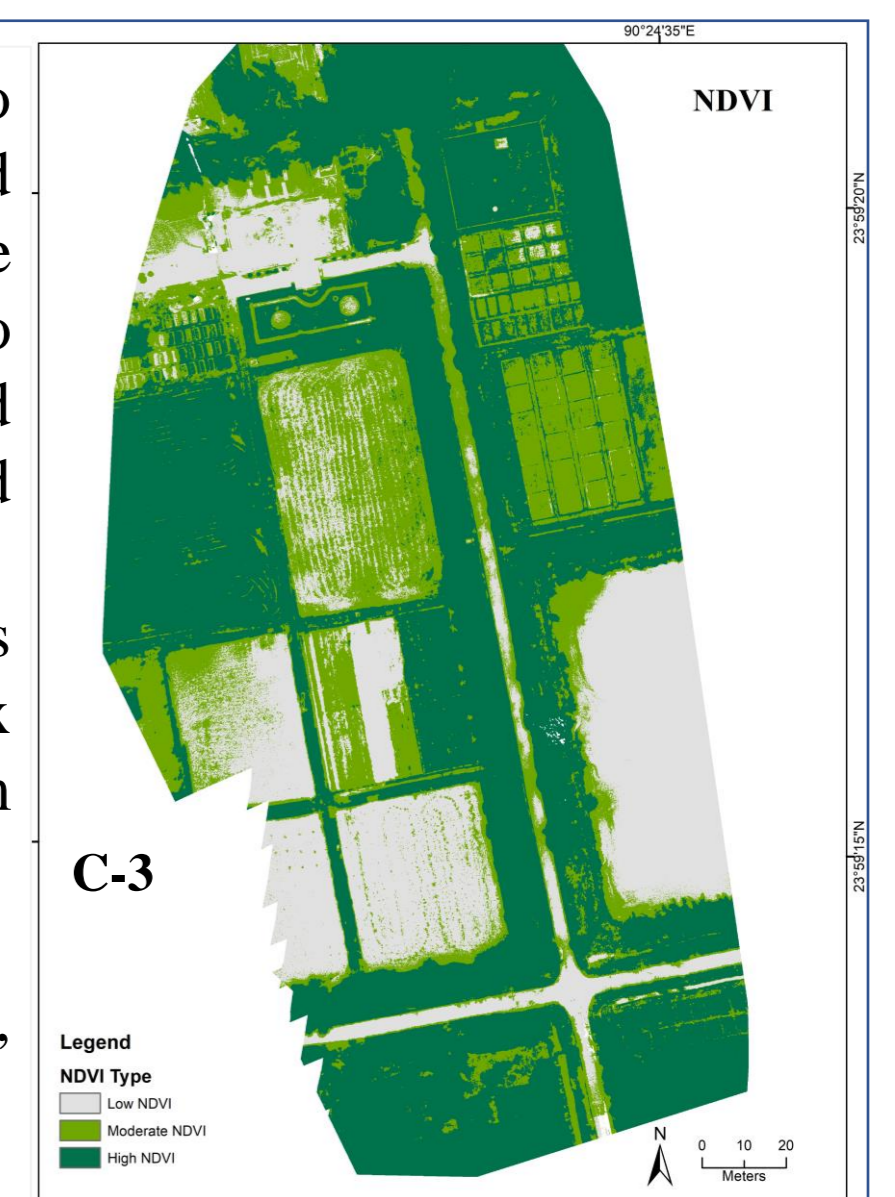
Comparison



We have processed the three datasets (two RGB and one multispectral sensor-based captured data) to compare the quality. We found that the quality of the orthophoto are almost the same, which are captured by Mini 2 and Phantom 4 (figure C-1 and C-2).

Figure C-3 represents the study area's Normalized Difference Vegetation Index (NDVI). The NDVI values range from +1.0 to -1.0.

- Low NDVI means Soil and sand
- Moderate NDVI means Shrubs, grasslands
- High NDVI means such crops or trees



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