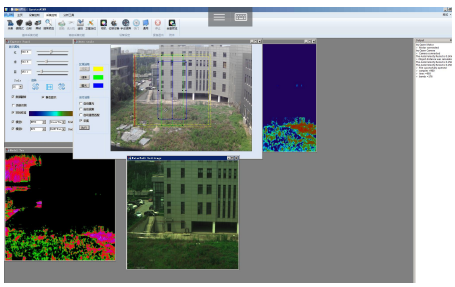
Gaiasky-mini Hyperspectral Imaging Camera



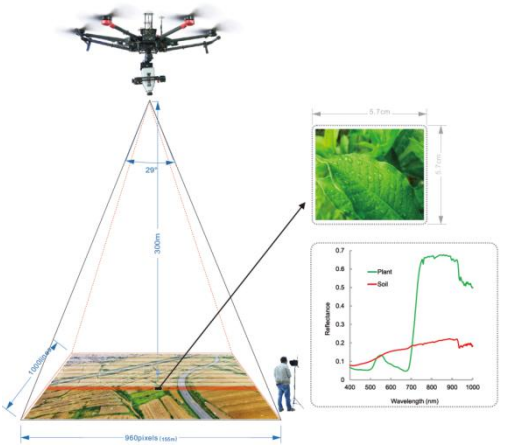
GaiaSky-VIS/NIR camera provide extremely high resolution images by scanning and taking multiple images to construct a hyperspectral datacube. Hyperspectral imaging devices (GaiaSky) for lens scanning obtain slit spectra by projecting a strip of the scene onto a slit and dispersing the slit image with a prism or a grating. In lens scanning, each two-dimensional (2-D) sensor output represents a full slit spectrum (x,λ). The NUC integrated into the system to control system operation ,data acquisition, and analyze , so the spatial dimension is collected through the scanning motor movement.

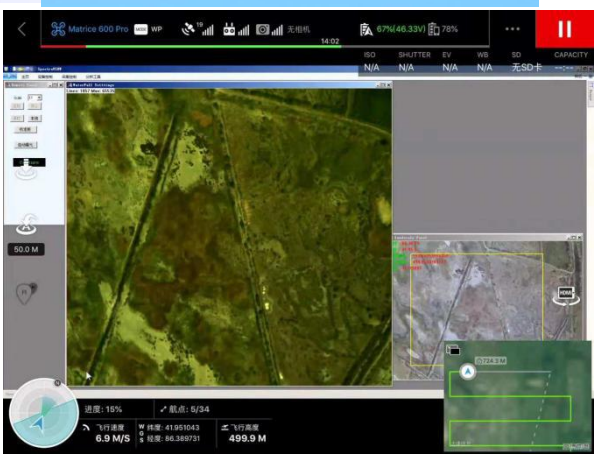
GaiaSky camera connects with DJ UAV, user only need control the UAV by controller fly to the test area and specific height, then the UAV receive the trigger signal from the operator, the system will work and save data to the internal NUC , when finish capture the first point so the UAV can automatically fly to next position which user set before fly until finish the last position collect.

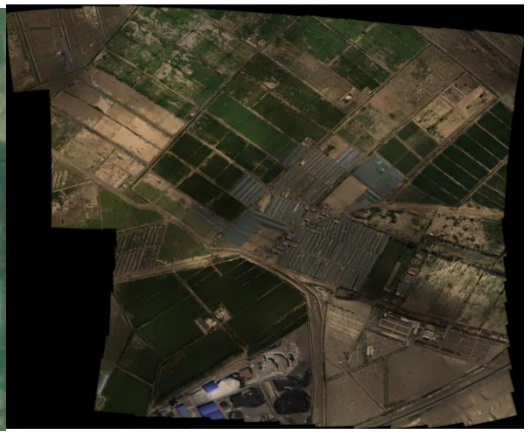
GaiaSkySystem Function:

- Auto exposure time;
- Auto match scanning speed;
- Auxiliary camera (user can observe you want);
- Data analysis (reflectance /radiometric/uniformity/lens/area /atmospheric/calibration)
- Spectra /imaging view and export;
- Spectral Angle matching;
- NDVI(advance custom);
- PCA;
- Supervised classification;
- Support lens change;
- Standard type data (support envi/envice/matlab);
- Images stitching;

GaiaSky-mini


29°
300m
5.7cm
4.1cm
Plant
Soil
Reflectance
Wavelength (nm)
960pixels


Matrice 600 Pro
WP
14:02
ISO
SHUTTER
EV
WB
SD
CAPACITY
N/A
无SD卡
50.0 M
进度: 15%
航点: 5/34
飞行速度
6.9 M/S
飞行高度
499.9 M



2.2.GaiaSky System Parameters

Instrument model	Gaiasky-mini2-VN		Gaiasky-mini-VN		Gaiasky-mini-VN-W	
Spectral Region(nm)	400-1000nm					
Spectral resolution	3.5nm					
Numerical Aperture	F/2.8					
Spectral channel number	0.5nm		0.7nm		0.7nm	
Pixels	1936 x 1456		1392 x 1040		1392 x 1040	
Pixel pitch	4.54um		6.45um		6.45um	
Digital OutPut	14(bit)					
Signal Connector	USB 3.0		USB 2.0		USB2.0	
Power	12~19V					
Power Consumption	45W					
Carrying platform	DJI M600 Pro					
lens	18.5mm， 23mm					
(FOVac，°)	26.7@18.5mm,21.5@23mm		27.3@18.5mm,22.08@23mm		27.3@18.5mm,22.08@23mm	
The transverse view	142M@18.5mm, 115M@23mm(Flight altitude 300M)		146M@18.5mm, 117M@23mm(Flight altitude 300M)		146M@18.5mm, 117M@23mm(Flight altitude 300M)	
Ingle image resolution	1920X2080(1X), 960X1040(2X)		1392X1400(1X), 696X700(2X)		None	
Spectral channel number	1440(1X)，720(2X)，360(4X)，176(8X)		1040(1X)，520(2X)，256(4X)，128(8X)		1040(1X)，520(2X)，256(4X)，128(8X)	
Spatial resolution	0.118(@23mm,Height 300m)		0.168(@23mm, ,Height 300m)		0.168(@23mm, ,Height 300m)	
Scanning speed (line images/s)	125(360)	160(176channel)	60(360channel)	84(176channel)	60(360channel)	84(176channel
Single shotspeed (s)	9@360channel	7@176channel	13@360channel	9@176channel	None	
Weight	1.5kg				1kg	
Memory	240G SSD(512G,1T Optional)					

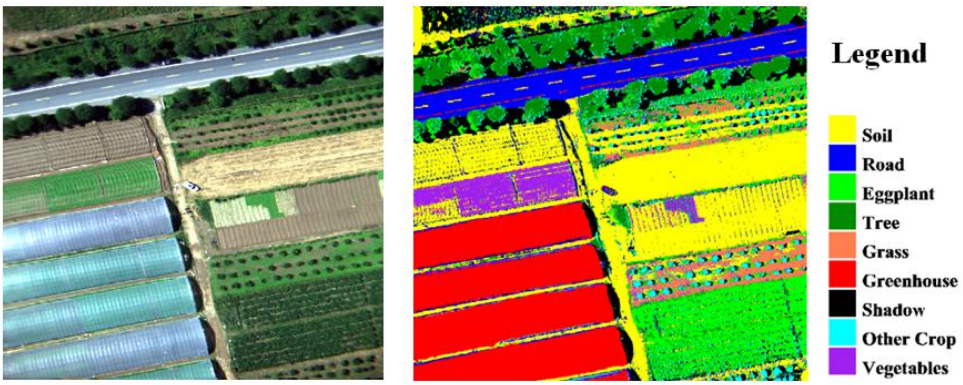
GaiaSky System Apply:

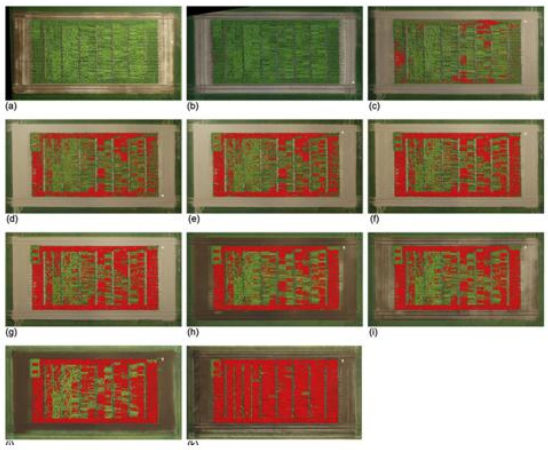
There are many applications which can take advantage of hyperspectral imaging.

- Environmental: water quality monitoring,atmospheric monitoring of the Marine environment
- Agricultural: plant disease feature classification agricultural census
- Military: anti-camouflage
- Geological research: mineral exploration, basic geological survey, soil quality survey

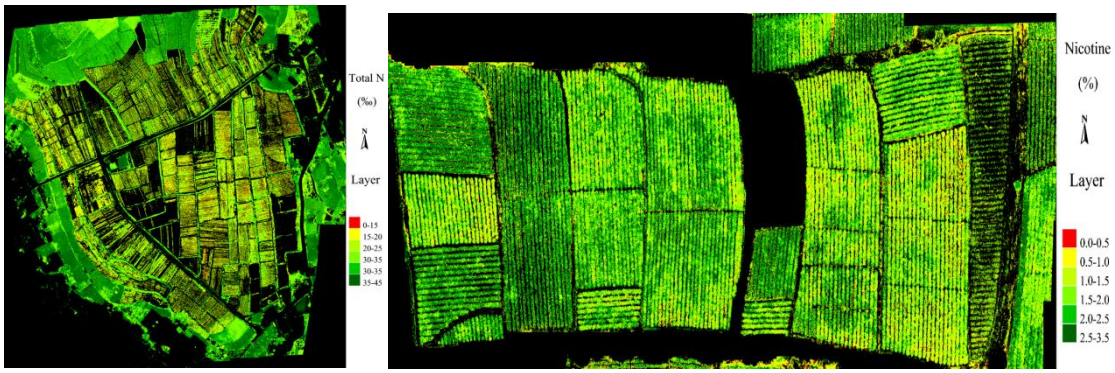
Agricultural:

The application of hyperspectral in agricultural field is the most extensive and a relatively mature.It has a wide and far-reaching application prospect in the detection of crop growth classification diseases and insect pests and the investigation of forestry resources.The spectral characteristics of vegetation mainly depend on the chlorophyll content and composition in the leaves. Normally growing plants have typical spectral shapes.



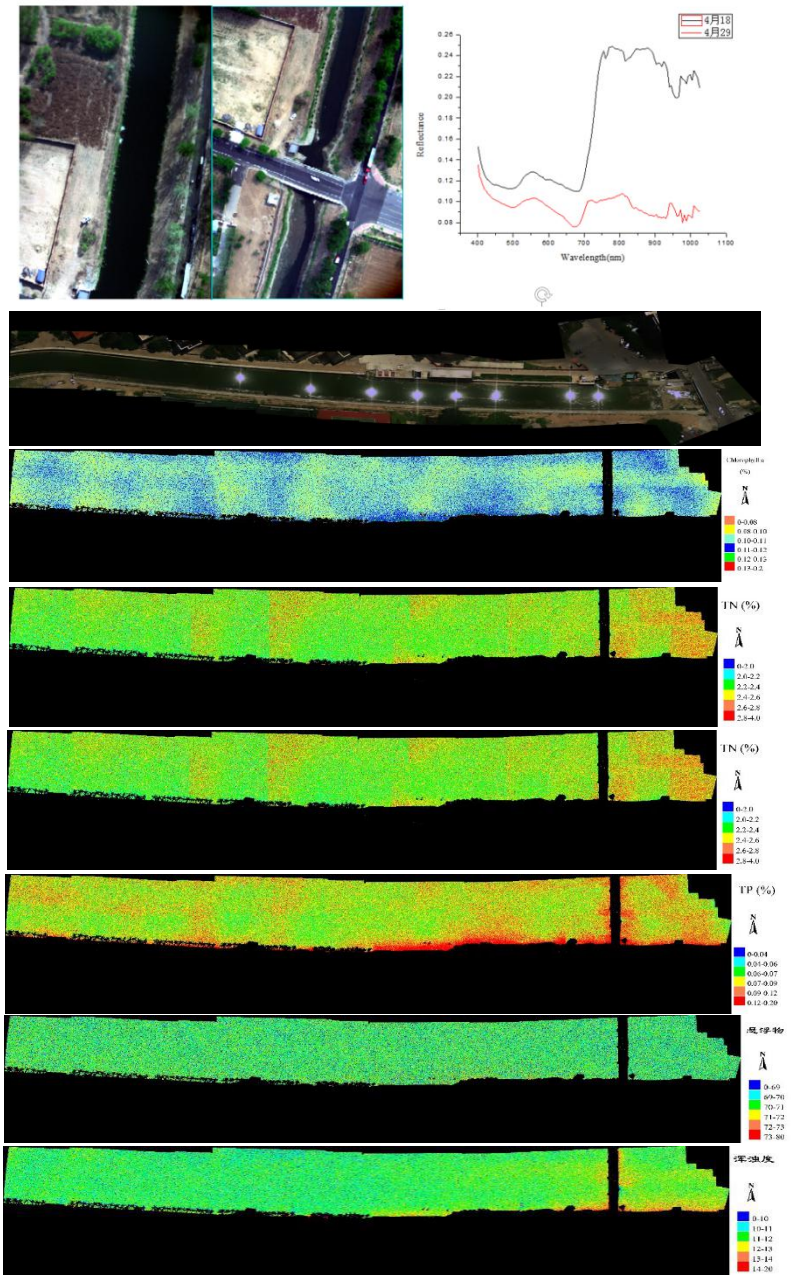


Progress of potato damage from late blight development over time. The red overlay shows damaged parts detected by image processing on (a) 7/17, (b) 7/18, (c) 7/23, (d) 7/25, (e) 7/26, (f) 7/27, (g) 7/30, (h) 8/2, (i) 8/3, (j) 8/7 and (k) 8/15.



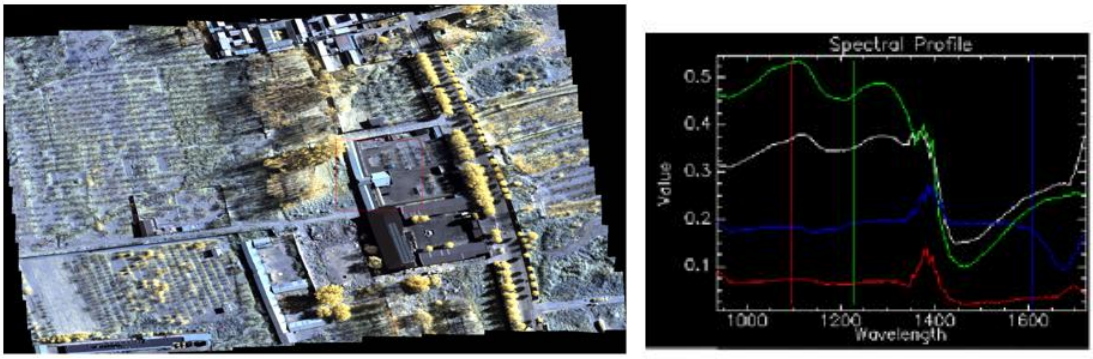
Environmental:

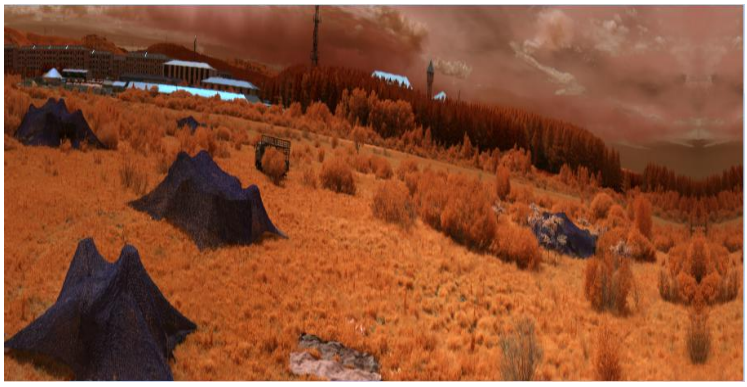
The environment is becoming more and more prominent in modern society, but the traditional environmental monitoring methods cannot get the results quickly and in real time and the process is complicated.The spectral technology can effectively identify the sediment content and pollution concentration of water body and has unique effect on the investigation and monitoring of environmental problems.

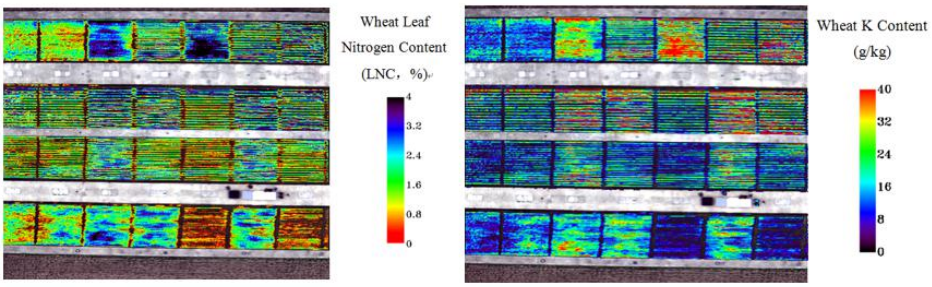


Military:

In the military field is mainly in the near infrared and infrared spectral band.Gaiasky-mini2nir is very good at detecting camouflage.





Geological research

Rock and mineral geological structure identification is an important application field of imaging hyperspectral system in geological exploration.Hyperspectral imaging technology also provides more abundant data for land survey and evaluation, which is of great significance to the management of land resource.