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Expertise : Field geology and regional tectonics, satellite aerial remote sensing applications, surface action and natural disasters, environmental geology and geothermal exploration, synthetic aperture radar interferometry.

RCEC Principal Research: Applying Satellite Remote Sensing Technology to Evaluate Energy Saving Benefits

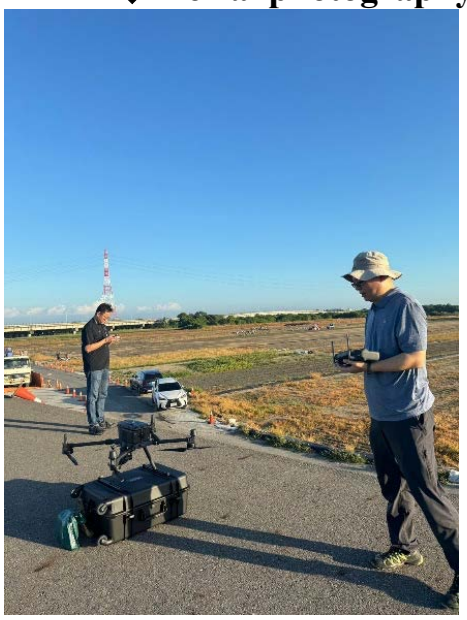
RCEC Research Goals:

(1) Integration of drone carrier and thermal imaging system;

(2) Completion of more than 10 full-day measurements in conjunction with multi-spectral measurement.

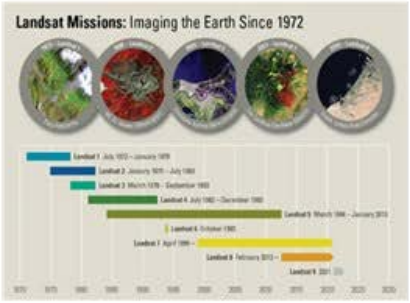
(3) Obtaining image data of building shells and asphalt pavement to verify the cooling performance.

◆ Aerial photography of operationson 4 July 2024 ◆



Research Methods and Applications

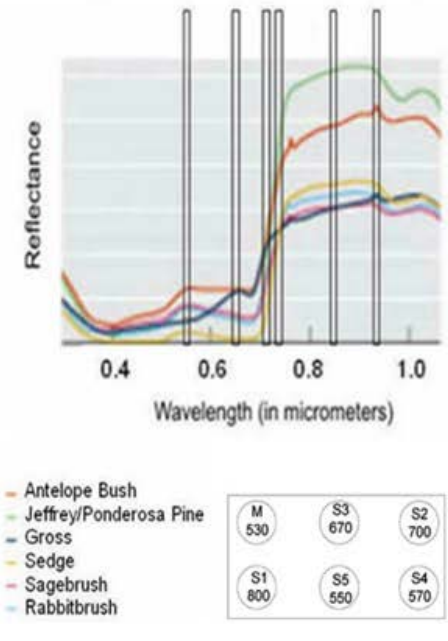
Landsat 8/9 satellite data



波段	光譜區域	波長 (μm)	解析度 (m)
Band 1	Visible Coastal Aerosol (海岸/氣膠)	0.433-0.453	30
Band 2	Visible Blue (可見光-藍)	0.450-0.515	30
Band 3	Visible Green (可見光-綠)	0.525-0.600	30
Band 4	Visible Red (可見光-紅)	0.630-0.680	30
Band 5	Near-Infrared (近紅外光)	0.845-0.885	30
Band 6	SWIR 1 (中紅外光)	1.560-1.660	30
Band 7	SWIR 2 (中紅外光)	2.100-2.300	30
Band 8	Panchromatic PAN (全色波段)	0.500-0.680	15
Band 9	Cirrus (卷雲段)	1.360-1.390	30
Band 10	**TIRS 1 (熱紅外光)**	**10.60-11.19**	**100**
Band 11	**TIRS 2 (熱紅外光)**	**11.50-12.51**	**100**

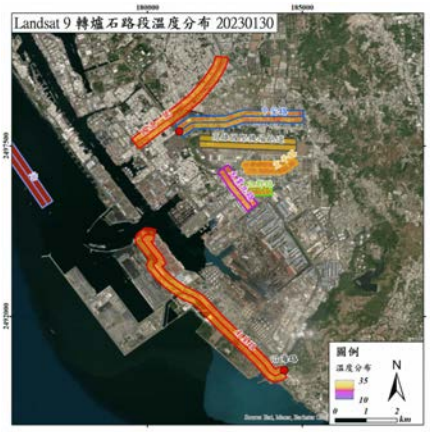
UAV multispectral data

UAV thermal imagery

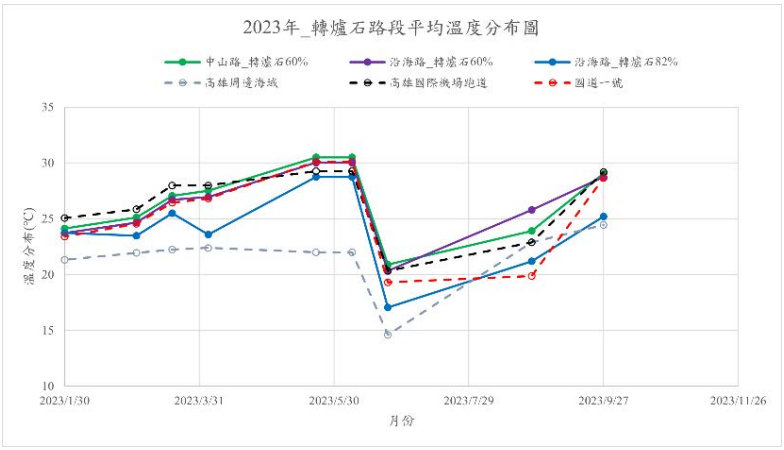


Dimensions	19 mm lens: 123.7×112.6×127.1 mm
Weight	19 mm lens: 588 g
Gimbal	
Angular Vibration Range	±0.01°
Mount	Detachable
Controllable Range	Tilt: +30° to -90°, Pan: ±320°
Mechanical Range	Tilt: +45° to -130°, Pan: ±330°, Roll: -90° to +60°
Max Controllable Speed	Tilt: 90°/s, Pan: 90°/s
Camera (Thermal)	
Thermal Imager	Uncooled VOx Microbolometer
FPA/ Digital Video Display Formats	640×512; 336×256
Digital Zoom	640×512: 1x, 2x, 4x, 8x; 336×256: 1x, 2x, 4x
Pixel Pitch	17 μm
Spectral Band	7.5-13.5 μm
Full Frame Rates	30 Hz
Exportable Frame Rates	<9 Hz
Sensitivity (NEdT)	<50 mk @ f/1.0
Scene Range (High Gain)	640×512: -25° to 135℃
Scene Range (Low Gain)	-40° to 550℃
File Storage	microSD card
Photo Format	JPEG, TIFF, R-JPEG
Video Format	8 bit: MOV, MP4
14 bit: TIFF Sequence	SEQ

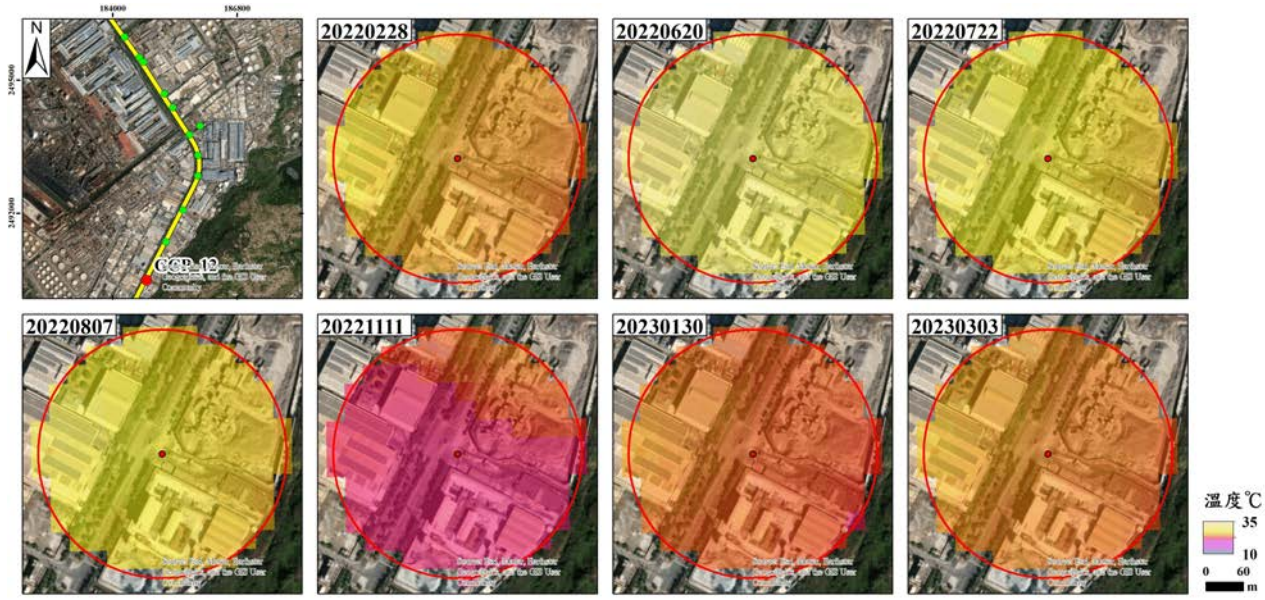
Related Research Highlights



Landsat 9 Satellite Temperature Time Series Analysis



Analyses of the temperatures of the converter section by time period s in 2023



Time-series variation of temperature around each GNSS control point.