

Supplementary Information

A Dragonfly-Inspired Heterogeneous Sensing System for Task-Driven Multi-Modal Perception

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Supplementary Note 1. Experimental configuration

The indoor L-shaped hallway experiment used co-located panoramic vision, LiDAR and monostatic THz measurements at the same sensing positions. Supplementary Table 1 summarizes the acquisition configuration.

Supplementary Table 1: Experimental specifications of the multi-modal sensing system.

Parameter	Value
General configuration	
Scenario	Indoor L-shaped hallway
Number of sensing positions	16
Inter-position spacing	1.5 m
Sensor platform height	2 m
THz configuration	
Frequency band	290-310 GHz
Bandwidth	20 GHz
Number of frequency points	8001
Delay resolution	0.05 ns
Azimuth scanning range	$[0^\circ : 5^\circ : 355^\circ]$
Elevation scanning range	$[-20^\circ : 5^\circ : 20^\circ]$
Antenna gain of Tx/Rx	26 dBi
HPBW of Tx/Rx antennas	8°
LiDAR configuration	
LiDAR model	Livox HAP (TX)
LiDAR viewing orientations	0° , 120° , and 240°
FoV per scan	120° horizontal, 25° vertical
Point rate	452,000 points/s
Distance accuracy	< 3 cm system error at 20 m
Angular random error	$< 0.1^\circ$
Vision configuration	
Camera model	QooCam 8K fisheye panoramic camera
Image type	RGB equirectangular panoramic image
Image resolution	7680×3840 pixels
Data type	RGB image matrix