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Supplemental Material

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Supplementary Materials

Performance evaluation of a smart mobile air temperature and humidity sensor for characterizing intra-city thermal environment

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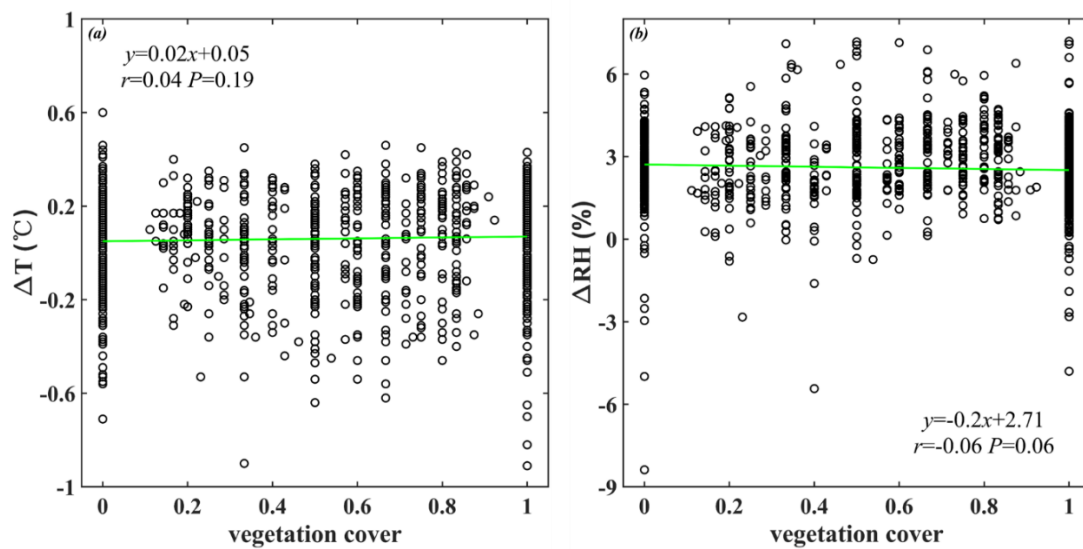


Figure S1. Relationship between vegetation cover fraction (10 m buffer radius) and difference in air temperature (a) and relative humidity (b) between Smart-T and I-Met. Also shown are regression line, regression equation, linear correlation coefficient (r) and confidence level (P).

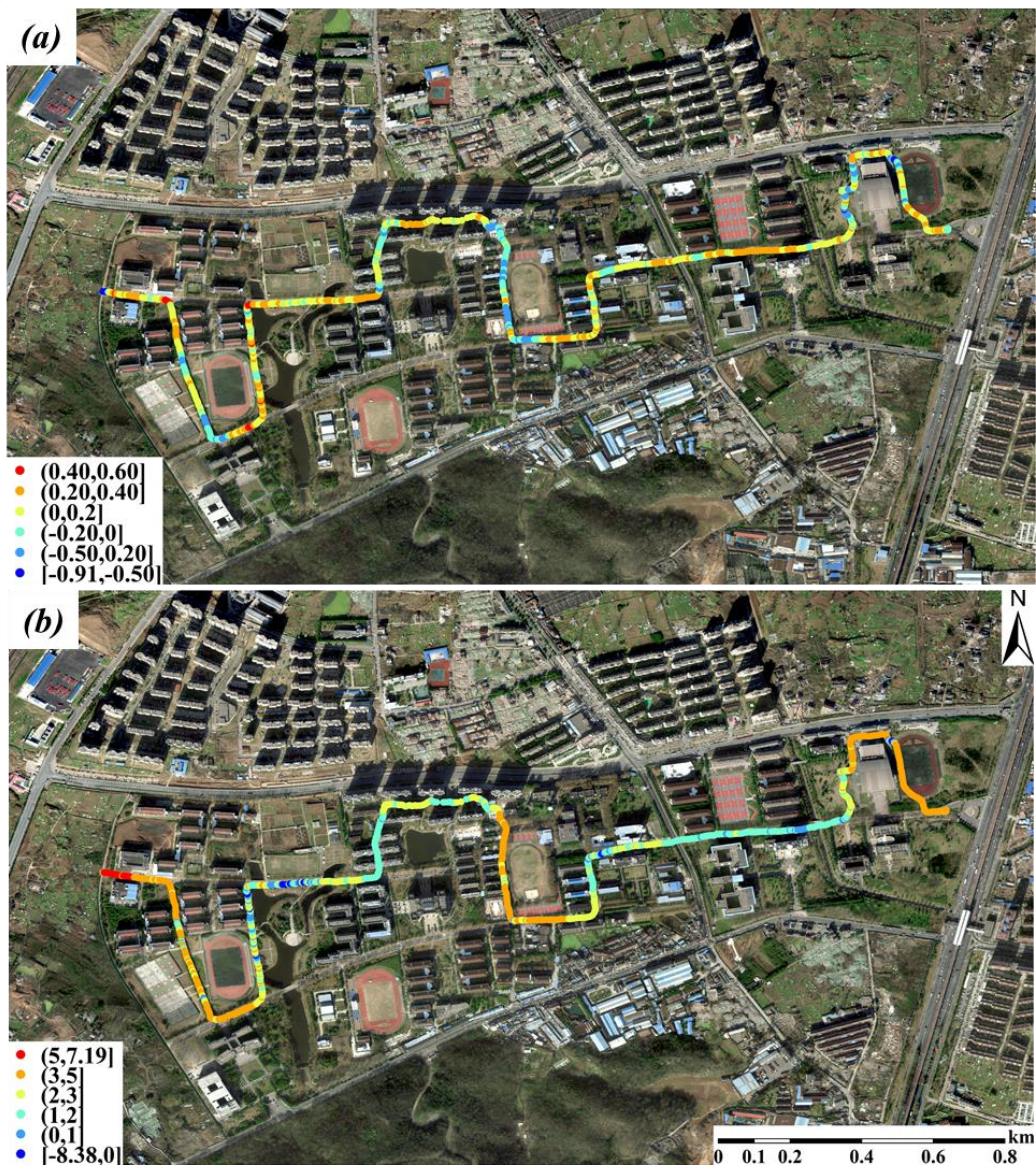


Figure S2. Spatial pattern of difference in air temperature (a) and relative humidity (b) between Smart-T and I-Met.

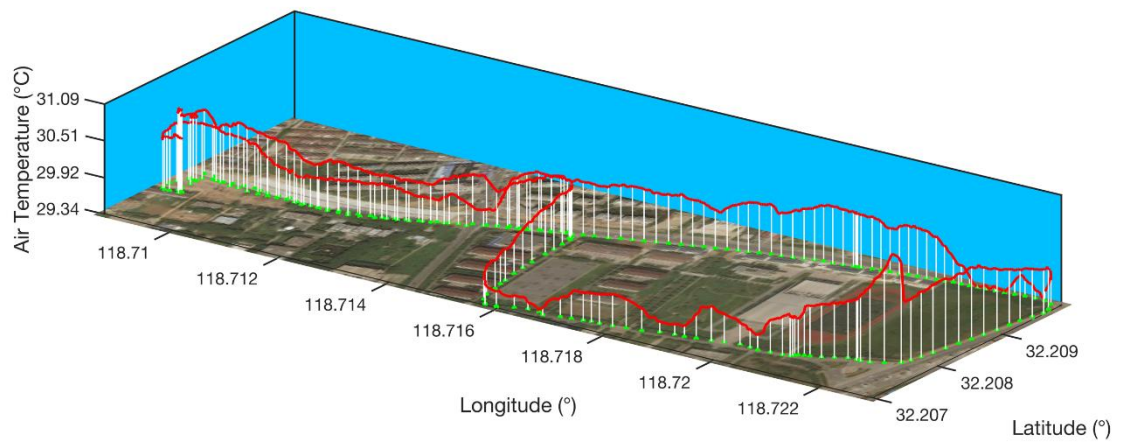
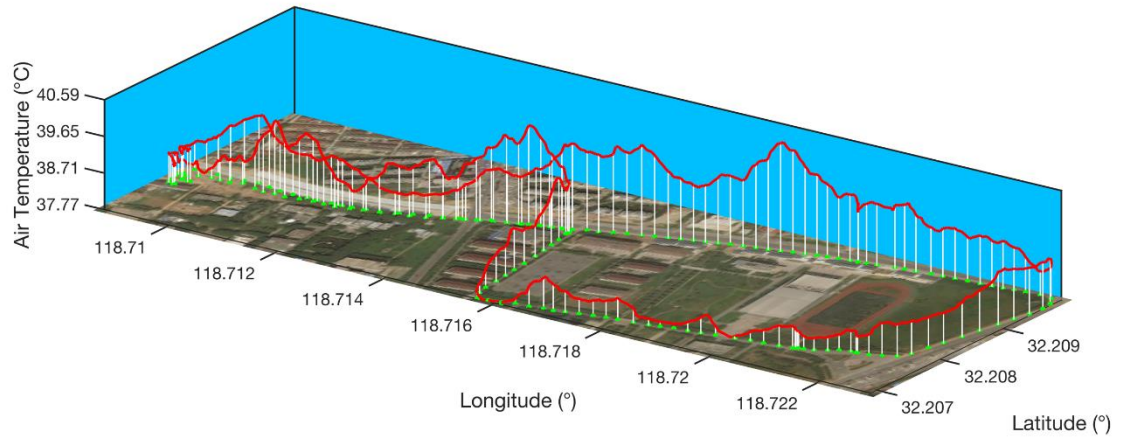


Figure S3. Three-dimensional visualization of the temperature transect data: top panel, 14:00 July 31; bottom panel, 22:00 July 31.

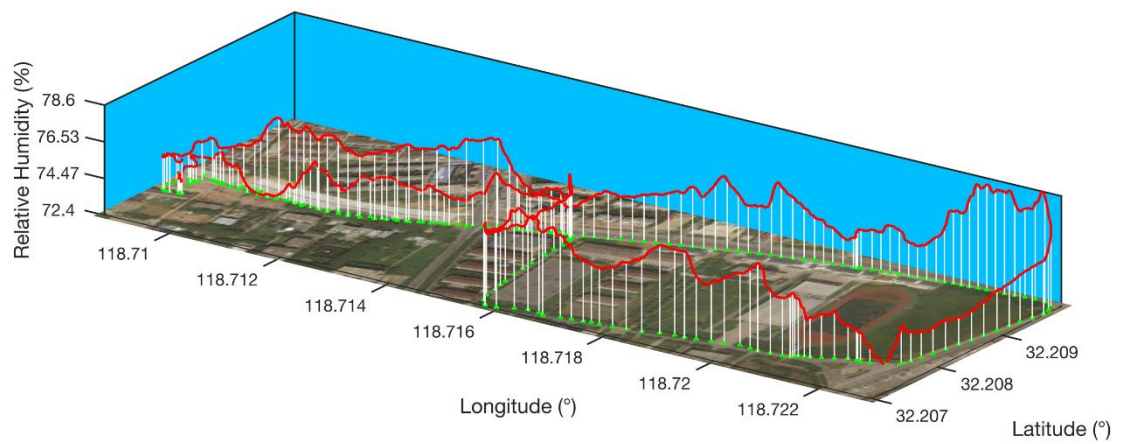
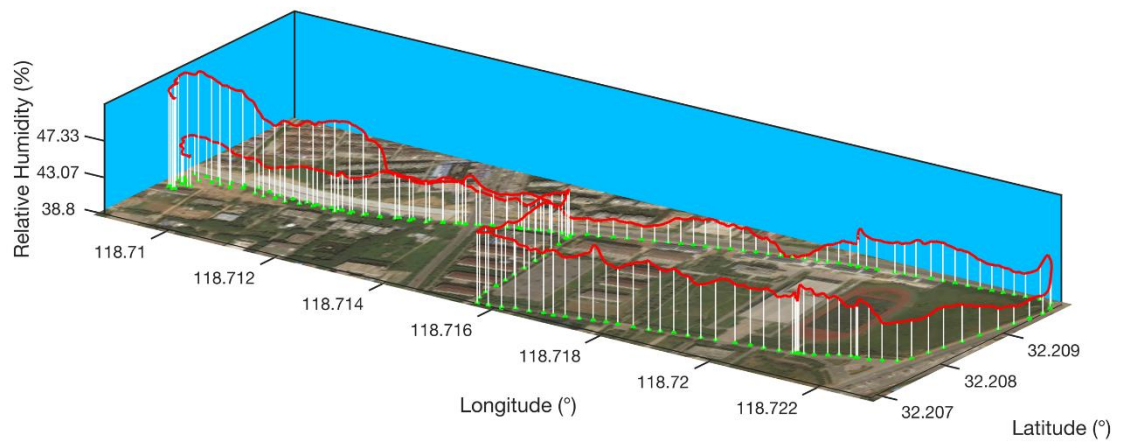


Figure S4. Three-dimensional visualization of the relative humidity transect data: top panel, 14:00 July 31; bottom panel, 22:00 July 31.

Table S1. Accuracy of sensors used in published mobile and (stationary) distributed measurements.

Sensor type	Temperature (°C)	RH (%)	Reference
Bicycle-mounted			
Smart-T	-0.01 to 0.23 (>29 °C); 0.23 to 0.48 (-20 to 29 °C)	-1.4 to 1.9	This study
Campbell Scientific 109SS	±0.1	/	Ziter et al., 2019
HOBO U23-002	±0.21	±2.5	Liu et al., 2017
Campbell Scientific CS215L	0.4	2.0 (10-90) 4 (<10 or >90)	Heusinkveld et al., 2014
Ecolog TH1 combisensor of temperature and humidity	±0.2	±1.5	Brandsma and Wolters, 2012
Platinum resistance	±0.15	/	Yokoyama et al., 2018
Car-mounted			
TESTO™ 480 thermometer & humidity and temperature probe Ø 12mm	±0.3	±2	Shi et al., 2018
PT 100 sensor	±0.2	/	Leconte et al., 2017
Type T fine-wire thermocouple	±0.5	/	Makido et al., 2016; Voelkel and Shandas, 2017; Shandas et al., 2019
TR-72U	±0.21	-	Qaid et al., 2016
Thermo-hygrometer	±0.1	±1.5 (5-95) ±2 (<5 or >95)	Noro et al., 2015
PT 100	±0.2	/	Leconte et al., 2015
TR-72U Thermo Recorder	±0.3	±5	Sun et al., 2009 & 2011
Ceramic wound resistance temperature detector	±0.15	/	Hart and Sailor, 2009
Carried by pedestrians			
Thermochron iButton	±1	/	Kuras et al., 2015; Sugg et al., 2018; Runkle et al., 2019
BME280	±0.5	±3	Pigliatile and Pisello, 2018
Met One 064-2 temperature sensor	±0.1	/	Tsin et al., 2016
Q-Trak 8552 (TSI Inc.)	±0.6	±3.0	Schwarz et al., 2012
Spatially-distributed			
Thermo-hygrometer	±0.3	±2.5	Yokoyama et al., 2018
HOBO Pro v2 temp/RH	±0.3	±5	Qaid et al., 2016
OPUS10 TIC	±0.3	±2.5	Schwarz et al., 2012
Aginova Sentinel Micro (ASM) air temperature sensors	±0.22	/	Young et al., 2014; Warren et al., 2016
iButton thermometer/hygrometer	0.5	5.0	Scott et al., 2017

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