

Developing user profiles for mixed-mode office buildings operation based on occupant behaviour evaluation

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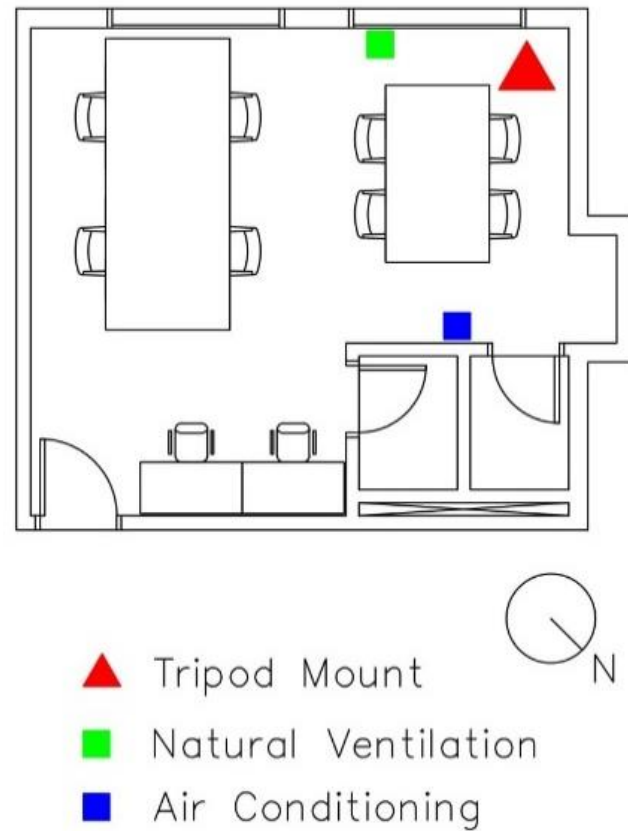
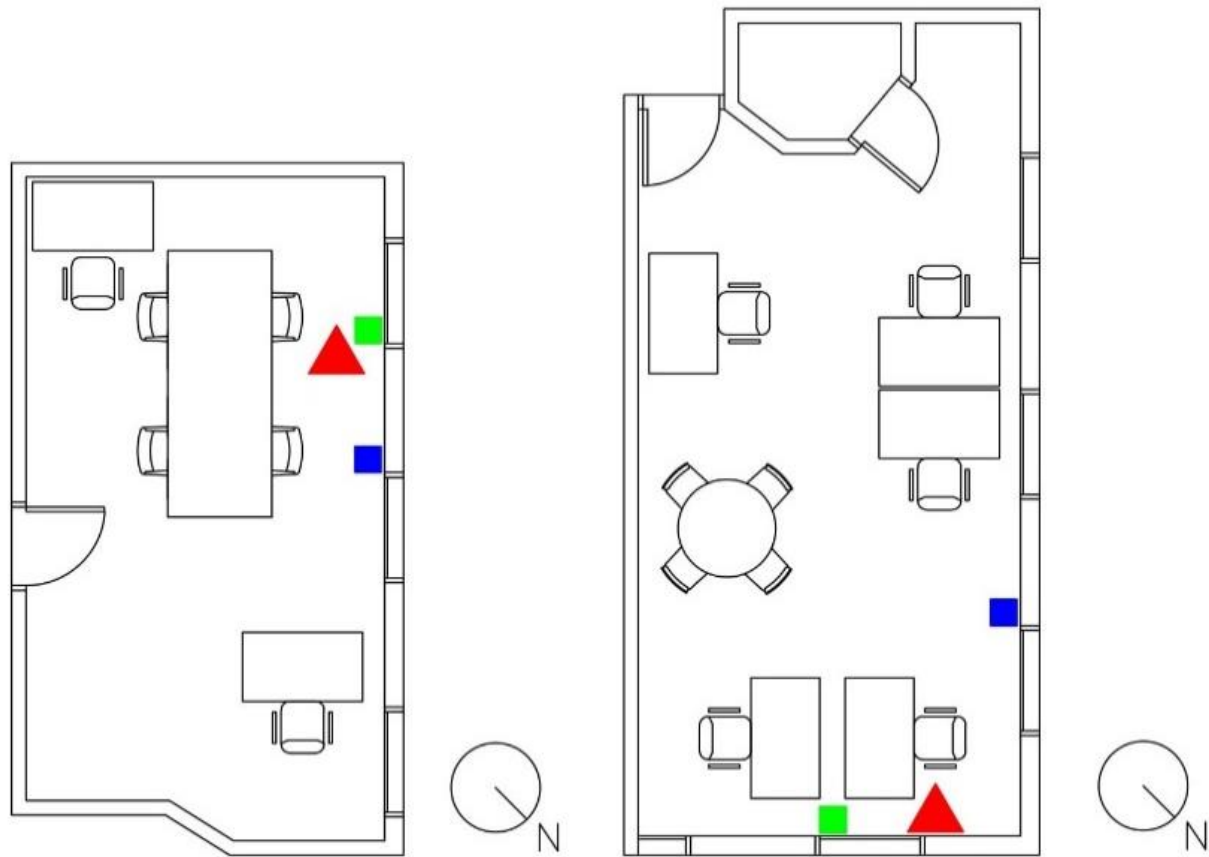


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Research method: field studies

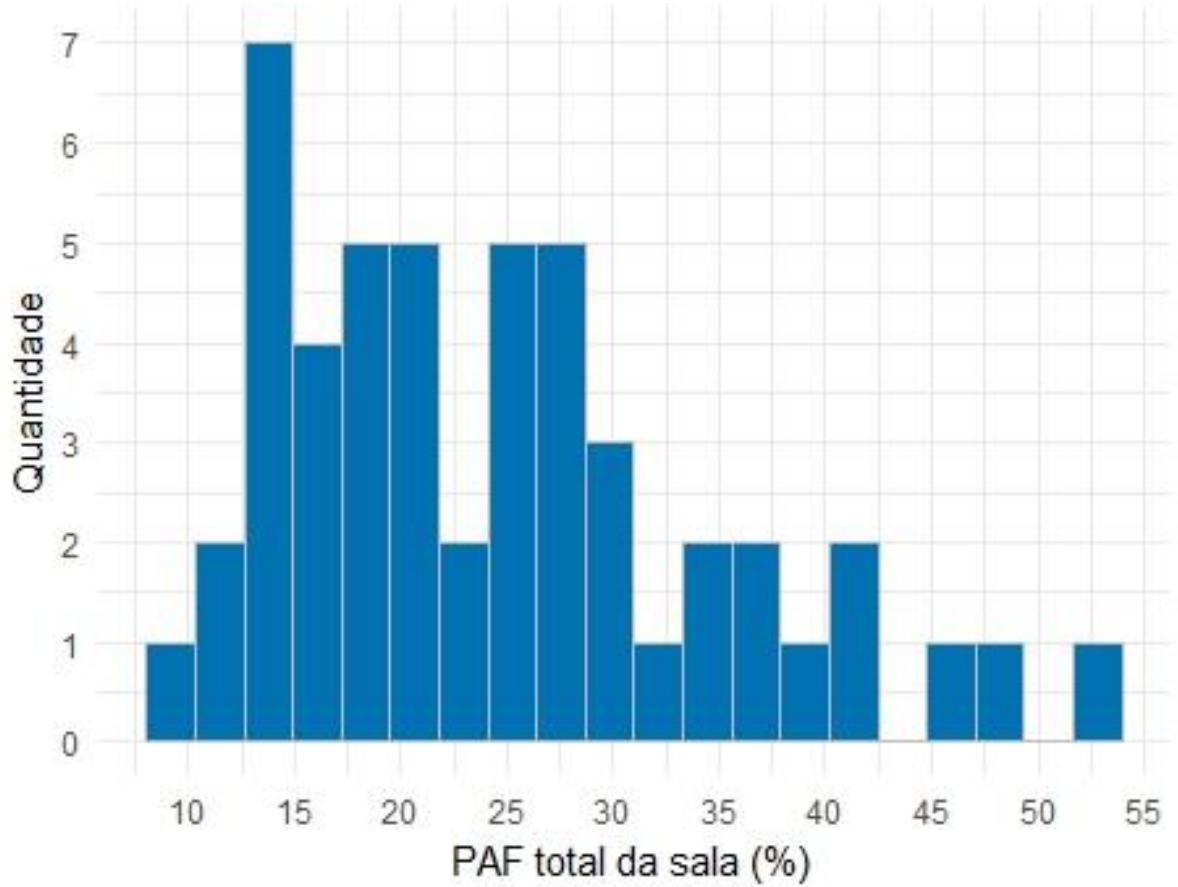
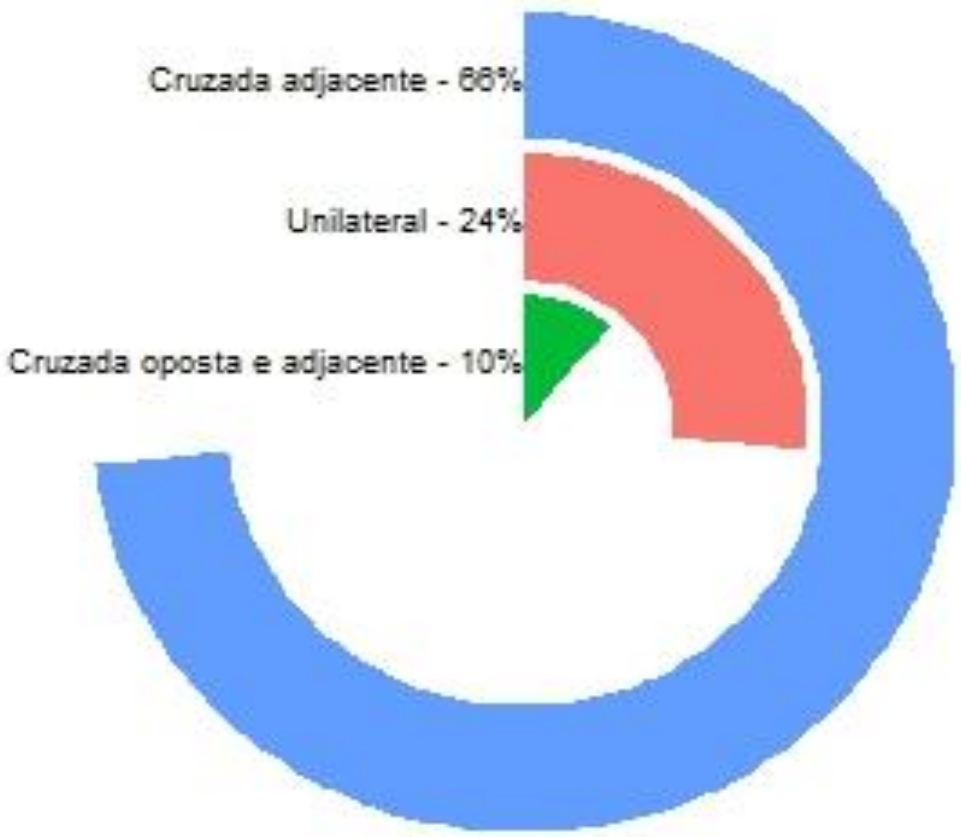


São Paulo
humid subtropical climate
latitude 23°32'S



- ✓ Environmental and user control variables taken in situ
- ✓ Subjective data collected from questionnaires

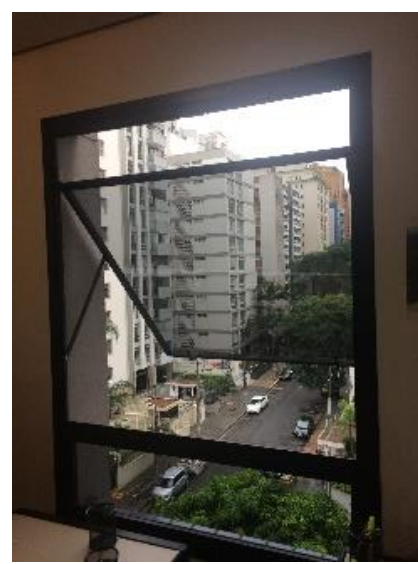
Database analysis



Measurements of physical parameters

Field studies were carried out from April (autumn) to October (spring) 2017:

- ✓ Air temperature
- ✓ Radiant temperature
- ✓ Air velocity
- ✓ Relative humidity
- ✓ Manual operation of the air-conditioning system
- ✓ Manual operation of the natural ventilation system

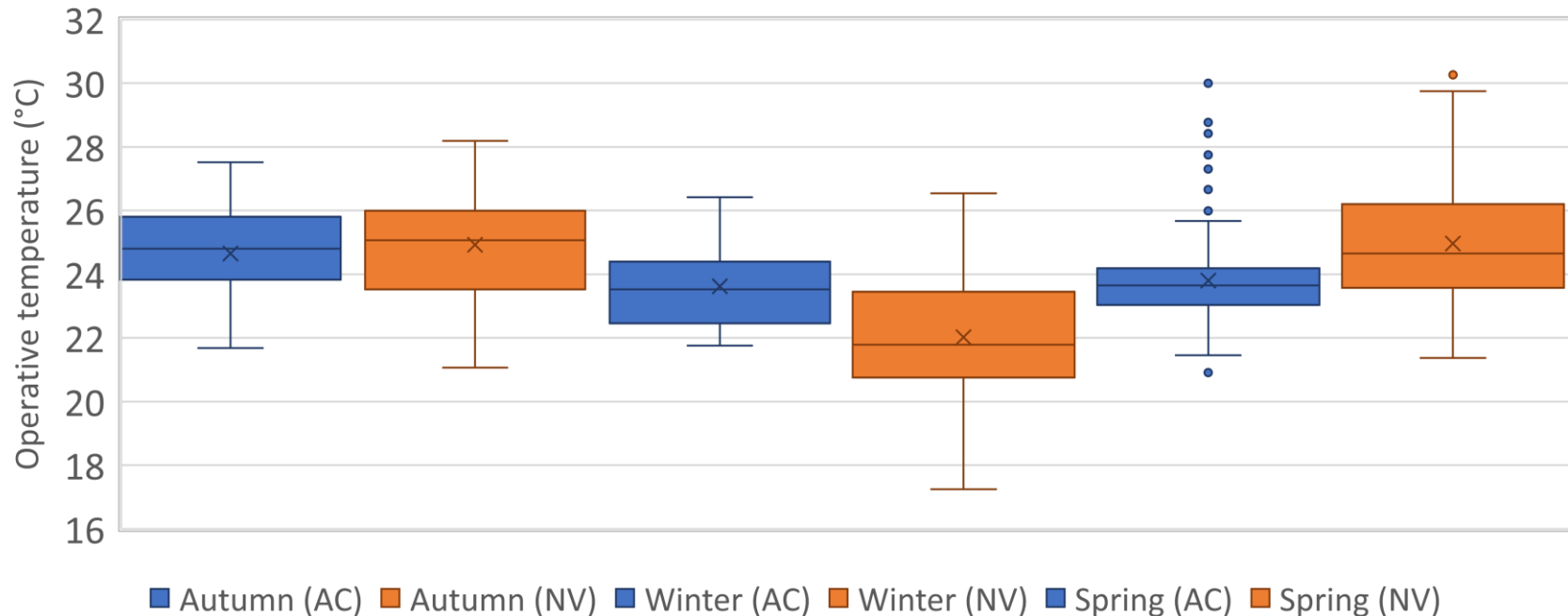


Results

Statistical summary of indoor and outdoor climatic conditions

Parameter	AC period (number of hourly data = 176)				NV period (number of hourly data = 126)				Combined data	
	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD
DBT (°C)	23.9	1.3	21.1	30.2	23.1	2.0	18.8	28.3	23.6	1.7
MRT (°C)	23.8	1.3	20.7	29.8	23.3	2.2	18.7	29.3	23.6	1.7
Top (°C)	23.8	1.3	20.9	30.0	23.2	2.1	18.7	28.8	23.6	1.7
RH (%)	46.3	7.8	32.4	66.5	61.5	9.0	44.9	76.7	52.6	11.2
Tout (°C)	25.3	5.0	13.2	34.6	19.1	4.1	10.6	28.8	22.7	5.6

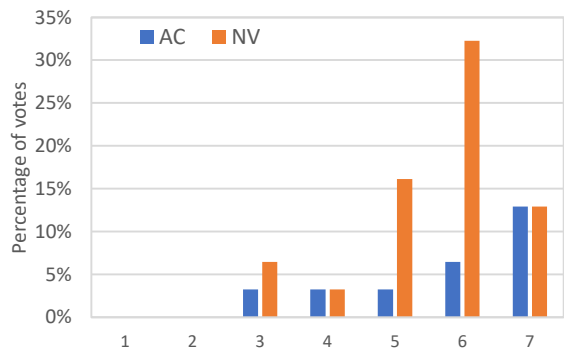
Box plot of operative temperature for AC and NV periods



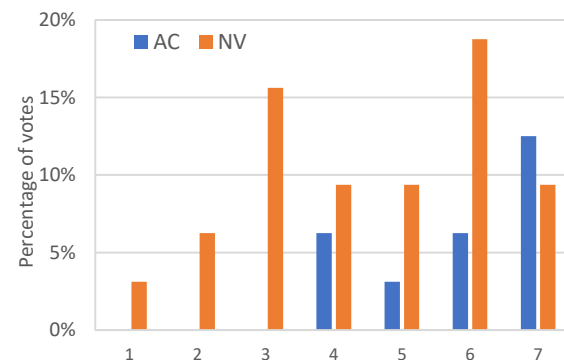
Results

Statistical summary of static and adaptive models thermal comfort calculations

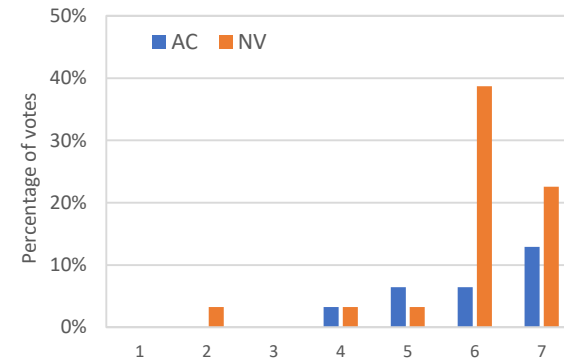
Season	Parameter	AC period (number of hourly data = 176)			NV period (number of hourly data = 126)		
		% of compliance with ASHRAE 55-2013	Mean	SD	% of compliance with ASHRAE 55-2013	Mean	SD
Autumn	Static model (PMV)	64	0.17	0.53	14	0.88	0.31
	Adaptive model (Top)	93	24.6	1.6	79	26.5	1.1
Winter	Static model (PMV)	60	0.45	0.28	67	0.29	0.31
	Adaptive model (Top)	100	23.6	1.3	98	22.5	1.5
Spring	Static model (PMV)	90	-0.07	0.36	77	0.33	0.50
	Adaptive model (Top)	98	23.8	1.3	85	25.0	1.9



Noise

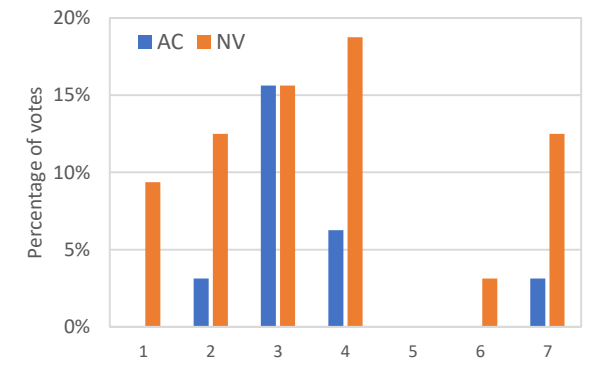


air pollution



odour

Questionnaire responses



glare

1 (unsatisfactory) ----- 7 (satisfactory)

THANK YOU!
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