Smart Campus indoor climate dataset

Indoor air-quality, presence and light measurements from the University of Oulu Linnanmaa-campus and botanical garden are published at fairdata.fi.

The dataset begins on 1.7.2020. Read more about our open data releases.

'application' and 'lora' .csv-tables

The data is split into two tables, 'application' and 'lora', the former containing a numeric representation of the physical quantities under measurement, and the latter containing values exposed by our LoRa-gateway, including metrics such as signal strength.

A month of this .csv formatted data consumes around 100 MiB's of memory, however the files are distributed in a compressed archive.

Sensors and measurements

The network consists of 429 deployed sensors. Each of which transmit once every 15 minutes.

The following quantities are included in the 'application'-table.

Description	Column name	Unit	Only in
Air temperature	temperature	[°C]	
Relative humidity	humidity	[% RH]	
Light	light	(linear index)	
Passive infrared	motion	(linear index, pir)	
Co2	co2	[ppm]	ers-co2
Battery voltage	battery	[V]	
Average SPL	sound_avg	[dB]	ers-sound
Peak SPL	sound_peak	[dB]	ers-sound
Soil moisture	moisture	[%]	elt-2-with-soil-moisture
Atmospheric	pressure	[bar]	elt-2-with-soil-moisture
Acceleration (X)	acceleration_x	[g]	elt-2-with-soil-moisture
Acceleration (Y)	acceleration_y	[g]	elt-2-with-soil-moisture
Acceleration (Z)	acceleration_z	[g]	elt-2-with-soil-moisture

Data from three different kinds of sensors are combined. Some quantites are only measured by some sensors, as indicated by the 'Only in' column above. Latest information on sensor accuracy can be found from the vendors datasheets.

This format is similar to the Prelude data format.

Sensor metadata

devices.jsonl uses the jsonlines-format. It contains metadata about individual sensor devices, including the geolocation (Web Mercator EPSG:3785) and spoken description of installation location.

Time format

The time format of the 'time'-column is epoch milliseconds (example in python):

```python
example = 1596240013479


import time

time.gmtime(example / 1000)
# time.struct_time(tm_year=2020, tm_mon=8, ...)

time.localtime(example / 1000)
# time.struct_time(tm_year=2020, tm_mon=8, ...)


from datetime import datetime as dt

dt.fromtimestamp(example / 1000)
# datetime.datetime(2020, 8, 1, 3, 0, 13, 479000)
```

Issue: missing .csv headers

Affecting	release-2021062800
Fixed by	release-2021062801

On 22.3.2022 it was brought to our attention that the initial release is missing .csv headers. A fix was implemented by releasing this data again, now including the expected headers.