



# Intra-urban thermal variability with low-cost sensors: an application for Prato city

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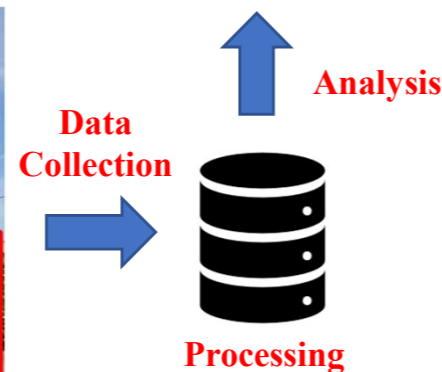
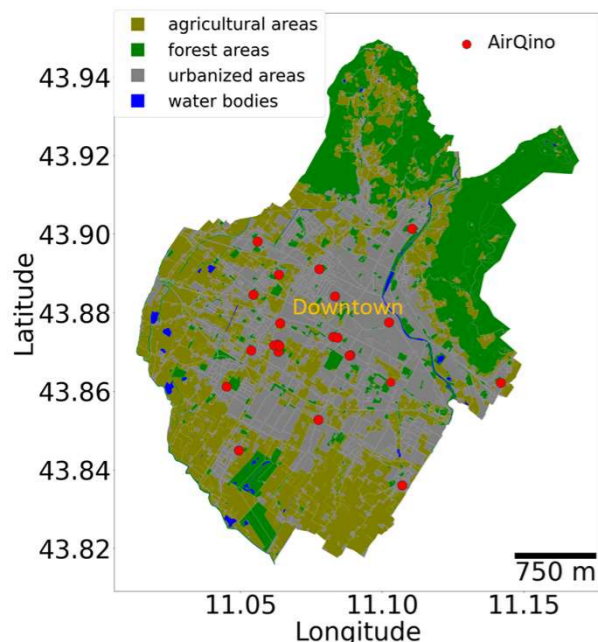
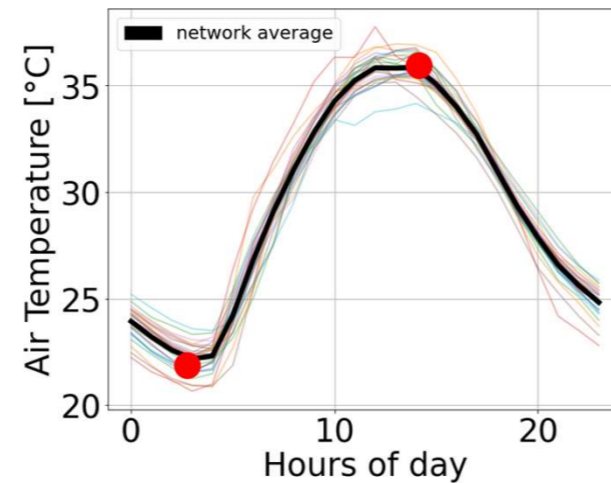


## 1. Introduction

The quantification of heat distribution in urban environments is a relevant topic, since global warming trend is exacerbating Urban Heat Island (UHI) and the related health risks. Thermal patterns can be mapped through various approaches. In support of future investigations, this work shows the spatial distribution of air-temperature for the city of Prato by means of a network of low-cost sensors deployed in the area.

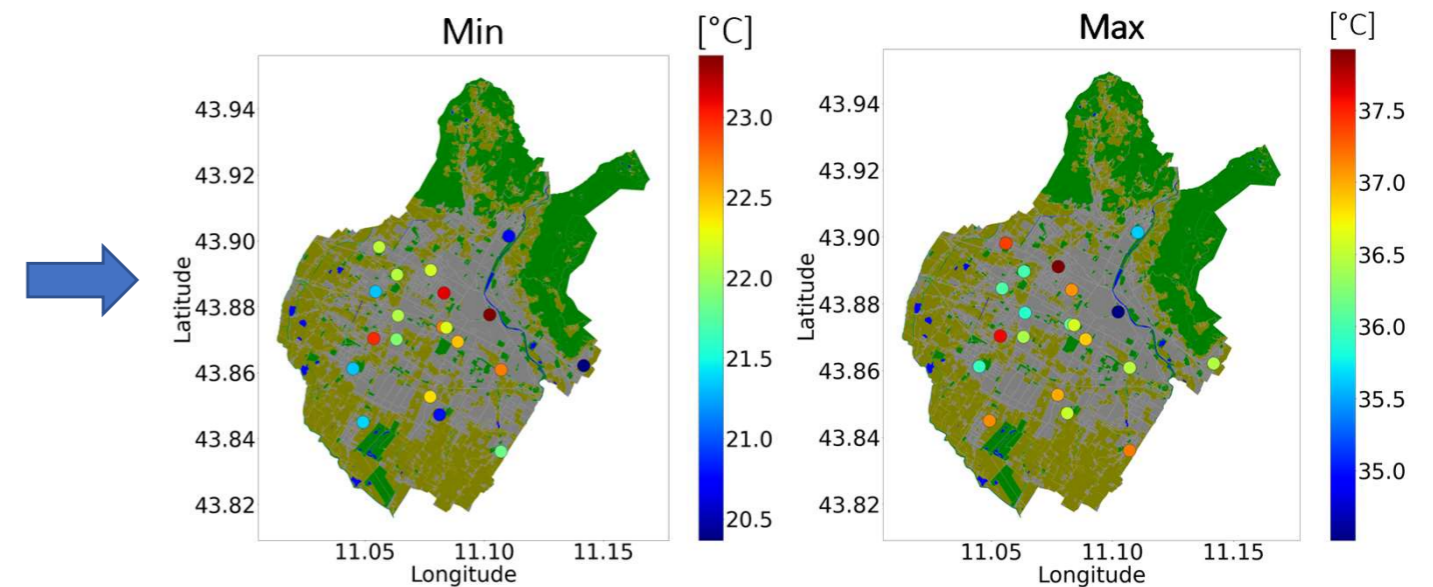
## 2. Study area and data

- Municipality of Prato, Tuscany, Italy (43°52'48"N, 11°05'54"E).
- Network of 30 low-cost sensors "AirQino".
- Computation of the diurnal thermal pattern at network level for July 2022.
- Selection of the hours with maximum and minimum temperatures and assessment of the spatial variability.



## 3. Temperature patterns

- The highest average temperature was generally detected at 2pm (35.8°C), the lowest at 3am (22.2 °C);
- Minimum temperatures were primarily higher in the downtown (strongly urbanized area), lower in the peri-urban and rural areas;
- Maximum temperatures were distributed differently, with high values both in downtown and suburbs;
- Interestingly, the coldest site of the maximum temperatures in the downtown area is the warmest for the minimum;



## 4. Future work

- Link the observations acquired from the ground sensors with data of different type.
- Quantify robustly the UHI and its effects.
- Investigate the most vulnerable areas of Prato and evaluate and simulate mitigation strategies.

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