CLIMATE DETECTIVES 2020 – 2021

INVESTIGATION OF AIR QUALITY AND METEOROLOGICAL

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RESEARCH QUESTION

Atmospheric quality in urban areas is one of the most important issues related to air pollution. Meteorological parameters have a significant role in air quality. Can we collect data using sensors in a

SUMMARY OF PROJECT

This project aims to create a network of low-cost sensors that will send the collected data through a variety microcontrollers to a central database. At the beginning of this project we used a variety of boards like Raspberry Pi, Arduino, ESP32 etc. We compared these boards in terms of accuracy and operability and we figured out that the most appropriate in order to build this network of sensors in ESP32. The sensors used to measure humidity, temperature, carbon monoxide and methane. The created network can either fixed in a specific area of each school/ institution but also in students houses so that will be formed per city and per country can create a huge data network making spatial distribution to record all parameters. The data collected during the project's lifetime will make a significant contribution to this effort, while at the same time, through the proposed network of school sensors and pollution recorders, primary and secondary education students will be trained in collecting and utilizing scientific data, while gaining an environmental consciousness and transferring it to their families, the local community around their school and gradually to the wider community.

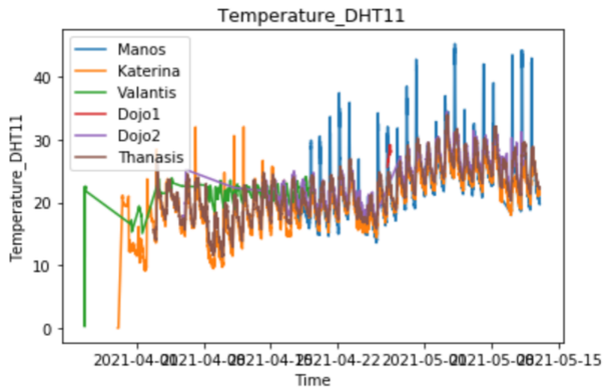

Figure 1: This figure presents the temperature diagrams of all devices for almost two months. The sensors

MAIN RESULTS

Pollutants are measured on a continuous basis throughout the 24 hour period, the response time of the automatic analyzers is about one minute. So, in our project each sensor gives a value about every five minutes and the value is the average of five minutes data. Average hourly pollution values are calculated every hour. These values are uploaded through an application on the mobile phone. In this way it is possible to monitor the levels of air pollution in this area. The sensors recorded some upper levels of humidity due to the sea and generaly work properly

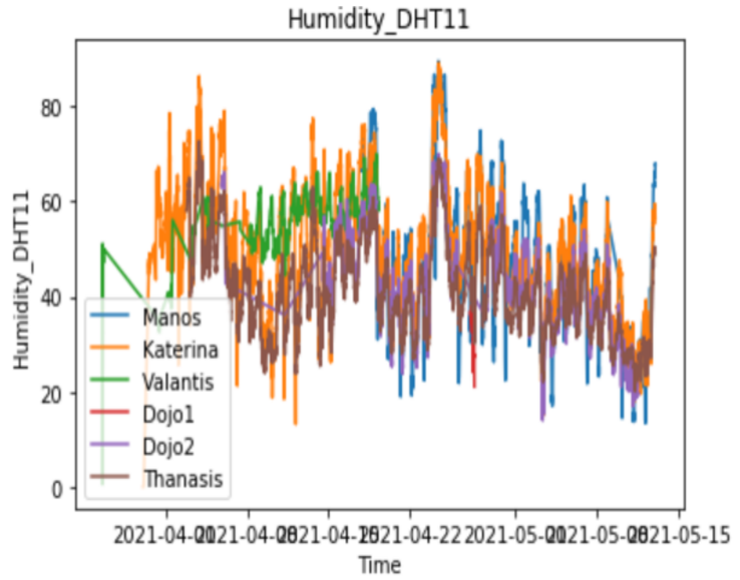

Figure 2: This figure presents the humidity diagrams of all devices for almost two months. The sensors recorded some upper levels of humidity due to the sea and generaly work properly

ACTIONS TO HELP LESSEN TO THE PROBLEM

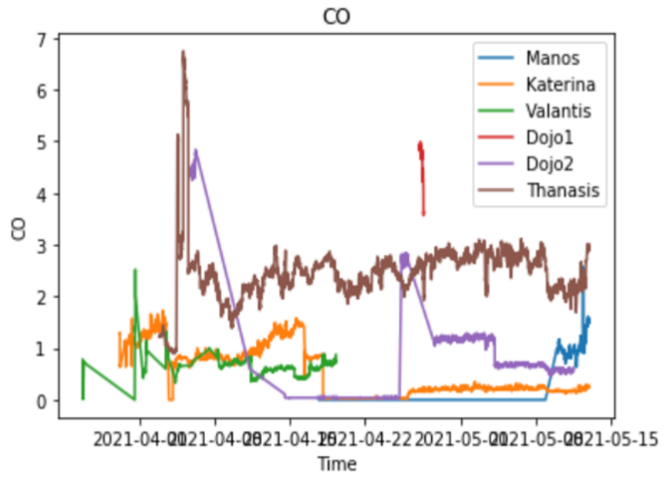

Figure 3: This figure presents the CO diagrams of all devices for almost two months. The sensors recorded some upper levels of CO when heat events

Recycling household waste is a simple move with significant positive consequences.
Through recycling, the products can be reused in a new form.
The "green" balconies and terraces can give another aesthetic to the concrete cities. All we have to do is plant from a flower to a vegetable in a small pot, so that our city can breathe again!
Limiting the use of private cars we can reduce these pollutants that are harmful to our health.
Pollutants released from the use of heating systems, both in winter and in summer, burden the air quality of large urban centers. We can reduce them significantly as long as we change some of our habits. During the winter we could set the thermostat to 18 to 19 degrees Celsius instead of 22 and 23 and avoid opening and closing doors and windows unnecessarily.
Finally, a simple but important move is to replace simple light bulbs with energy-saving light bulbs. In this way we can achieve a reduction in energy consumption of up to 80%!
It is up to us to improve the environment in which we live. Just change some of our daily habits. The biggest problem is found in large urban centers where most of the population of each country is concentrated. We can reverse this picture as long as each of us reflects on the environmental impact of what we are accustomed to doing. Every movement, no matter how small it seems, countspositive