



Chart Writing Manual

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What is LWFS?

The Local Weather Forecasting System (LWFS) is an innovative project combining both hardware and software to provide real-time weather data. Unlike conventional weather apps, LWFS offers accurate, local, and live data, collected directly from your immediate surroundings. This system is housed inside a portable LWFS station and can display key weather metrics such as temperature, humidity, and atmospheric pressure.

How is it Made?

Hardware Components:

1. Arduino UNO: The brain of the system, responsible for collecting data from sensors.
2. BMP 180: Used to measure atmospheric pressure.
3. DHT 11: Measures temperature and humidity.
4. Jumper Wires: Connects various components for data flow.

Software Components:

1. Server.py: A Python script that fetches the data from the Arduino's .ino file and hosts it locally on ipofcomp:500.
2. Frontend HTML Website: Fetches and presents the data from the sensors on a user-friendly interface.

How it Works?

1. Data Collection: Sensors (BMP 180 and DHT 11) gather real-time information on temperature, humidity, and atmospheric pressure.
2. Data Processing: The Arduino UNO processes and stores this data.
3. Data Hosting: The server.py script retrieves the data from the Arduino and hosts it on a local server.
4. Display: Users connected to the same network can access the LWFS website, where the weather data is presented along with additional calculations for better insights.

Benefits Over Traditional Systems:

1. **Real-Time Data:** Unlike weather apps that use remote or outdated data, LWFS provides live readings from your immediate location.
2. **Cost-Effective:** LWFS offers an affordable solution compared to expensive weather stations or unreliable thermometers.
3. **Portable and Scalable:** Compact and easy to carry, it can be set up anywhere.
4. **Customizable:** It can be expanded with features like automatic fans to regulate temperature during high heat.

Drawbacks (and How They Can Be Solved):

1. **Limited Access:** Currently, the system is designed to be accessed only by those on the same network. Hosting the system publicly raises concerns of data abuse. However, creating secure access controls could solve this.
2. **Local Usage:** While it's a local system, future versions can include broader connectivity options (like cloud storage) for remote access.

Gains:

1. **Reliability:** Real-time, location-based data means less room for error.
2. **Accuracy:** Readings come directly from the environment, providing more accurate information than traditional weather apps.
3. **Sustainability:** The system uses readily available and cost-effective components, making it an economical and eco-friendly option.
4. **Innovative Potential:** The system can be customized and integrated into larger systems (e.g., automatic cooling) for enhanced functionality.

Why Not Public Hosting?

The system is designed for local, real-time use. Public hosting could introduce risks of data abuse or unwanted usage, whereas local hosting ensures the data is relevant to the users nearby and maintains security.

Future Potential:

1. Adding IoT capabilities for remote monitoring.
2. Incorporating AI for predictive weather analytics.
3. Customizations like alert systems or integration with smart home systems.

This project addresses the gaps in traditional weather forecasting by delivering a low-cost, high-accuracy, and scalable solution for personal or community use!