**Weather and Pollen data for IP Address**

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**Abstract**

Everyone has days when fresh air would be enjoyable, but many, are unable to enjoy the fresh air due to weather conditions and or allergies. Although many applications exist that provide weather and pollen data, they do not provide much detailed data. In this work, we design and develop an API that will provide more detailed pollen and weather data using the location from an IP address. OpenWeatherMap, ip-api, and BreezoMeter Pollen APIs are used in the creation of this API called WPI.

1. **Introduction**

There are days when fresh air would be enjoyable for everyone. Although, for many individuals, there are days they are unable to enjoy fresh air due to weather conditions and or allergies. Of course, some applications can be used to check weather and pollen to determine if they can enjoy some fresh air. For instance, individuals can use the Meteomatics API to fetch historical, current, and forecast data for any location (n.d.). The Meteomatics API provides weather data from temperature to precipitation and pollen concentration data for types such as birch. However, many of these applications, such as Meteomatics API, that provide weather and pollen data do not provide much detailed data.

In this paper, WPI, a Weather and Pollen data for IP addresses API is designed and developed. While there are existing APIs that provide weather and pollen data for different locations, WPI will provide more detailed data. For example, when requesting pollen data users will receive all the available pollen types including their color, category, seasonality, index, index description, health recommendations, and plant description for the requested location. In creating WPI the APIs OpenWeatherMap, ip-api, and BreezoMeter Pollen are APIs used. OpenWeatherMap was used for weather data, ip-api for location data, and BreezoMeter Pollen for pollen data.

1. **Motivations and Background**

In this section, there will be a description of the terminology used in this paper and a motivating example for IPW.

*II.I Terminology*

* **Internet Protocol address (IP address)** is a numerical identifier assigned to a device connected to the internet. It allows a device to send and receive data, communicate with other devices, identify the host or network being used, and identify the device's location.
* **Latitude (Lat)** is a coordinate that identifies the distance north or south of the earth’s equator. It ranges from -90 degrees at the south pole to 90 degrees at the north pole.
* **Longitude (Long)** is a coordinate that identifies the distance east or west of the meridian at Greenwich, England. It ranges from 0 degrees at the meridian to 180 degrees eastward and -180 degrees westward.
* **Temperature** is the degree of heat in an object or substance that can be measured in Fahrenheit or Celsius. In this paper, temperature will be measured in Fahrenheit.
* **BreezoMeter Pollen Index (BPI)** is a global unified index that uses a scale of 0 (None) to 5 (Very High). BPI helps simplify comparing pollen in different locations.
* **Types\_information** lists all the pollen types available at the location requested and includes their BreezoMeter Pollen Index, color, category, and seasonality.
* **Index\_description** is a sentence that describes the index level which helps users understand the index level.
* **Health\_recommendations** are insights, that can be acted upon, provided based on the pollen levels.

*II.II Motivating Example*

Given an IP address, it is processed through the ip-api API returning the latitude and longitude coordinates. The ip-api API allows users to look at other information that is related to IPV4 and IPv6 addresses such as time zone, country, region, etc. The latitude and longitude coordinates are used to make a request to OpenWeatherMap API and fetch the temperature data. OpenWeatherMap API gives users access to the current weather data, such as temperature and rain, for any location on Earth. The coordinates are also used to make a request to BreezoMeter Pollen API and fetch pollen information including types, indexes, and health recommendations. This API allows users to identify and learn more about the plants that affect their allergies.

1. **Proposed Approach**
2. **Discussion**
3. **Related Work**
4. **Conclusion and Future Work**

**References**

[Meteomatics] (n.d.). Particles. Retrieved April 1, 2024, from <https://www.meteomatics.com/en/api/available-parameters/particles/#pollen_concentrations>