

The combination with map and air quality

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If you want to develop map-related applications, you first need to understand the concept of Global Positioning System (GPS).

GPS is a geographic information system (GIS) that uses satellites located above the Earth to provide positioning and navigation services. The development of Google Maps went through several key steps. First, rough maps are generated from satellites. However, to make Google Maps what it is today, a necessary punctuation step was needed. The company sent Google cars to survey all passable streets, counting the locations of traffic lights, highway entrances, shops, and so on, and marking these locations on a map in the form of dots. The positions of these points are actually defined using a spherical three-dimensional coordinate system, known as the geographic coordinate system, which consists of dimension, longitude, and geodesic height. This three-dimensional coordinate system can be projected onto a map to form two-dimensional coordinates[1].

In the initial development stage of map software, you can directly use the map API as a platform to combine spatial data from multiple sources to create new map services. For example, Google offers a wide range of apis for developers who use JavaScript[2].

Today, excessive carbon dioxide emissions have become a serious problem. This paper takes carbon dioxide pollution as an example and discusses it with GPS technology. Emissions from motor vehicles are considered to be the main source of urban air pollution. The contribution of motor vehicles to global CO₂ emissions ranges from 13% to 30%. Therefore, in this paper, we can locate the monitoring point of carbon dioxide on the road[3]. Pollutant emissions can be calculated by the formula $E = L * C$, where E represents the emission of pollutants (in kilograms), L represents the number of kilometers traveled by the vehicle (in kilometers), that is, the product of the traffic volume and the length of the road, C represents the emission coefficient of pollutants (in kilograms/kilometers). Emission factors can be obtained from data such as CTCI Corporation. GPS technology can be used to calculate road lengths, thus combining maps and air pollution[4].

In conclusion , the key to combining maps and air quality lies in pollutant calculation formulas and three-dimensional coordinates. By using GPS technology, we are able to combine mapping applications with environmental pollution monitoring to provide people with more comprehensive and useful information.

[1]Wieczorek, W. F., & Delmerico, A. M. (2009). Geographic information systems. In The Geographic Information Science & Technology Body of Knowledge. Association of American Geographers.

[2]Hu, S., & Dai, T. (2013). Online map application development using Google Maps API, SQL database, and ASP.NET. Journal of Applied Mathematics, 2013, 1-7

[3]Commission of the European Communities, 1990

[4]Lin, M.-D., & Lin, Y.-C. (2001). The application of GIS to air quality analysis in Taichung City, Taiwan, ROC. Environmental Monitoring and Assessment, 75(3), 273-291

