

# Policy Research on Unmanned Intelligent Monitoring and Processing Technology to Improve the Level of Environmental Protection

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**Abstract.** In order to meet the development trend of smart environmental protection platforms and smart environmental monitoring systems, this paper proposes the recommendations of unmanned intelligent detection and processing technologies to improve the level of environmental monitoring. The article discusses its features, highlights and architecture from two perspectives: theory and practice. With a view to providing reference for the application and development of unmanned intelligent detection processing technology in the field of environmental protection.

## Introduction

In recent years, new technologies such as 4G, cloud computing, high-definition, and intelligent analysis have gradually penetrated into all areas of the environmental protection industry. The integration of environmental protection monitoring and business needs has gradually deepened.<sup>[1]</sup> Using technologies such as the Internet of Things, sensors, global positioning systems, video surveillance, and big data can help promote smarter environmental protection and achieve accurate and precise environmental management and decision-making.<sup>[2]</sup> However, the protection of the ecological environment is complex and time-varying. It involves multiple departments, multiple regions, and multiple fields and needs to handle a wide variety of data.<sup>[3]</sup> This requires that environmental protection monitoring systems also develop to high integration, information, intelligence, and strong computing power. Based on this, this paper proposes the concept of unmanned intelligent monitoring and processing technology to improve the level of environmental protection. First of all, from a theoretical point of view, it summarizes the characteristics and highlights of unmanned intelligent monitoring and processing technology to improve the level of environmental protection; secondly, from the perspective of practical application, it elaborates its architecture and overall design. With a view to providing reference for the application and development of unmanned intelligent detection processing technology in the field of environmental protection.

## Features Overview

Unmanned intelligent environment monitoring is based on the Internet of Things technology. It

embeds sensors and equipment into various environmental monitoring objects, integrates the Internet of Things in the environmental protection field through supercomputers and cloud computing, and realizes the integration of human society and environmental systems. A detailed and dynamic approach to environmental management and decision-making. Its main role can be divided into three aspects: First, the use of data management, through the automatic extraction of real-time data of various environmental monitoring objects, timely and accurate reflection of the monitoring of the situation, to achieve precise management; Second, the use of data decision-making, utilization of materials Networking technology integrates environmental monitoring data to form an integrated information processing platform that consists of all elements of the ecological environment. It is presented through intelligent terminals, which facilitates the viewing of monitoring data at any time and anywhere to provide scientific decision-making. The third is the use of data services. To make environmental data open and transparent to the public, so that more people can participate in environmental governance and reflect the convenience of public services.

Its characteristics can be summarized in the following four aspects.

#### **Realize the management of the ecological environment.**

The various components of an ecosystem are interdependent and mutually restrictive and inseparable. Unmanned intelligent monitoring can use the Internet of Things to integrate monitoring data of various elements of the ecosystem to achieve comprehensive monitoring and systematic analysis of water pollution, air pollution, soil pollution, solid waste, and radioactive sources as the figure 1 shows.

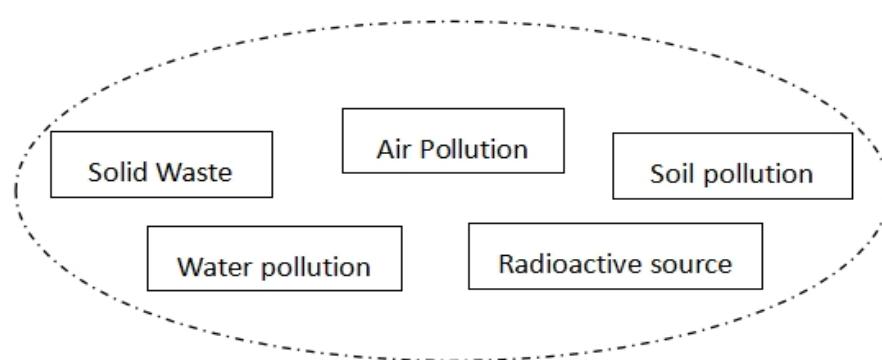


Figure 1 ecological environment factors

#### **Provide accurate decision support.**

In the past, a large part of environmental protection decision-making relied on the management of infrastructure, and the application of data was relatively small. Unmanned intelligent monitoring sets up a system testing platform, based on a resource catalog, to form a clear-cut environmental data mart. Taking the decision-making content as the main line and the ecological indicators as the traction, through a multi-dimensional statistical model of data, review the laws of data changes, so that environmental management planning, emergency decision-making, and pollution management

measures are more reliable, scientific, and smarter.

### **prevention and control more predictable.**

The unmanned intelligent monitoring system platform can realize real-time monitoring, analysis and evaluation and abnormal early warning of regional air quality, water environment and pollution sources. Using platforms for data analysis, on the basis of environmental monitoring, we can provide early warning for changes in the ecological environment, natural disasters, and environmental emergencies.

### **prevention and control more predictable.**

Relying on the integrated information processing platform and mobile office APP, it has built a bridge between the government and the public. Using an integrated information processing platform to form an integrated business collaboration model of online acceptance, handling, and feedback, to improve service levels and improve the performance of administrative approvals. Through the mobile office APP, the public can view environmental quality information in real time, and participate in public surveys, reflecting various environmental demands.

## **Architecture**

### **Overall Design**

The unmanned intelligent monitoring and processing technology utilizes big data collection, storage, analysis, processing, and application to integrate the entire business process of environmental monitoring to improve the management level of environmental big data and enhance the capacity of environmental big data sharing services for environmental management and government. Decision-making and information disclosure provide comprehensive and multi-level environmental big data services. The unmanned intelligent detection processing technology proposed in this paper is realized through the integrated information processing platform + mobile office APP. The overall framework diagram is shown in Figure 2. Each sensor of the monitoring station collects environmental information, and the collected information is transmitted to the data acquisition core module. After the data acquisition core module analyzes and processes the data, it transmits the information to the server or mobile phone APP through GPRS or Bluetooth. The server or mobile phone APP is visualized after the second data analysis and processing<sup>[4]</sup>.

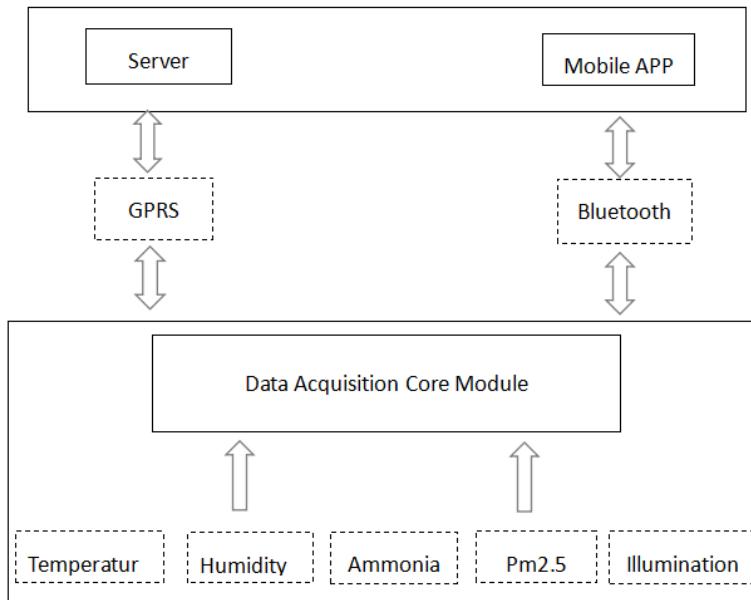


Figure 2 environmental monitoring system overall framework

## Elements

At present, data resources used in the field of ecological environmental protection mainly include three types: ground monitoring data, remote sensing monitoring data, and geographic information data. The unmanned intelligent

monitoring platform is based on the above three types of data to achieve unified storage and coordination. Its platform subsystems mainly include environmental data centers, office OA systems, mobile office systems, distribution and assessment of environmental protection task assignments, petition system upgrades, environmental information inquiry systems, environmental solid waste management systems, environmental solid waste management systems, and environmental protection violations. Management system, environmental risk source sensitive source management system, environmental emergency command system, geographic information system upgrade, urban dust monitoring system upgrade, radiation source monitoring system, hazardous waste monitoring system, and motor vehicle exhaust monitoring system.

## System Evaluation

Unmanned intelligent monitoring relies on an integrated information platform and mobile phone APP to establish a dual-terminal mode, using computer desktop terminals and wireless network mobile terminal modes to implement mobile office and mobile law enforcement, and strengthen environmental management and assessment methods. It is guided by the construction of data standards and combines the centralized storage of the subject database with distributed cloud storage to construct an environmental data center, so that information can be unified and interoperable, and problems caused by fragmented information and mismatched formats can be eliminated<sup>[5]</sup>. In order to achieve a comprehensive and intelligent "environmental big data" convergence and effective information tracking management.

## Conclusion

Using big data to effectively improve the actual management level and use big data to effectively drive environmental technology innovation, such an environmental protection concept will inevitably become a new development goal and direction for the environmental protection field, and drive environmental protection work to a higher level<sup>[6]</sup>. In this paper, the unmanned intelligent detection processing technology is introduced into the ecological environment protection work, and all the elements of the ecological environment monitoring data are collected, so that the related business applications have a unified underlying data support. In addition, the use of environmental big data analysis can assist government decision-making and risk prevention and control, promote information disclosure, and facilitate public participation in supervision. In the future, more timely and effective environmental supervision can be achieved through the integrated information platform and mobile office APP.

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