Paper 101

Research on AI-Based Pollution Source Tracking and Precision Remediation Technology

Environmental pollution remains a significant global challenge, requiring advanced technologies for effective monitoring, source identification, and remediation. Traditional pollution source tracking methods rely on manual sampling, chemical analysis, and mathematical modeling, which are often time-consuming, labor-intensive, and limited in accuracy. With the rapid development of artificial intelligence (AI), machine learning (ML), and big data analytics, new opportunities have emerged for improving pollution source tracking and precision remediation.

AI-powered models can process vast amounts of environmental data, including satellite imagery, sensor networks, and historical pollution records, to identify potential pollution sources with high accuracy. By utilizing deep learning algorithms, AI can detect pollution patterns, predict dispersion pathways, and optimize remediation strategies in real-time. Additionally, AI-driven Internet of Things (IoT) systems enable continuous monitoring and automated response mechanisms, reducing human intervention and improving efficiency.

This study explores the integration of AI with pollution source tracking and precision remediation. Key aspects include data-driven modeling, real-time pollution detection, and adaptive remediation techniques. The research aims to enhance environmental protection efforts by developing intelligent frameworks that facilitate efficient and cost-effective pollution control.