Chapter 7
The Role of IoT in Shaping the Future of Geospatial AI

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ABSTRACT

This chapter shows about the new expertise for instance AI, ML, and IoTs which has altered the geospatial sector, which involves the collecting, analysis, and display of geographical data. These technologies drive industrial innovation and growth by allowing for more precise and efficient data collecting, analysis, and decision-making. AI & ML are especially significant in the geospatial business because they enable the analysis of enormous quantity of facts that would be too time-consuming for people to handle manually. AI and ML methods can examine and understand geographical data such as satellite imaging, aerial photography, and LiDAR scans, revealing patterns and trends that humans may miss. The IoTs is also propelling the geospatial sector forward by allowing for the capture of real-time data from sensors implanted in actual things. Weather sensors, traffic sensors, and GPS trackers are examples of IoTs devices that may provide useful geographical data for decision-making in a kind of business, including farming, transportation, and town development.

DOI: 10.4018/979-8-3693-8054-3.ch007

1.1 INTRODUCTION

The convergence of the IoTs and Geospatial Artificial Intelligence (AI) is changing the way geographical data is gathered, processed, and utilized across sectors. The Internet of Things (IoT) is a network of linked devices and sensors that create real-time data, whereas geospatial AI analyzes and interprets geographic information using Machine Learning (ML) and AI techniques. When coupled, IoTs and Geospatial AI have the potential to transform industries such as town development, ecological scrutinizing, transportation, and farming by providing actual-time insights and predictive analytics depended on location-specific data (Ahmad & Nabi, 2021).

IoT devices, such as GPS-enabled sensors, drones, and smart infrastructure, are constantly collecting massive volumes of geographical data. This data is sent into AI systems, which use it to spot trends, optimize processes, and even forecast future results. The confluence of these technologies improves decision-making processes, allowing companies and governments to better manage resources, adapt to environmental changes, and create smarter cities.

As the number of IoT devices deployed grows and AI models get more complex, the future of geospatial AI will see tremendous expansion, delivering a better knowledge of our physical environment and the forces that drive it. This chapter investigates the crucial role of IoT in enhancing geospatial AI, focusing on its applications, advantages, and future prospects (Anand et al., 2021).

The fast advancement of technology has enabled the convergence of two significant innovations: the IoTs and Geospatial AI. This combination has the potential to transform how we see and interact with our environments. The IoT is a linked set-up of sensors, devices, and structures that interact and exchange data in real time, whereas geospatial AI uses machine learning and AI techniques to analyze and understand geographical or location-based data.

When IoT and Geospatial AI are joint, tremendous synergies emerge that propel progress in a variety of domains, consisting of elegant cities, ecological monitoring, transportation, farming, and disaster management (Bhambri & Bajdor, 2024a). Satellites, drones, GPS systems, smart infrastructure, and other linked technologies create massive amounts of location-specific data on a continual basis. Geospatial AI processes and analyzes data to identify trends, optimize operations, and create more precise forecasts (Bernini et al., 2023).

The Internet of Things plays a significant job in defining the future of geospatial artificial intelligence. IoT improves geospatial models' capabilities by supplying real-time, high-resolution data from a variety of sources, allowing for faster, more informed decisions. For example, IoT-powered Geospatial AI can monitor environmental conditions in real time, enabling for faster responses to natural catastrophes or ecosystem changes. As these technologies grow, the future offers even deeper