

Chapter 4

AI-Based Data Modeling for Smart City Development

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ABSTRACT

The development of many aspects of a smart city heavily relies on artificial intelligence (AI) technology. The most recent AI technologies for building smart cities are examined in detail in this article. According to the analysis, artificial intelligence (AI) is crucial for smart cities both now and in the future. Numerous issues have arisen as a result of the fast population growth, particularly in urban areas. These include garbage accumulation, water scarcity, pollution, transportation congestion, and health issues. The smart city plan is one of the initiatives that governments have launched to address these problems. This plan aims to use contemporary technology to deliver dependable, environmentally friendly services while also enhancing quality of life. In pursuit of this objective, scholars and professionals have developed numerous frameworks for the establishment of smart cities. One of the most important technologies for creating the components of a smart city is AI. Environmental considerations are crucial while creating solutions.

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INTRODUCTION

The development of many aspects of a smart city heavily relies on artificial intelligence AI technology. The most recent AI technologies for building smart cities are examined in detail in this article. According to the analysis, artificial intelligence AI is crucial for smart cities both now and in the future.

Numerous issues have arisen as a result of the fast population growth, particularly in urban areas. These include garbage accumulation, water scarcity, pollution, transportation congestion, and health issues. The smart city plan is one of the initiatives that governments have launched to address these problems. This plan aims to use contemporary technology to deliver dependable, environmentally friendly services while also enhancing quality of life.

In pursuit of this objective, scholars and professionals have developed numerous frameworks for the establishment of smart cities. One of the most important technologies for creating the components of a smart city is AI. Environmental considerations are crucial while creating solutions.

According to this study, artificial intelligence AI can be used to track environmental health variables like emissions, radiation, water contamination, and air quality. Data, which may be obtained from many sensors, is essential for AI solutions. The purpose of this study is to investigate how AI can help with the planning and construction of smart city elements. The concept of smart cities has evolved significantly over time and currently encompasses a wide range of concepts.

Early debates aided in defining what constitutes a “smart” city. Harrison et al. (2010) provided a comprehensive summary, emphasizing the ways in which different technologies and data enhance city operations. Caragliu and Del Bo (2019) emphasized the value of information and communication technology ICT in enhancing the competitiveness and efficiency of cities. As the concept evolved, sustainability became increasingly important. These days, smart city initiatives use data and new technologies to address economic, social, and environmental issues. To identify smart cities, professionals and researchers employ a variety of techniques and metrics. A crucial component is sustainability, which emphasizes lowering resource consumption, supporting renewable energy sources, and enhancing the environment.

The ability of a city to adopt cutting-edge technologies is frequently referred to as its “smartness.” Performance metrics are employed to assess the effectiveness of smart city initiatives and determine whether their objectives are met. Conventional techniques for defining smart cities frequently depend on subjective assessments and manual data collection. These methods may have limitations in terms of accuracy, impartiality, and scalability. By offering fresh approaches to the analysis of urban data, machine learning provides an answer. Machine learning has gained popularity in numerous fields due to its capacity to forecast.

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