Chapter 10
Smart Solutions for Climate Resilience Harnessing Machine Learning and Sustainable WSNs

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ABSTRACT

Smart Solutions for Climate Resilience: Harnessing Machine Learning and Sustainable WSNs presents a comprehensive examination of how cutting-edge technologies can fortify communities against the escalating impacts of climate

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change. The chapter explores the integration of machine learning techniques and energy-efficient Wireless Sensor Networks (WSNs) in environmental monitoring and climate prediction. It outlines strategies to optimize energy consumption within WSNs, emphasizing the utilization of sustainable power sources to support remote monitoring initiatives. Through real-world case studies, this chapter showcases the transformative potential of these technologies in fostering climate resilience and sustainable development, offering insights for researchers and practitioners alike.By elucidating the foundational principles of machine learning and WSNs, this chapter provides a roadmap for leveraging these technologies to confront the complex challenges posed by climate change.

INTRODUCTION

As the impacts of climate change intensify, the imperative for cities to become resilient to its effects has become increasingly urgent. In this context, the integration of cutting-edge technologies presents a promising avenue for enhancing climate resilience. Among these technologies, machine learning (ML) techniques and sustainable wireless sensor networks (WSNs) stand out for their potential to revolutionize how cities monitor and respond to environmental risks. The introduction emphasizes the crucial role of smart solutions in building climate resilience. With cities facing a multitude of climate-related challenges, from extreme weather events to rising sea levels, the need for innovative approaches to adaptation and mitigation has never been greater. By harnessing the power of ML and sustainable WSNs, cities can develop proactive strategies to address these challenges and build more resilient communities.

This introduction sets the stage for exploring the transformative potential of ML and sustainable WSNs in enhancing climate resilience. It highlights the importance of leveraging these technologies to develop smart solutions that can adapt to changing environmental conditions and mitigate the impacts of climate change. Throughout the subsequent discussion, we will delve into practical applications, methodological approaches, and emerging trends in the integration of ML and sustainable WSNs for climate resilience. Ultimately, the goal is to pave the way for the development of more sustainable and resilient urban environments in the face of ongoing climate change challenges.

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