

Chapter 5

AI and Machine Learning in Carbon Sequestration

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ABSTRACT

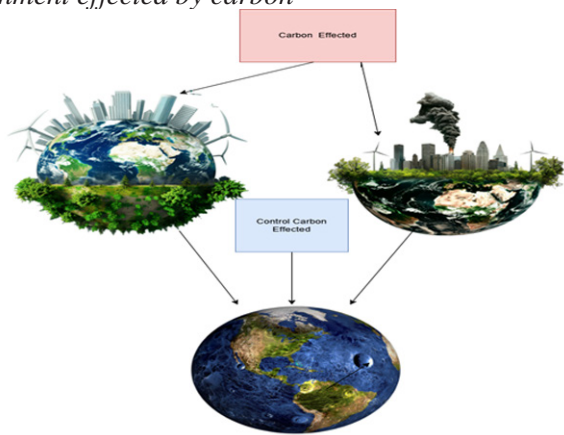
Carbon sequestration, which collects and stores carbon dioxide from the atmosphere, is a crucial tactic in the fight against climate change. The precision, scalability, and efficiency of carbon sequestration techniques could be revolutionized by advanced computing techniques like artificial intelligence (AI) and machine learning (ML). We examine how machine learning and artificial intelligence can transform carbon sequestration, with a particular emphasis on how they can be applied to enhance carbon restriction methods, maximize land use plans, and track carbon flow rates.

DOI: 10.4018/979-8-3373-2091-5.ch005

1. INTRODUCTION

The global climate disaster necessitates quick action to increase carbon sequestration and cut greenhouse gas emissions. As one of the biggest global carbon sinks, soils play a critical role in the global carbon cycle because soil types, meteorological situation, and land use patterns vary greatly, it might be difficult to optimize storage space and modify soil carbon dynamics. It's possible that conventional methods of managing soil carbon be short of the accuracy and scalability needed to grip these intricate circumstances. Intelligent Carbon Management Systems (ICMS) combine machine learning (ML) and artificial intelligence (AI) to maximize storage and change soil carbon dynamics. This chapter examine the integration of AI and ML into carbon management systems to improve comprehension of the soil carbon cycle, forecast carbon appropriation capacity, and maximize storage alternatives. ICMS provides an original approach to climate resilience and sustainable land management by fuse soil science with state-of-the-art computer techniques (Bello, O. A., & Olufemi, K. 2024).

Figure 1. Environment effected by carbon



2. SOIL CARBON DYNAMICS: CHALLENGES AND OPPORTUNITIES

Soil input, poverty, stabilization, and loss are the four phases that make up the carbon cycle (Devi, T. A., & Jain, A., 2024). Climate, vegetation, microbial activity, soil type, and land management methods are in the middle of the many elements

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