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Machine Learning Applications for CO_2 Emission Reduction in Smart Agriculture and Cities Optimization

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Abstract:

The optimization of CO_2 emission reduction strategies is a critical challenge in both agriculture and urban environments. This study explores the application of machine learning algorithms to reduce CO_2 emissions by optimizing agricultural practices and urban infrastructure management. In smart agriculture, machine learning models analyze data from IoT sensors to optimize irrigation, fertilization, and crop management, reducing energy consumption and greenhouse gas emissions. In smart cities, machine learning techniques are employed to improve traffic flow, energy usage in buildings, and waste management, all contributing to lowering CO_2 emissions. Algorithms such as Random Forests, Support Vector Machines (SVM), and Neural Networks are applied to real-time datasets to predict and optimize emissions in both sectors. Experimental results show that integrating machine learning with smart systems leads to more efficient energy use and resource management, resulting in significant reductions in CO_2 emissions and fostering sustainable development.

Keywords:

CO_2 reduction, machine learning, smart agriculture, smart cities, emission optimization, sustainability.

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