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AI and Big Data Technologies For Renewable Energy Management

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Energy is an essential element, but its negative consequences such as environmental deterioration, resource depletion and energy dependencies puts energy efficiency alternatives/or solutions in the spotlight. Therefore there is need for the fusion of AI and Big data in promoting sustainable growth in the renewable energy sector, AI and Big Data focuses on optimizing algorithms, reducing computational needs, and using renewable energy. These technologies are main drivers for transformative approach towards achieving Sustainable Development Goals (SDG), Mainly SDG 7(Affordable and clean energy),SDG 9(Industry, Innovation and Infrastructure) and SDG 13 (Climate Action).This study will explore the role of AI and Big Data in renewable energy and sustainable development. The methodology will employ text mining techniques to refine AI and Big Data concepts into targeted keywords, with further filtering via the All Science Journals Classification system and SDG-mapping tools to identify publications most relevant to renewable energy applications. The research specifically investigates how predictive analytics can forecast future energy demands, assess climate risks, and identify renewable energy potential across different regions. By identifying best practices and innovation opportunities at this intersection, this study aims to provide a framework that can accelerate progress toward energy sustainability and support global efforts to achieve a net-zero future.

Keywords (Artificial Intelligence, Big Data, Sustainable Development Goals, Renewable Energy, Net Zero)

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