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Author: Mrs. Maike Söderholm
University of Vaasa, Finland

Dr. Mikko Ranta
University of Vaasa, Finland
Mr. Cem Özcan
University of Vaasa, Finland

UNVEILING HIDDEN INSIGHTS: AI-DRIVEN SATELLITE DATA ANALYSIS FOR CORPORATE ESG ASSESSMENT

Abstract

As sustainability emerges as a global priority, companies are increasingly expected to prioritize Environmental, Social, and Governance (ESG) aspects in their operations. This demand has been underscored by new regulations such as the European Union's Corporate Sustainability Reporting Directive (CSRD), which mandates detailed sustainability reports from companies. However, despite these regulatory efforts, disagreements in ESG ratings persist. These discrepancies often arise from variations in methodologies or data sources used by different rating agencies, resulting in inconsistent sustainability assessments for corporations.

Satellite technology offers innovative ways to monitor the environmental impacts of corporate activities, providing evidence of compliance with environmental regulations and contributing to more transparent sustainability reports. Satellite data enables the analysis of current performance and facilitates the examination of a company's performance over time, thereby enhancing the depth and accuracy of environmental assessments.

The primary aim of this research is to develop an AI-driven analysis solution utilizing satellite data and other relevant datasets, to create a comprehensive tool for the environmental assessment of companies. The suggested solution utilizes deep learning and data fusion of different satellite data types for enhanced spatial and temporal resolution needed for company-level monitoring. This tool provides businesses, policymakers, and investors with standardized means for evaluating a company's environmental impact and sustainability efforts. The approach promotes transparency and comparability, aids informed decision-making, and fosters a widespread culture of sustainability in various industries, ensuring compliance with EU sustainability directives.

In conclusion, this research showcases the potential of satellite data and deep learning in enhancing the reliability, accuracy, and objectivity of corporate ESG assessments. With an empirically based method that aligns with the European Sustainability Reporting Standards (ESRS) and EU taxonomy, this strategy introduces a more standardized framework for environmental evaluation and greatly impacts decision making across various industries. Furthermore, this research promotes innovation in satellite data utilization by introducing a novel AI-driven solution for satellite data analysis.