27 Impact of Technology on Environment

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The rapid development and efficiency of Artificial Intelligence (AI) tools have made them increasingly popular in various fields and research domains.

AI tools can also assess even more complex environmental data, such as predicting spatiotemporal environmental data, evaluating, forecasting, water quality. A sub-field of machine learning (ML), is an effective technique for processing and analysing intricate data. It uses neural networks with specialized layers to extract deeper levels of information at each layer. To understand and interpret environmental data, various geophysical parameters need to be processed, like physical, chemical, and biological properties of surface waters, atmosphere, and land surface. These parameters can be measured in several ways, such as vegetation coverage, moisture content, species concentration, aerosol concentration, and more. AI can also expedite technological advances, speed the development of new and more sustainable materials, improve energy efficiency, inform disaster response, and forecast environmental processes like erosion, landslides, and weather patterns. AI techniques possess the ability to reason, make decisions, and learn from data. They can transform real-world information into machine-understandable and usable knowledge and make decisions through planned pathways of optimization and solution searching

AI applications in the environmental disciplines

Environmental science and engineering tackle complex issues that arise from different natural environments, including soil, water, air, organisms, and biological data. Thanks to current AI technologies, such a large amount of data can be efficiently managed and assessed. Gathering data from various sources, including demographic information, traffic trends, energy usage, and socioeconomic factors, can provide valuable insights and help predict environmental conditions. Integrating big data.

Ai Appication in Fuel industry

Analyzing historical data, seasonal patterns, weather conditions, and other variables, AI systems can generate precise predictions. Real-time fuel quality data analysis, identifying potential issues such as contamination or low-quality fuel,

AI in Paper industry

The papermaking has two main stages, pulping and papermaking. The agitator and the deflaker are used in the pulping process, and the dryer is used in the papermaking process respectively. In the pulping process, the stirring speed needs to be predicted to prevent slurry concentration quality problems. In addition, it is necessary to continuously monitor the current water consumption of the deflaker to achieve abnormal early warning during the dredging process and reduce equipment failure losses. In the papermaking process, some sensors of the dryer are exposed to the humid environment for a long time, which leads to a high damage rate and the difficult monitoring, especially the supply air pressure of the dryer. The paper web should be dried as evenly as possible (vertically and horizontally) in the drying part to avoid wrinkles, edge warping, and other problems, and therefore a good ventilation system is needed. Towards these goals, we infuse digital twins related technologies into the papermaking process to help address those problems.

In this work, we propose an intelligent digital twin system (IDTS) framework to improve the production efficiency in the paper industry. Coupling with different stages in the papermaking procedure, we develop the corresponding prediction models, including the prediction models for the stirring speed of the dump chest, the water consumption of the deflaker, the supply air pressure of

the dryer, and the exhaust air temperature of the dryer. The stirring speed model of the dump chest screens out a section of eligible data and obtains the liquid level to analyze the stirring speed. The water consumption model predicts the outlet flow of the deflaker based on extreme random forests. The prediction model for the supply air pressure of the dryer predicts the indicator of the pressure to reduce the maintenance and production costs using the regression model. The prediction model for the exhaust air temperature of the dryer selects the most effective features to model the temperature data using Light Gradient Boosting Machine (LightGBM) and takes the exhaust air temperature of the dryer as the result for the regression model training.

AI reduces emissions of buildings

We believe that AI can improve energy efficiency and reduce carbon emissions through two main approaches.AI helps scale up the best available technologies and practices. Because it can significantly help to scale up the technologies and speed adoption by reducing the construction and labor costs. Thus, it can lead to larger scale penetration of efficient technologies;,AI can further improve and optimize design, construction, and operation over the entire buildings' lifecycle, which brings in additional saving.We believe that AI can improve energy efficiency and reduce carbon emissions through two main approaches: (1) AI helps scale up the best available technologies and practices. Because it can significantly help to scale up the technologies and speed adoption by reducing the construction and labor costs. Thus, it can lead to larger scale penetration of efficient technologies; (2) AI can further improve and optimize design, construction, and operation over the entire buildings' lifecycle, which brings in additional saving

Artificial intelligence (AI) technology promotes low-carbon energy transformation:
The effect varies significantly across different periods and regions. The application of AI triggers the industrial upgrading and energy rebound effects. The effect of AI is heightened when innovation factor flows surpass the threshold.

Conclusion

The latest applications of Artificial Intelligence (AI) tools in the environmental discipline. We explored the opportunities that AI offers and discussed the advantages and disadvantages of implementing these tools in the environmental fields. AI technologies are helping to manage and assess large amounts of environmental data from sources such as demographics, traffic trends, and energy usage. Integrating big data and AI offers new possibilities for environmental tasks such as.

Works Cited

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