



CarbonWise AI: Skills for a Low-Impact Lifestyle

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Abstract

- CarbonWise AI: Skills for a Low-Impact Lifestyle is an AI-driven platform designed to promote sustainable living by equipping individuals with the knowledge and skills needed to reduce their carbon footprint.
- The system utilizes machine learning and data analytics to provide personalized recommendations on energy efficiency, sustainable consumption, waste reduction, and eco-friendly transportation.

Introduction

Background

- Rising carbon emissions and environmental degradation threaten global sustainability.
- Many individuals lack awareness and practical guidance to adopt eco-friendly habits.
- Traditional sustainability programs often fail to engage users or provide personalized solutions

Problem Statement

- individuals lack awareness and practical guidance to reduce their carbon footprint.
- Traditional sustainability programs are often ineffective due to low engagement and a lack of personalization.

Methodology

Model Selection and Development

- To provide accurate and personalized sustainability insights, CarbonWise AI utilizes a combination of machine learning (ML) and deep learning (DL) models for behavior analysis and carbon footprint estimation.

Evaluation Metrics

To assess the effectiveness of CarbonWise AI, various evaluation metrics are used to measure accuracy, user engagement, and sustainability impact.

Model Performance Metrics:

- Accuracy & Precision:** Measures how accurately the AI predicts a user's carbon footprint and recommends sustainable actions.

Implementation and Results

Implementation Details

Implementation Details The implementation of CarbonWise AI: Skills for a Low-Impact Lifestyle involves the integration of AI-driven analytics, data processing, and real-time sustainability tracking. Below are the key components of the implementation.

Backend Development: Developed using Python (Flask/Django) for API management and AI

Results and Analysis

CarbonWise AI successfully helped users adopt sustainable habits by providing AI-driven insights and real-time carbon footprint tracking.

Analysis:

- The AI-driven approach proved effective in influencing behavior, with personalized insights and gamification significantly improving user participation.
- Future enhancements, such as deeper AI learning and wider IoT integration, can further increase impact and scalability.

Discussion

Limitations

- Despite its effectiveness, CarbonWise AI has some limitations
- Data Accuracy: The system relies on user inputs and external data sources, which may contain inconsistencies or errors.
- Limited IoT Integration: Not all users have access to smart home devices or wearable tech, reducing the precision of automated tracking.
- Internet

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Solution Impact

- 1 Carbon Footprint Reduction: Helps users cut emissions by promoting energy efficiency, sustainable transport, and waste reduction.
2. Behavioral Change: Encourages eco-friendly habits through AI-driven insights, making sustainability a part of daily life.
3. Resource Conservation: Optimizes energy and water use, reducing unnecessary consumption.
4. Community Engagement: Encourages collective action through gamification, challenges, and social sharing.

Conclusion

- CarbonWise AI: Skills for a Low-Impact Lifestyle is an AI-driven solution designed to empower individuals to adopt sustainable habits and reduce their carbon footprint.
- By leveraging machine learning, IoT integration, and real-time analytics, the platform provides personalized recommendations, gamification, and impact tracking to encourage eco-friendly behaviors.

References

1. United Nations (UN) Sustainable Development Goals (SDGs)
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<https://sdgs.un.org/goals>
2. Intergovernmental Panel on Climate Change (IPCC) –
Reports on reducing carbon emissions and sustainability.
Available at: <https://www.ipcc.ch/reports/>
3. International Energy Agency (IEA) – Research on energy
efficiency, carbon reduction, and climate change. Available
at: <https://www.iea.org/topics/transport>

Appendices

- Appendix A: Technical ArchitectureAI
- Model Framework: Machine Learning (ML) and Deep Learning (DL) models for sustainability predictions.
- Appendix B: User Interface Design
 - Dashboard Features: Real-time carbon footprint tracking, progress reports, and sustainability tips.
 - Gamification Elements: Challenges, rewards, leaderboards, and interactive learning modules.
- Appendix C: Test Cases & Performance