PROJECT REPORT

AI-ML Internship IBM SkillsBuild

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Title:

Climate Health AI: An AI-Driven Approach to Address Climate-Related Health Risks

Introduction:

Climate change is one of the greatest challenges of our time, significantly impacting public health by increasing the prevalence of heat-related illnesses, vector-borne diseases, and respiratory problems. These impacts are often exacerbated by inadequate health infrastructure, lack of awareness, and delayed interventions.

Artificial Intelligence (AI) offers an opportunity to build resilience by providing early warnings, personalized risk insights, and data-driven support for decision-making in healthcare. This report outlines the development of an AI-powered platform aimed at improving health outcomes by addressing climate-induced health risks.

Problem Statement:

The project addresses the growing need for proactive, scalable, and efficient methods to manage health risks aggravated by climate change. Traditional healthcare systems are reactive, not designed to handle the increasing burden of climate-related diseases effectively. Moreover, gaps in monitoring and awareness leave vulnerable populations at higher risk.

This challenge aligns with UN Sustainable Development Goal 13: Climate Action, which emphasizes the need for urgent and effective responses to climate change and its impacts.

Objective:

The primary objective of this project is to develop and demonstrate an AI-based system capable of predicting and mitigating health risks linked to climate change. The system aims to:

- Provide timely and localized health risk alerts.
- Assist healthcare providers with diagnostic and decision-making support.
- Empower individuals and policymakers with actionable insights.

Why This Problem?

Climate change poses a serious threat to human health globally, with rising temperatures, changing rainfall patterns, and extreme weather events increasing the risk of diseases and mortality. Early detection and prevention are critical to reducing these risks and improving population health, but current systems are inadequate.

An AI-powered approach enables proactive, scalable, and affordable solutions tailored to specific communities and their unique climate-health dynamics.

Solution:

Overview:

Our solution is an AI-driven platform that integrates climate, environmental, and health data to predict health risks, deliver timely alerts, and support healthcare decision-making.

Features:

- Early Detection: Identifies potential health risks before they escalate.
- Personalized Alerts: Sends tailored health guidance via SMS, apps, or kiosks.
- Decision Support: Assists healthcare workers with AI-driven recommendations.
- Data-Driven Insights: Aggregates and analyzes large datasets to reveal trends and inform policies.
- Scalability: Can be deployed widely using cloud-based infrastructure.

Technical Implementation:

- Data Collection & Preprocessing: Gather climate, environmental, and health datasets; clean and prepare them for analysis.
- Model Development: Train AI models (e.g., ensemble or deep learning approaches) to predict risks based on localized data.
- Deployment: Integrate into a user-friendly application for public and health worker use.
- Evaluation: Continuously monitor performance and update models based on feedback and new data.

Why These Resources and Tools?

- TensorFlow: An open-source platform for building and deploying scalable deep learning models, ideal for handling large and complex datasets.

- Scikit-learn: A robust library for classical machine learning algorithms, providing flexibility and efficiency for model experimentation.

- Cloud Infrastructure: For storage, deployment, and real-time processing of high-volume climate and health data.

- Visualization Tools: For creating actionable dashboards and insights for health workers and policymakers.

- Secure Data Practices: Ensure compliance with data privacy and security standards while mitigating bias in predictions.

Conclusion:

This project demonstrates the potential of AI in improving health resilience against climate change impacts. By offering an efficient, proactive, and scalable solution, the platform can enhance preparedness, reduce health burdens, and contribute to global climate action goals (SDG-13).

Continual improvements and collaborations will help expand its reach and effectiveness, creating healthier and more climate-resilient communities.