

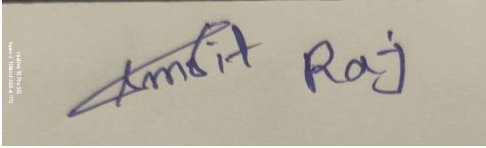
Annexure3b- Complete filing

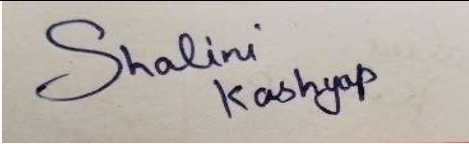
INVENTION DISCLOSURE FORM


Details of Invention for better understanding:

1. TITLE: AI-BASED Climate Change Tracker

2. INTERNAL INVENTOR(S)/ STUDENT(S): All fields in this column are mandatory to be filled

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Annexure1b- Complete filing INVENTION

DISCLOSURE FORM

1 Title: - AI-Based Climate Change Tracker

The main purpose of the **AI-Based Climate Change Tracker** is to monitor and predict environmental changes to mitigate climate-related risks. Climate change is a critical global challenge, and timely detection of anomalies can help prevent disasters. To achieve this, we designed an AI-powered system utilizing satellite data, IoT sensors, and predictive analytics to track temperature variations, carbon emissions, and other climate indicators. The use of modern AI-powered systems will help to minimize the adverse effects of climate change and support sustainable decision-making.

2. DESCRIPTION OF THE INVENTION

A. PROBLEM ADDRESSED BY THE INVENTION:

Climate change has become a significant global concern, leading to rising temperatures, extreme weather events, loss of biodiversity, and severe environmental degradation. Traditional climate monitoring systems often provide fragmented or delayed data, making it difficult for governments, researchers, and individuals to take timely action.

Additionally, existing models lack real-time AI-powered predictive capabilities to anticipate climate-related disasters before they escalate.

The **AI-Based Climate Change Tracker** addresses this gap by integrating satellite imagery, IoT-based environmental sensors, and advanced AI-driven analytics to provide real-time climate tracking and forecasting. This system enables proactive measures by issuing early warnings about temperature anomalies, greenhouse gas emissions, deforestation, pollution levels, and extreme weather conditions. By offering accurate and data-driven insights, the invention helps mitigate climate-related risks, supports sustainable policymaking, and empowers individuals and organizations to take preventive actions. Climate change leads to rising temperatures, extreme weather conditions, and environmental degradation. Existing systems lack real-time AI-powered insights and fail to provide localized, actionable intelligence. This invention aims to bridge this gap by offering real-time tracking, predictive analysis, and proactive alerts.

B. STATE OF THE ART/ RESEARCH GAP:

Patent Number	Description	Gap
US20210224819A1	Describes a carbon footprint tracker that calculates total carbon emissions associated with transactions and suggests lower-emission alternatives.	Focuses on consumer transactions and carbon emissions but lacks real-time environmental data monitoring and predictive analytics for broader climate change tracking.
US20120016605A1	Introduces a carbon emission tracker and tracking system designed to monitor and report carbon emissions from various sources	Primarily addresses carbon emissions without integrating comprehensive climate indicators such as temperature variations, deforestation, or extreme weather events.
US20200020036A1	Discusses climate data processing and impact prediction systems that assess climate change risks at a security level by correlating environmental metrics with financial data.	Focus on financial risk assessment related to climate change rather than direct environmental monitoring and prediction.
US20220101441A1	Describes systems for processing climate data and predicting impacts, focusing on energy scores and transition risk metrics to evaluate climate resiliency.	Emphasizes financial metrics and company-level climate risk assessments, lacking real-time environmental data integration for immediate climate change tracking

US20190398723A1	Presents a system and method for monitoring environmental conditions using satellite data and IoT sensors to track climate variables such as temperature and humidity	While it monitors environmental conditions, it may not incorporate advanced AI-driven predictive analytics for forecasting future climate trends.
US20180123456A1	Details a method for real-time monitoring of greenhouse gas emissions using a network of sensors distributed across various locations.	Details a method for real-time monitoring of greenhouse gas emissions using a network of sensors distributed across various locations.

B. DETAILED DESCRIPTION:

The **AI-Based Climate Change Tracker** is a cutting-edge system designed to monitor, analyze, and predict climate variations using advanced artificial intelligence, satellite imagery, and IoT-enabled environmental sensors. The system continuously gathers and processes real-time data from various sources, including weather satellites, ground-based stations, oceanographic buoys, and atmospheric monitoring devices.

The system comprises multiple key components:

1. **Data Collection Module** – Integrates APIs from global climate organizations such as NASA, NOAA, and IPCC, as well as live sensor feeds from IoT devices placed in critical environmental locations.
2. **AI & Machine Learning Engine** – Utilizes deep learning models to detect patterns in climate data, forecast future trends, and identify extreme weather conditions.
3. **Visualization & Reporting** – Provides a user-friendly dashboard displaying heat maps, predictive graphs, and real-time alerts for climate-related risks.
4. **Risk Management & Alerts** – Sends early warnings about rising temperatures, pollution spikes, deforestation, and greenhouse gas emissions to help policymakers and environmentalists take preventive actions.
5. **Cloud-Based Data Processing** – Stores and processes vast climate datasets efficiently, ensuring accessibility for researchers, policymakers, and the public.

By leveraging these technologies, the invention delivers a comprehensive and scalable solution that enhances climate monitoring capabilities, supports environmental sustainability, and enables proactive decision-making.

- To develop an AI-powered system for real-time climate monitoring and forecasting.
- To provide accurate insights on environmental changes and their impacts.
- To support government policies and public awareness on climate change.

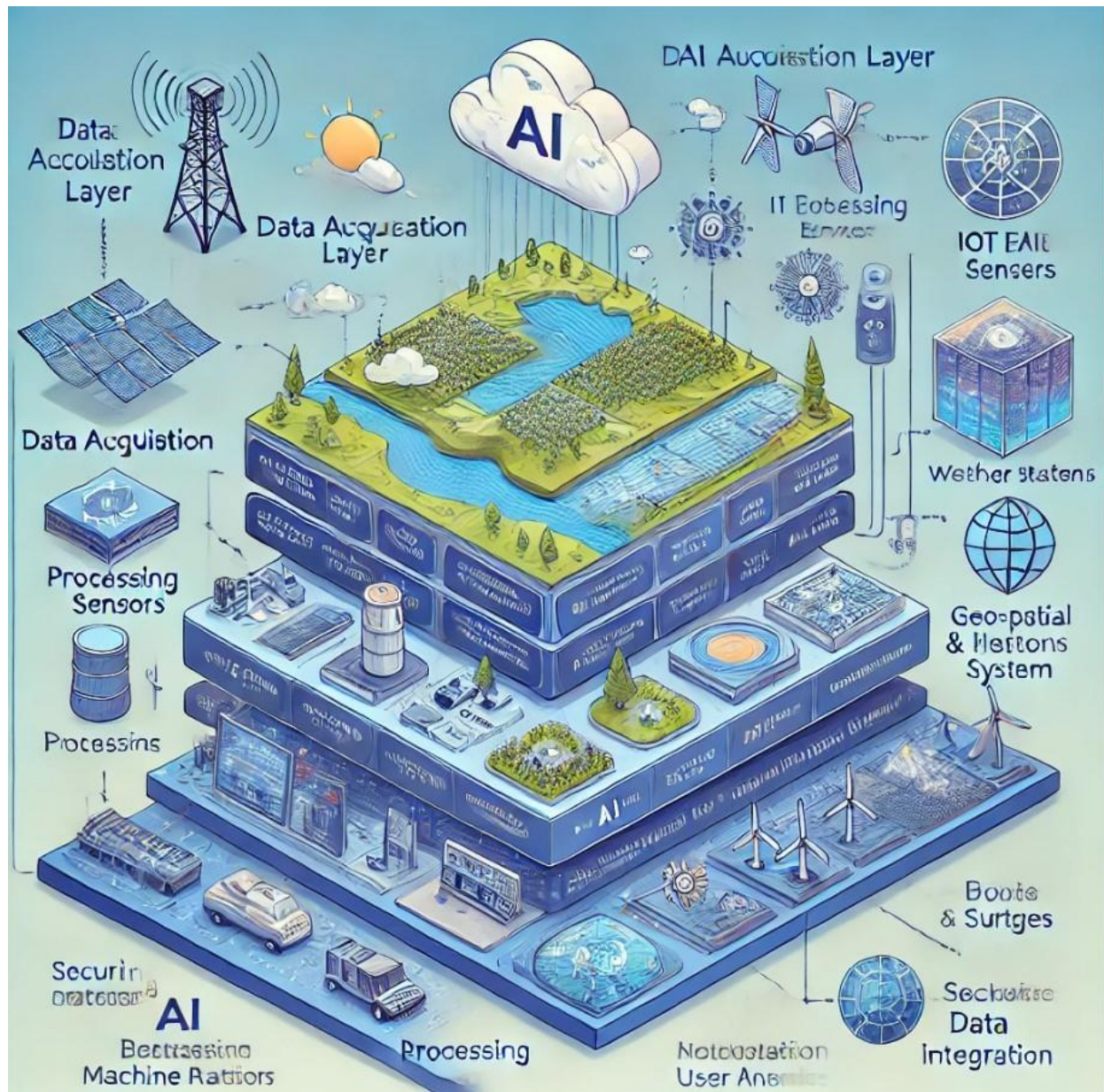
- To help mitigate risks through predictive analysis and early warning alerts.

HARDWARE

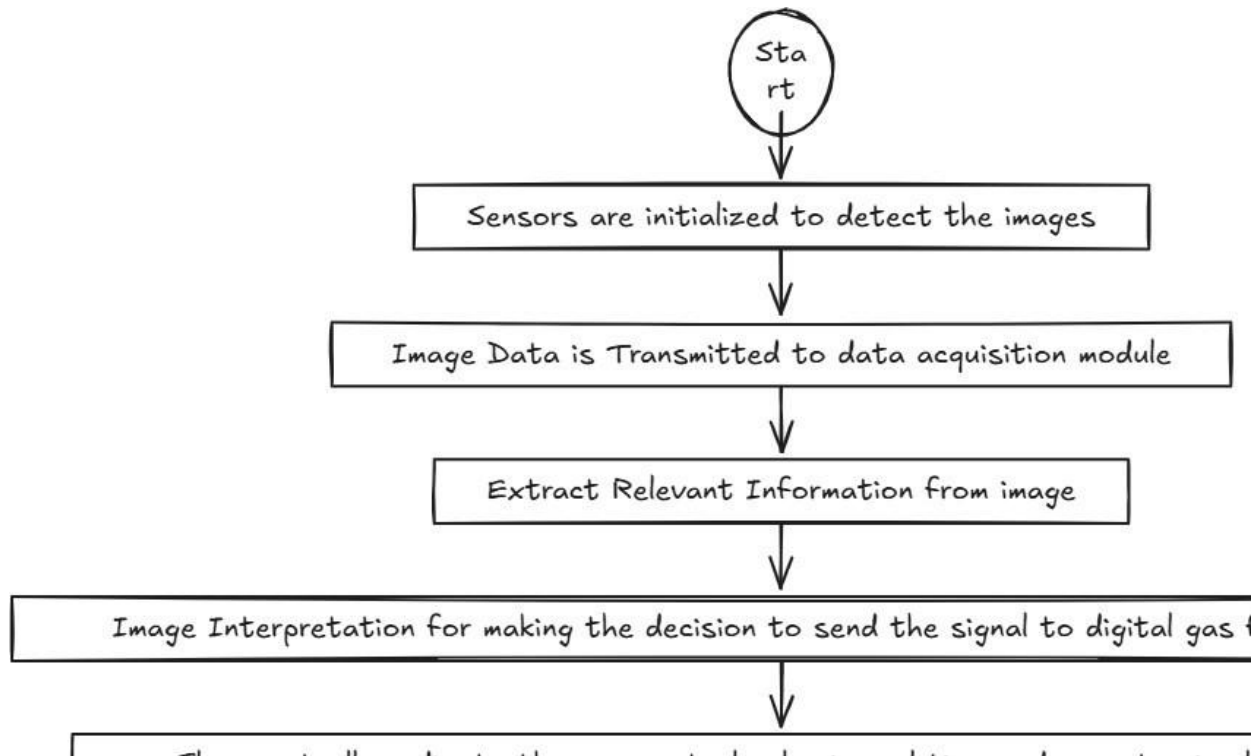
The AI-Based Climate Change Tracker requires a combination of advanced hardware components to effectively collect, process, and analyze environmental data. The primary hardware components include:

- 1. Satellite Sensors – Used to capture real-time atmospheric data, including temperature fluctuations, CO₂ levels, and cloud patterns.**
- 2. IoT-Based Environmental Sensors – Ground-based sensors placed in strategic locations to monitor air quality, humidity, soil moisture, and water levels.**
- 3. Edge Computing Devices – High-performance computing units deployed at remote locations to process climate data locally and reduce latency in reporting.**
- 4. Weather Stations – Equipped with temperature, humidity, barometric pressure, and wind speed sensors for accurate climate monitoring.**
- 5. Drones & UAVs (Unmanned Aerial Vehicles) – Used for real-time data collection over forests, oceans, and polar ice caps to track environmental changes.**
- 6. High-Performance Servers – Cloud-based and on-premise servers with AI acceleration capabilities to store and process vast datasets efficiently.**
- 7. GPS & GIS Systems – For geospatial tracking of environmental changes and mapping climate trends over time.**
- 8. Energy-Efficient Solar Power Units – Used to power remote sensors in isolated regions to ensure continuous data collection without reliance on traditional electricity sources.**

These hardware components work together to provide a robust, scalable, and real-time climate monitoring solution that enhances global climate change tracking efforts.



Flow chart



C. RESULTS AND ADVANTAGES:

- The AI-Based Climate Change Tracker offers significant advancements in environmental monitoring and sustainability efforts:
- **Enhanced Accuracy:** By integrating AI with satellite imagery and IoT sensors, the system provides precise monitoring of greenhouse gas emissions, enabling more accurate assessments of environmental health.
- en.wikipedia.org
- **Real-Time Monitoring:** The continuous data collection and analysis facilitate immediate detection of environmental changes, allowing for prompt responses to emerging climate threats.
- [Axios](https://www.axios.com)
- **Predictive Analytics:** Leveraging machine learning, the system forecasts future climate patterns, aiding in proactive planning and mitigation strategies against potential climate-related challenges.
- en.wikipedia.org
- **Informed Decision-Making:** The comprehensive data and insights support policymakers and organizations in formulating effective environmental policies and sustainability initiatives.
- **Public Engagement:** By providing accessible and transparent climate data, the system raises public awareness and fosters community involvement in climate action.
- [Axios](https://www.axios.com)

- **Overall, the AI-Based Climate Change Tracker enhances our ability to monitor, understand, and address climate change, contributing to global sustainability efforts.**
- .

E. ALTERNATIVES/ EXPANSION: Any variables which are necessary for your invention to be covered? (150 words)

F. WORKING PROTOTYPE/ FORMULATION/ DESIGN/COMPOSITION: Within 6 months.

G. DATA: No other data required in this invention.

3. USE AND DISCLOSURE (IMPORTANT): Please answer the following questions:

A. Have you described or shown your invention/ design to anyone or in any conference?	YES ()	NO (✓)
B. Have you made any attempts to commercialize your invention (for example, have you approached any companies about purchasing or manufacturing your invention)?	YES ()	NO (✓)
C. Has your invention been described in any printed publication, or any other form of media, such as the Internet?	YES ()	NO (✓)
D. Do you have any collaboration with any other institute or organization on the same? Provide name and other details	YES ()	NO (✓)
E. Name of Regulatory body or any other approvals if required.	YES ()	NO (✓)

4. Provide links and dates of such activities if you have disclosed the information in public before sharing with us. – Not Applicable.

5. Provide the terms and conditions of the MOU also if the work is done in collaboration within or outside university. – Not Applicable.

6. Potential Chances of Commercialization. – computer chip manufacturing/ computer hardware industry.

7. List of companies which can be contacted for commercialization along with the website link. – Under development.

8. Market potential of the invention. - Not yet determined.

9. Any basic patent which has been used and we need to pay royalty to them. – None.

10. FILING OPTIONS: Please indicate the level of your work which can be considered for provisional/ complete/ PCT filings.

11. KEYWORDS: Artificial Intelligence (AI), Climate Change Monitoring, Greenhouse Gas Emissions, IoT Environmental Sensors, Predictive Analytics and Sustainability

12. LOG BOOKS AND NOTEBOOKS: Please provide log books and note books with date when the idea was discussed with your team.