AI IN CLIMATE CHANGE

> "Optimism is the faith that leads to achievement. Nothing can be done without hope and confidence." — Helen Keller

AI: THE DATA ENGINE FOR CLIMATE ACTION

The global challenge of climate change demands tools capable of processing vast, complex data streams. This is where Artificial Intelligence (AI) moves from a theoretical concept to a critical operational technology. At its core, AI provides unparalleled capability for observing the planet at scale, building highly accurate models of interconnected environmental systems, and making robust predictions about future climate scenarios. Ultimately, this predictive power is essential for effective risk management—allowing policymakers, engineers, and companies to proactively plan, adapt, and build resilience against climate impacts, a field increasingly driven by data scientists specializing in this high-stakes domain.

Climate Data

DESTINATION EARTH

A DIGITAL REPLICA OF OUR PLANET

Destination Earth [DestinE] aims to develop a highly accurate digital model of Earth to monitor the effects of natural and human activity ou our planet, anticipate extreme events and adopst polices to climate-related challenges.

ECMWF esa EUMETSAT

DESTINATION EARTH (EUROPEAN UNION)

Destination Earth is one of the most ambitious digital projects globally, aiming to build a digital twin of the entire planet. This ultra-high-resolution simulation environment will combine massive datasets with advanced modeling to simulate climate evolution and the impact of mitigation strategies. The goal is to provide planners with a virtual testing ground for resilience measures, enabling better infrastructure design and resource management under various climate futures.

CLIMSIM-ONLINE: HYBRID ML-PHYSICS

Traditional climate models are computationally expensive, making rapid scenario testing impractical. ClimSim-Online addresses this by using a hybrid Machine Learning (ML) and physics-based approach. ML models are trained on the detailed output of full-physics simulations to create highly efficient surrogates. This significantly speeds up climate scenario testing, allowing researchers to quickly explore thousands of "what-if" scenarios, which is crucial for agile policy and risk analysis.

TIPPING POINT EARLY WARNING (UK ARIA)

A climate tipping point is a critical threshold where a small change can lead to a large, irreversible shift in the climate system (e.g., the collapse of the Atlantic Meridional Overturning Circulation). This initiative uses advanced time-series analysis and ML to detect subtle, pre-cursor signals in climate data that suggest a tipping point may be approaching. Providing this early warning is key for proactive and global-scale adaptation planning.

STORM SURGE SURROGATE MODELS

Surrogate modeling is also transforming natural hazard prediction. Storm Surge Surrogate Models utilize simplified, yet highly accurate, ML models trained on complex hydrodynamic simulations. These surrogates can generate rapid flood and storm surge predictions in seconds rather than hours. This capability is critical for improving the effectiveness and lead time of early warning systems for coastal communities, directly saving lives and minimizing economic damage.

PUSHING THE BOUNDARIES: KEY AI-DRIVEN CLIMATE PROJECTS

- The AlphaEarth Foundations initiative, a powerful collaboration between DeepMind and Google, is fundamentally transforming environmental monitoring by creating unprecedented global Earth maps and developing cutting-edge foundational models of the planet.
- The project leverages advanced Artificial Intelligence to process vast quantities of satellite imagery and diverse environmental datasets. This AI proficiency allows AlphaEarth to excel at automatically detecting fine-grained changes in land cover with near real-time precision.
- Crucial applications include the precise monitoring of deforestation, identification of elusive illegal mining operations, and tracking of rapid urban expansion across the globe. By providing environmental auditors and researchers with objective, continuously updated data,
- AlphaEarth equips them with the essential intelligence for effectively enforcing sustainability policies. Ultimately, this DeepMind/Google effort moves beyond traditional monitoring to provide a dynamic, digital understanding of our planet, accelerating global efforts to combat climate change and environmental degradation.
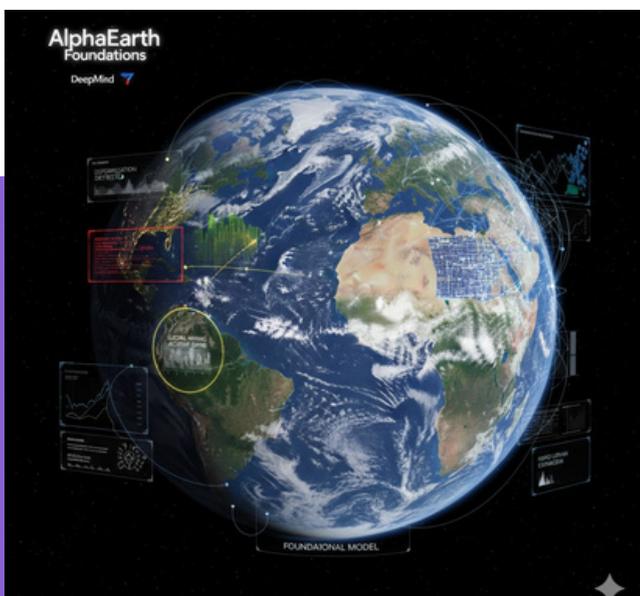
AlphaEarth Foundations (DeepMind/Google)

SPOTLIGHT ON A CLIMATE AI PIONEER

Himanshu Gupta, Co-founder of ClimateAI
Himanshu Gupta co-founded ClimateAI with the mission to build global resilience through data science. His work centers on delivering AI-driven climate resilience solutions to the enterprise level, specifically helping companies across agriculture, energy, and supply chain management assess their climate-related risks. By translating complex climate data into actionable business insights (like predicting crop yields or insurance risks), Gupta exemplifies how data science expertise is directly applied to managing financial and operational risk in a climate-challenged world.

CRITICAL PERSPECTIVE: THE CARBON COST OF COMPUTATION

While AI offers powerful solutions, its development is not without environmental cost. The training of large-scale AI models, particularly deep neural networks, requires significant computational resources, leading to a substantial carbon footprint and high energy consumption. This presents a critical paradox: the very technology designed to help manage the climate crisis is also contributing to it. Data scientists and engineers must therefore prioritize lifecycle sustainability in their work, focusing on efficient model architectures, leveraging energy-efficient hardware, and exploring techniques like "Green AI" to ensure the environmental solution doesn't become another part of the environmental problem.

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FOCUS ON INNOVATION AND APPLICATION

Vidyavardhini's College of Engineering and Technology (VCET) successfully hosted two major technical events in September 2025, reinforcing its focus on applied skills and industry linkage.

On September 13, the Departments of AI&DS and CSE(DS) organized Code-O-Fiesta 2025. This hackathon provided a platform for 55 participating teams (internal and external) to solve real-world problems across AI and IoT domains. Chief Guest Mr. Atul Vasaikar encouraged participants to embrace technical innovation. The competition concluded with Null Pointers winning the AI Domain and Bit By Bit securing the IoT Domain title, showcasing excellent execution and problem-solving abilities.

This focus on practical application continued with the Product Vidya General Exhibition on September 19. The event successfully bridged academic knowledge with industry practice, drawing 350 visitors and featuring 102 student participants. It showcased over 20 diverse products and companies, ranging from Smart Home Automation and Electric Bicycles to Data Visualization Tools. The exhibition provided students with valuable hands-on experience, networking opportunities, and direct insights into career prospects, underscoring VCET's commitment to fostering future-ready technologists.

We are immensely proud to announce a superb victory! Our dedicated student, Ms. Devanshi Solanki, has clinched the Silver Medal in the prestigious University of Mumbai Intercollegiate Chess Tournament for the Suburban Zone. Chess demands sharp strategy and intense focus, and securing the second position among the top collegiate players is a phenomenal accomplishment. Devanshi's hard work brings great honour to our institution.

STUDENT ACHIEVEMENTS

TOPPERS

SEM 4	DRASHTI PARMAR – 10
	SNEHA THAKUR – 9.92
	ARNAV GUPTA – 9.88
SEM 6	AHMED ANSARI – 10
	SOHAM SHIVPUJE – 9.61
	SAMIKSHA JAGNE – 9.43
SEM 8	VIRAJ WADKE – 10
	DHANASHREE THAKUR – 9.86
	NISHA JHA – 9.86

PLACEMENTS

Siddharth Chakravarty from BE (CSEDS) has been selected in Zeus Learning with 7.80 LPA package.

Three copyrights were registered in January 2025:
- "Visualizing & Forecasting Stocks Using XGBoost" Authors: Swayam Raut, Pranavakumar Murali, Ruturaj Patil, Ms. Maya Varghese, Ms. Janisa Pereira
- "A CNN Algorithm Based Deepfake Detection Model" Authors: Meetkumar Mistry, Aditya Pal, Swapnil Mangalampalli, Ms. Janisa Pereira, Ms. Komal Champanerkar
- "Study Guide: Comprehensive Resources for Students" Authors: Sakshi Vishwakarma, Priya Yadav, Sahil Rahatwal, Sanika Uttekar, Ms. Janisa Pereira

Team Yantrika Excels at Technoxian 9.0

Team Yantrika from the CSE (Data Science) Department secured 3rd place in the Fastest Line Following Competition at the World Robotics Championship – Technoxian 9.0, held in Noida from August 30 to September 2, 2025. Competing against top institutions from India and abroad, the team impressed judges with their innovation, precision, and teamwork, skillfully navigating the challenging track with speed and accuracy.

TEAM MEMBERS FROM CSE(DS):

Eshika Agarwal (TE)
Taniksha Desale (TE)
Siddharth Dongardive (TE)
Abhijeet Haldar (SE)
Vallari Panvalkar (SE)
Yash Kute (SE)

FACULTY ACHIEVEMENTS

- Dr. Yogesh Pingle successfully completed his PhD in Computer Engineering
- Dr. Yogesh Pingle worked in the NEP Syllabus Committee of the University of Mumbai for the "Full Stack Java Programming" syllabus for Semester 3.
- Dr. Yogesh Pingle is working as a member of the PBOS Committee in the Electronics Department at Government Polytechnic College, Bandra.
- Copyright has been published by Ms. Maya Varghese and Ms. Janisa Pereira
- Mr. Ichhanshu Jaiswal, Ms. Krunali Vartak, and Ms. Anjali Pardeshi are pursuing PhD.
- Ms. Janisa Pereira, Ms. Maya Varghese, Ms. Krunali Vartak, and Mr. Ichhanshu Jaiswal have successfully completed NPTEL courses.
- Ms. Kranti Gule and Mr. Ichhanshu Jaiswal have completed AICTE Training And Learning (ATAL) Academy Faculty Development Program on GenAI and Agentic AI: The Future of Intelligent Systems.
- A certificate has been awarded to Mr. Ichhanshu Jaiswal for successfully completing the online workshop on Signal classification using Deep learning.
- This certificate has been awarded to Mr. Ichhanshu Jaiswal for successfully completing the online workshop signal classification using long short-term memory networks
- Ichhanshu Jaiswal presented a paper on Machine Learning for Schizophrenia EEG Analysis at the IC3IA 2025 conference.
- The Academic Audit for the academic year 2024–2025 has been successfully conducted for the Department.

EXPERT TALK ON SIH BY AMBIKA SANAP

On February 4, 2025, the department hosted an Expert Talk titled "SIH Mentor: Guidance for SIH 2025," delivered by Ms. Ambika Sanap, Associate Engineer at MorningStar Inc. The session was introduced by Mr. Ichhanshu Jaiswal and aimed to equip students with strategies for successful participation in the Smart India Hackathon (SIH). Ms. Sanap's guidance focused heavily on the initial crucial steps of the competition. She detailed how to choose a problem statement wisely, emphasizing aligning the selection with the team's capabilities, understanding, and the expected outcomes of the SIH.

Critical advice was given on preparing the presentation (PPT): it must be descriptive yet short, significantly presenting the idea and approach. She stressed using flow charts to explain the workflow, detailing the components used (back-end/front-end), and highlighting the project's benefits, security, and authentication methods.

DATACITE: NEWSLETTER TEAM

FACULTY CO-ORDINATOR - MS. LEENA RAUT
NEWSLETTER HEAD - SIDDHARTH CHAKRAVARTY

CHIEF EDITOR –   CREATIVE DIRECTOR –
ARNAV GUPTA   TANIKSHA DESALE
KARAN DOSHI   SUNNY GUPTA

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OUR DEPARTMENT HAS SUCCESSFULLY CONDUCTED FDP ON "TRANSFORMING TEACHING: NEP 2020 AND OBE STRATEGIES FOR INCLUSIVE EDUCATION"

From June 30 to July 5, 2025, the Departments of Computer Science and Engineering (Data Science) and Artificial Intelligence & Data Science at VCET jointly organized an ISTE-Approved Faculty Development Program titled "Transforming Teaching: NEP 2020 and OBE Strategies for Inclusive Education."
The week-long FDP aimed to modernize pedagogy in alignment with national reforms. Sessions focused on the principles and practical implementation of NEP 2020 and Outcome-Based Education (OBE), with experts guiding faculty in effective curriculum design, course file preparation, and assessment strategies.
Highlights included Dr. Ashish Chaudhari's session on Research Policies and Dr. Tatwadarshi P.N.'s demonstration on Leveraging AI for Research, showcasing how AI tools enhance research efficiency and insight. The program concluded with a session on Sustainability and Decision-Making Dynamics at Gowardhan Eco Village, offering a holistic learning experience for all participants.

INDUSTRIAL VISIT: AI APPLICATION AT SCOGO NETWORK

On September 26, 2025, 24 students from the CSE (Data Science) Department, Semester V, undertook an industrial visit to SCOGO Network (AI) in Navi Mumbai, coordinated by Mr. Ichhanshu Jaiswal and Ms. Odilia Gonsalves.
The core of the visit was a detailed session led by Mr. Taha Bootwala, Senior AI Engineer, and Mr. Naman Agarwal. They highlighted SCOGO's focus on developing AI-powered solutions to minimize human effort in managing installation and AMC services, particularly through an AI-based routing mechanism.

Students gained critical insights into the company's evolving technology stack, which has transitioned from PHP/SQL to modern frameworks like Next.js, PostgreSQL, and Python. The session detailed advanced AI features, including the use of AI Agents for prioritizing customer issues and a Large Language Model (LLM)-based tool for real-time data fetching. Crucially, the team explained their three-step process for audio and chatbot technology—ASR, translation, and response generation—along with the necessity of a Master Agent system to prevent AI hallucinations. This visit provided invaluable practical exposure to Agentic AI and real-world data security priorities.