

AI&DS INSIGHTS

JANANI

The origin of life.

JANMABHUMI

The ground that sustains it.

SWARGADAPI

Even more than paradise.

GARIYASI

Beyond all greatness.

**#Word Of The
Month**

AI Slop

“AI slop” is the new term for low-quality, mass-produced content generated by AI that clutters social media feeds and search results.

#Student Achievements



“First Place In Hack Matrix 4.0”

Team Jhatpat secured 1st place at Hack Matrix 4.0, a national-level 24-hour hackathon by GFG PCCOE, Pune, in the Health, Lifestyle, and Personal Well-being track, winning a ₹10,000 cash prize. The team: Srushti Rokade (SY AIDS), Raj Kakade (TY AIML), Nikita Kapse (TY IT), and Jay Paunikar (TY CS) brought pride to the department with their innovative solution.



Victory at Odoo×GCET 24-Hour Hackathon

We are proud to announce that Sanskar Kulkarni (TY AIDS) and Adwyte Karandikar (TY CSE – AIML) secured 1st place at the National Odoo × GCET 24-Hour Hackathon, a highly competitive event with participation from 1000+ teams across India. Demonstrating exceptional innovation, technical expertise, and teamwork under intense time constraints, the team emerged as national winners and was awarded a ₹45,000 cash prize, bringing significant recognition to the department.

#Student Achievements

INTELLECTICA'26

“Shruti Dwivedi and Shankar Jadhav secured First Runner-Up at Intellectica'26, held on 16th January 2026, representing Germany on the theme “Ensuring Ethical Data Sovereignty in the Age of AI, Cloud, and IoT.” The team received special recognition from the jury for their clarity, conviction, and depth of argument, marking a commendable achievement at a competitive national platform.”



IIT MADRAS: Appian AI Application Challenge' 26

The team: Rushikesh Godase (TY-A), Shivam Sawant (TY-C), Ashish Shadija (TY-C), and Rohan Shrirame (TY-C) secured 2nd place at the National-Level Appian AI Application Challenge 2026, held at IIT Madras on 6th January 2026, and won a ₹30,000 cash prize in the Technical category. Hence, demonstrated strong technical expertise, innovation, and teamwork, bringing pride to the department and the institute.



#Faculty Article

Prof. Sanjivani Adsul

**Assistant Professor
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EXPLAINABLE AI (XAI): BUILDING TRUST IN MACHINE LEARNING MODELS

Introduction

Artificial Intelligence (AI) and Machine Learning (ML) models are increasingly being adopted across diverse domains such as healthcare, finance, autonomous systems, and education. These models assist in making predictions, classifications, and automated decisions that directly impact human lives. Despite their high accuracy and performance, many advanced machine learning models especially deep learning models operate as black boxes, meaning their internal decision-making processes are difficult for humans to understand.

Explainable Artificial Intelligence (XAI) addresses these challenges by enabling humans to understand, interpret, and trust AI model decisions. XAI techniques provide meaningful insights into how models arrive at their predictions by explaining the relationship between inputs and outputs. This bridges the gap between complex algorithms and human reasoning. By making AI systems more transparent and interpretable, XAI empowers stakeholders such as doctors, financial analysts, engineers, policymakers, and educators to validate AI outcomes, identify potential errors or biases, and make informed decisions. As AI systems continue to influence real-world processes, Explainable AI plays a crucial role in ensuring responsible, transparent, and trustworthy deployment of machine learning models.

This lack of transparency raises serious concerns related to trust, accountability, fairness, and ethical decision-making. When users cannot understand why a model produces a particular output, it becomes challenging to rely on AI systems in sensitive or high-stakes applications.

NEED FOR EXPLAINABLE AI

The rapid growth and widespread adoption of AI systems have made explainability a critical requirement rather than an optional feature. The key reasons for the need for Explainable AI include:

- **Increased trust and user confidence:** Users are more likely to trust AI systems when they understand how decisions are made.
- **Accountability in critical decision-making:** In domains like healthcare and finance, explanations are necessary to justify decisions and assign responsibility.
- **Detection and reduction of bias:** Explainability helps uncover biased patterns in data or models, enabling fairer outcomes.
- **Compliance with ethical and regulatory standards:** Regulations increasingly require transparency and justification of automated decisions.

Key Principles of XAI

Explainable AI is built upon several fundamental principles that guide its development and application:

- **Transparency:** Providing visibility into how the model works and how decisions are generated.
- **Interpretability:** Ensuring that humans can understand how changes in input features influence the output.
- **Fairness and Ethics:** Identifying and mitigating biased or unfair predictions to promote ethical AI use.
- **Human-Centric AI:** Designing AI systems that support and enhance human decision-making rather than replacing it.

Explainability Techniques

- **Inherently Interpretable Models:**

Linear models, decision trees, rule-based systems

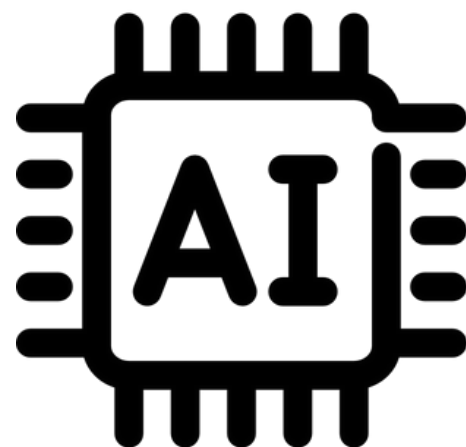
- **Post-Hoc Methods:**

LIME for local explanations

SHAP for feature contribution analysis

- **Visualization Tools:**

Feature importance plots and model behavior graphs



APPLICATIONS OF XAI

Explainable AI has significant practical applications across multiple domains:

- **Healthcare:** Enhances trust in disease prediction models and supports interpretable diagnosis and treatment planning.
- **Finance:** Enables transparent credit scoring, loan approval, and fraud detection systems.
- **Autonomous Systems:** Improves safety and reliability by making autonomous decisions understandable.
- **Education:** Helps educators interpret student performance analytics and learning outcomes.



Academic & Industry Relevance

Explainable AI plays a vital role in responsible AI development and is increasingly demanded by industry and regulatory bodies. For AI and Data Science students, XAI enhances conceptual clarity, promotes ethical awareness, and prepares them for real-world AI deployment challenges. It bridges theoretical machine learning concepts with practical, transparent, and accountable system design.

Conclusion

Explainable AI is essential for building trustworthy, fair, and transparent machine learning systems. As AI continues to influence critical decisions, XAI will play a central role in ensuring responsible and human-aligned artificial intelligence.

#Student Article

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EDGE AI

BRINGING INTELLIGENCE CLOSER TO DEVICES

Artificial Intelligence has traditionally relied on cloud computing, where data is sent to powerful remote servers for processing. While this approach has enabled many intelligent applications, it also introduces challenges such as latency, high bandwidth usage, and privacy risks. Edge AI addresses these limitations by enabling AI models to run directly on local devices, closer to where data is generated.

Edge AI represents a shift in computing, allowing machines to make decisions in real time without constant dependence on cloud infrastructure.

WHY EDGE AI IS NEEDED

Modern digital systems generate massive amounts of data from sensors, cameras, microphones, and connected devices. Sending all this data to the cloud for analysis can be slow, expensive, and unreliable, especially in environments with limited internet connectivity.

Edge AI processes data locally on devices such as smartphones, embedded systems, industrial controllers, and IoT nodes. This reduces latency, improves response time, and ensures continuous operation even when network connectivity is weak or unavailable.

How Edge AI Works

In an Edge AI system, data is collected from local sensors and immediately processed using an AI model deployed on the device. Instead of transmitting raw data to the cloud, the device performs inference locally and produces results such as predictions, classifications, or alerts.

Only essential information, such as system logs or summarized insights, may be sent to the cloud for storage or further analysis. This architecture minimizes data transfer and improves overall system efficiency.

ADVANTAGES OF EDGE AI

One of the major benefits of Edge AI is real-time decision making. Applications such as autonomous systems, healthcare monitoring, and industrial automation require instant responses, which Edge AI enables by eliminating cloud-related delays.

Edge AI also enhances data privacy and security. Since sensitive data is processed locally, the risk of data exposure during transmission is significantly reduced. Additionally, it lowers bandwidth consumption and operational costs by minimizing cloud usage

APPLICATIONS OF EDGE AI

Edge AI is widely used across various industries.

In healthcare, wearable devices and medical equipment analyze patient data locally to detect anomalies and provide immediate alerts. In manufacturing, Edge AI enables predictive maintenance by monitoring machine behavior and identifying faults in real time.

Smart cities use Edge AI in traffic management systems, surveillance cameras, and energy grids to optimize operations efficiently. Consumer electronics such as smartphones, smart cameras, and voice assistants rely on Edge AI for faster and more personalized user experiences.

In agriculture, edge-based systems analyze soil conditions, weather data, and crop health directly in the field, helping farmers make timely decisions.

CHALLENGES IN EDGE AI

Despite its advantages, Edge AI faces certain challenges. Edge devices often have limited processing power, memory, and energy resources, requiring AI models to be highly optimized.

Deploying and updating AI models across thousands of distributed devices can also be complex. Security remains a concern, as edge devices may be physically accessible and vulnerable to attacks if not properly protected.

FUTURE SCOPE OF EDGE AI

The future of Edge AI is driven by advancements in efficient hardware, optimized AI models, and better integration with cloud systems. Techniques such as model compression and hardware acceleration are making it easier to deploy powerful AI capabilities on edge devices.

Conclusion

Edge AI is transforming the way artificial intelligence is deployed by bringing computation closer to data sources. By enabling real-time processing, improving privacy, and reducing reliance on cloud infrastructure, Edge AI is becoming essential for modern intelligent systems.

As technology evolves, Edge AI will remain a key enabler of smart, efficient, and responsive applications across multiple domains.

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