



ST. ANN'S COLLEGE OF ENGINEERING & TECHNOLOGY

- CHIRALA



NBA | AUTONOMOUS | NAAC WITH 'A' GRADE



NEURON

...DEPARTMENT TECH-MAGAZINE

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DEPARTMENT OF CSE-ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

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Vision of the Institute



To develop St. Ann's College of Engineering & Technology into an Institution of Global standards catering to the educational needs of students and also contribute to the welfare of local Community.

Mission of the Institute



"To nurture students with sound engineering knowledge in the field of AIML through effective use of modern tools with a focus on imbibing professionalism, leadership qualities, ethical attitude, lifelong learning and social sensitivity."



Vision of the Department

To build the Department of CSE - Artificial Intelligence and Machine Learning into a Centre of Excellence that nurtures globally competent professionals, advances innovative research, and delivers AI-driven solutions for societal and local community development.

Mission of the Department

M1: To impart quality education in CSE - Artificial Intelligence and Machine Learning through innovative teaching - learning processes and a curriculum aligned with global standards.

M2: To promote continuous faculty development, interdisciplinary research, consultancy, and industry-institute interaction in emerging areas of Artificial Intelligence.

M3: To equip students with strong analytical, programming, and problem solving skills through experiential learning, enabling academic excellence and professional competence.

M4: To inculcate ethical values, social responsibility, and the application of Artificial Intelligence technologies for sustainable development and societal welfare.

Program Educational Objectives

PEO 1: To empower graduates to apply fundamental engineering concepts and Artificial Intelligence and Machine Learning principles to analyze, design, and implement effective solutions for complex real world problems.

PEO 2: To prepare graduates with advanced technical skills and professional competence to excel in careers and innovative projects in Artificial Intelligence and Machine Learning.

PEO 3: To nurture graduates with an entrepreneurial mindset, ethical awareness, teamwork and communication skills, and lifelong learning abilities to contribute effectively to society and national economic development.

Program Specific Outcomes

PSO 1:

Apply core principles of computer science and engineering to design, develop, and evaluate intelligent computing systems using Artificial Intelligence, Machine Learning, Deep Learning, and Data Analytics for real world applications.

PSO 2:

Analyze and process structured and unstructured data to build, optimize, and deploy end-to-end AI&ML solutions using modern tools, frameworks, cloud platforms, and engineering practices.

PSO 3:

Apply ethical, transparent, secure, and socially responsible practices in the development, deployment, and use of AI and ML technologies.



Program Outcomes

PO1: Engineering Knowledge: Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop to the solution of complex engineering problems.

PO2: Problem Analysis: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1 to WK4)

PO3: Design/Development of Solutions: Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required. (WK5)

PO4: Conduct Investigations of Complex Problems: Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions. (WK8).

PO5: Engineering Tool Usage: Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems. (WK2 and WK6)

PO6: The Engineer and The World: Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment. (WK1, WK5, and WK7).

PO7: Ethics: Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws. (WK9)

PO8: Individual and Collaborative Team work: Function effectively as an individual, and as a member or leader in diverse/multi- disciplinary teams.

PO9: Communication: Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences

PO10: Project Management and Finance: Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.

PO11: Life-Long Learning: Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change. (WK8)

MESSAGE FROM SECRETARY

It is encouraging to witness the enthusiasm and talent of students reflected through this magazine. Such publications play an important role in promoting creativity, communication, and intellectual growth among students. Our institution always supports activities that help students develop both academically and personally. I appreciate the dedication of the editorial team for bringing out this magazine. I wish all students continued success in their future endeavors. May they achieve great heights in their careers.



V. Rama Krishna Rao

SECRETARY

MESSAGE FROM CORRESPONDENT



A college magazine is a mirror that reflects the thoughts, talents, and achievements of its students. It provides a valuable opportunity for young minds to share their creativity and ideas with the academic community. I congratulate the team behind this publication for their sincere efforts and commitment. I hope this magazine encourages students to think creatively and express themselves confidently. I extend my best wishes for the continued success of this publication. May it inspire many more students in the future.

S. Lakshmana Rao

CORRESPONDENT

MESSAGE FROM DIRECTOR

Education is not only about acquiring knowledge but also about developing creativity, leadership, and confidence. This magazine serves as a wonderful platform for students to showcase their ideas and achievements beyond academics. I congratulate the students and faculty who have contributed their efforts to make this publication successful. I hope this magazine motivates students to explore their potential and strive for excellence. My best wishes to everyone involved in this initiative. May this publication continue to grow in the years ahead.



Dr. C. S. Rao
DIRECTOR(ARD)

MESSAGE FROM PRINCIPAL

It gives me great pleasure to present this edition of our college magazine, which reflects the creativity, talent, and achievements of our students. The magazine serves as a valuable platform for expressing innovative ideas, academic excellence, and artistic abilities. I sincerely appreciate the dedicated efforts of the editorial team and all contributors in bringing out this publication. I hope this magazine inspires every student to explore their potential and strive for excellence. Wishing all our students a bright and successful future.



Dr. K. JAGADEESH BABU
Principal

(PhD, Post-doc, IIT KGP, SMIEEE)

MESSAGE FROM HOD



Dr. HARI KISHAN CHAPALA
PROFESSOR & HOD

It is a great pleasure to see the release of this magazine, which highlights the creativity and talents of our students. Such platforms encourage students to express their ideas, knowledge, and innovative thinking. As the Department of CSE-AI&ML, we focus on preparing students to face technological challenges with confidence and responsibility. I appreciate the hard work of the editorial team and contributors. May this magazine inspire everyone to continue learning and achieving excellence. I wish all the students success in their academic journey.

MESSAGE FROM EDITOR

It is a matter of great pride and pleasure to present this edition of our college magazine. This publication is a collective effort that showcases the creativity, ideas, and achievements of our students. It serves as a platform for young minds to express their thoughts, talents, and innovations. I extend my sincere gratitude to all contributors and the team members whose dedication made this possible. I hope this magazine engages, inspires, and motivates every reader to explore their potential.



Dr. PS. NAVEEN KUMAR
ASSOCIATE PROFESSOR



Technical articles

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Expert System for Medical Diagnosis

Expert Systems simulate human decision-making using artificial intelligence. They are designed to provide expert-level advice in specific domains.

Expert System:

It consists of a knowledge base and inference engine. The knowledge base stores facts and rules, while the inference engine applies these rules to analyze user input and provide recommendations.

Example:

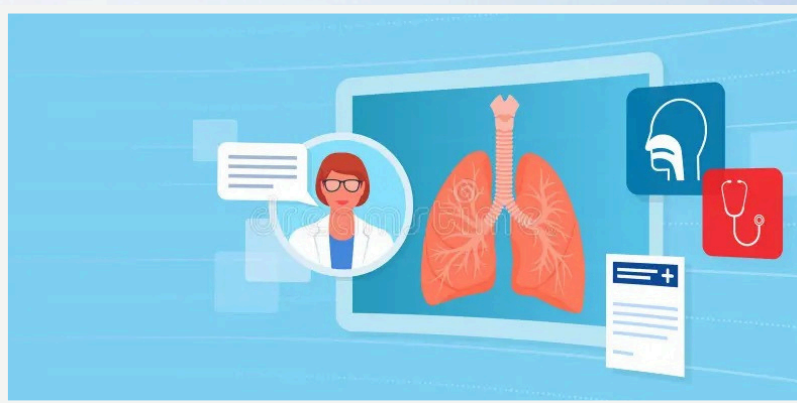
A patient inputs symptoms like fever, cough, and headache. The system uses its knowledge base to suggest possible diseases and recommended actions.

Applications:

Healthcare diagnosis, technical troubleshooting, customer support, decision support systems.

Conclusion:

Expert Systems assist professionals by providing intelligent advice and recommendations based on stored knowledge.



PUTTA SIRI
23F01A4248

Intelligent Traffic Management System

Artificial Intelligence uses real-time data to manage traffic efficiently in urban areas. AI systems help reduce congestion, improve road safety, and optimize signal timings.

Traffic Management:

AI collects data from cameras, sensors, and GPS devices to analyze traffic flow. Based on this information, it adjusts traffic signals, manages lanes, and redirects vehicles to reduce jams.

Example:

If a road becomes congested, the system can extend the green light duration or suggest alternate routes to balance traffic on surrounding roads.

Applications:

Smart city traffic control, transportation planning, emergency vehicle prioritization, traffic monitoring centers.

Conclusion:

AI-based traffic management improves travel efficiency, reduces congestion, and makes urban transportation safer and more responsive



VALLAMSETTY GNANA SAI DEEPIKA
24F01A4261

AI-Based Fraud Detection System

Artificial Intelligence is used to detect fraud by analyzing patterns in financial transactions. It helps identify suspicious activities quickly and accurately.

Fraud Detection:

AI models learn normal transaction behaviors and flag unusual activity, such as large transfers, foreign usage, or rapid consecutive spending.

Example:

If a credit card is used in two different countries within minutes, the system flags the transaction as potentially fraudulent.

Applications:

Banking security, online payments, insurance claims, e-commerce transaction monitoring.

Conclusion:

In conclusion, AI-based fraud detection protects financial systems by identifying suspicious activities early, reducing losses, and improving overall security.



MEESALA PAVAN KUMAR
22F011A4235

Autonomous Robot Navigation

Artificial Intelligence enables robots to navigate environments without human control by analyzing sensor data and making decisions in real-time.

Robot Navigation:

Robots use AI to process information from sensors like cameras, LiDAR, or ultrasonic devices. They detect obstacles, map surroundings, and plan safe paths to reach their goals.

Example:

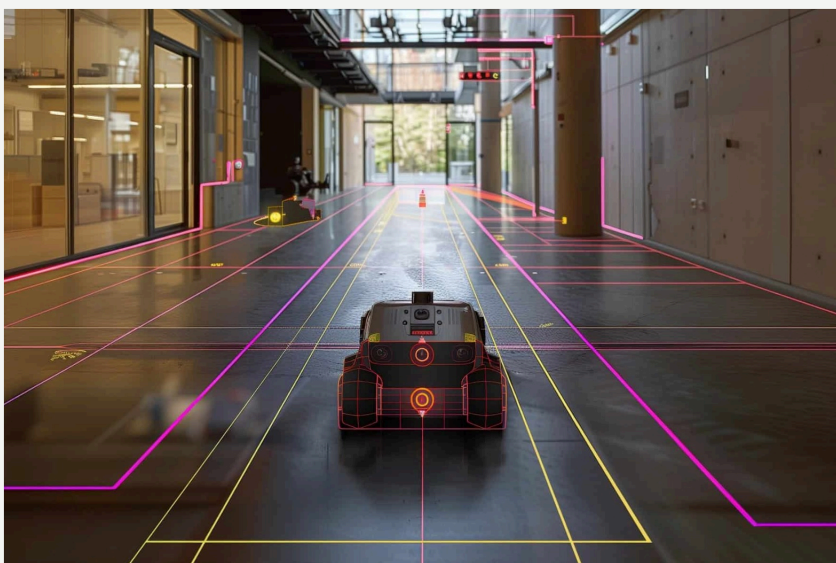
A robot vacuum cleaner senses walls, furniture, and objects, adjusting its path to clean efficiently without collisions.

Applications:

Warehouse robots, delivery robots, self-driving vehicles, exploration robots.

Conclusion:

In conclusion, autonomous robot navigation allows machines to operate independently, improving efficiency, safety, and adaptability in complex environments.



**PUSHADAPU GNANA
LAKSHMI PRASANNA
22F01A4248**

Aircraft Maintenance Prediction using Machine Learning

Aircraft Maintenance Prediction using Machine Learning

Aircraft Maintenance Prediction is a machine learning project that helps airlines detect potential aircraft faults before they occur. By analyzing sensor data and maintenance records, the system can predict when a component may fail and schedule maintenance in advance.

Aircraft Maintenance Prediction:

In this project, data from aircraft sensors such as engine temperature, vibration levels, fuel consumption, and flight hours are collected. Machine learning models analyze this data to identify patterns that indicate possible equipment failure. This helps airlines perform preventive maintenance instead of waiting for a problem to occur.

Example:

If the system detects unusual vibration patterns in an aircraft engine, it predicts a possible engine fault. The airline can then schedule maintenance before the issue becomes serious, preventing unexpected breakdowns.

Applications:

Airline safety monitoring, predictive aircraft maintenance, flight performance analysis, aviation safety systems.

Conclusion:

In conclusion, aircraft maintenance prediction using machine learning helps improve aviation safety, reduce maintenance costs, and prevent unexpected equipment failures by identifying potential problems early.



SOMA BHAVYA SRI
22F01A4258

Anomaly Detection in Industrial Equipment using Autoencoders

Autoencoders are unsupervised neural networks used for dimensionality reduction and anomaly detection. The network learns to reconstruct normal operation patterns of equipment. Any significant deviation from the reconstruction indicates a potential fault or anomaly.

Example:

Monitoring turbine vibrations in a power plant. The autoencoder learns normal vibration patterns and flags unusual spikes or changes as potential equipment malfunctions, preventing downtime.

Applications:

Predictive maintenance in manufacturing

Fault detection in engines and turbines

Network intrusion detection

Monitoring IoT devices

Conclusion:

Autoencoder-based anomaly detection helps industries prevent failures, reduce maintenance costs, and ensure operational safety by learning patterns of normal behavior and automatically identifying deviations.



MANCHAMCETTI LAKSHMI BHAVANI
24F01A4233

Medical Image Segmentation using U-Net

U-Net is a convolutional neural network architecture designed specifically for image segmentation. It identifies and isolates regions of interest (like organs, tumors, or lesions) in medical images such as CT scans or MRIs. The “U” shape enables the network to capture both low-level details and high-level features.

Example:

Segmenting brain tumors from MRI scans to help doctors visualize tumor boundaries for surgical planning. The network outputs a mask highlighting tumor regions.

Applications:

Tumor detection in radiology

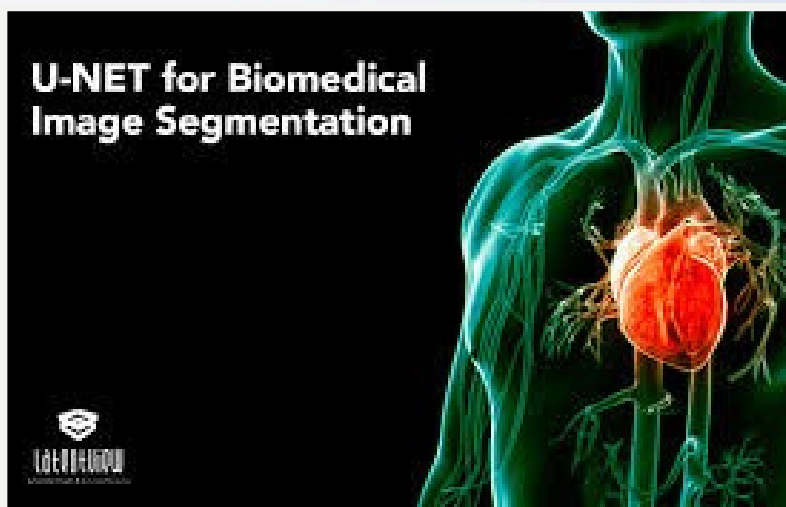
Retinal blood vessel segmentation for ophthalmology

Organ segmentation for pre-surgical planning

Automated analysis in pathology

Conclusion:

U-Net and its variants have revolutionized medical imaging, providing precise segmentation and assisting doctors in accurate diagnosis, treatment planning, and monitoring of diseases.



SURAGANI TARAKA NAGANJALI
22F01A4259

Deepfake Video Detection using Convolutional Neural Networks

Deepfake detection uses CNNs to analyze subtle inconsistencies in video frames, such as unnatural facial movements or artifacts. These networks learn to distinguish between authentic and manipulated content.

Example:

A system scans video footage to detect deepfake content in news or social media platforms. It identifies irregular blinking patterns, face warping, or lighting inconsistencies to flag potentially fake videos.

Applications:

Social media content verification

Law enforcement and forensics

Misinformation and fake news detection

Cybersecurity awareness

Conclusion:

CNN-based deepfake detection helps protect digital media integrity, combats misinformation, and ensures that video content remains trustworthy and secure.



KANDRAPU L V TARUN TEJA REDDY
24F01A4218

Sentiment Analysis

Sentiment Analysis is a technique in Natural Language Processing (NLP) used to determine the emotional tone of text. It helps identify whether a piece of text expresses positive, negative, or neutral feelings.

Sentiment Analysis:

Sentiment Analysis works by analyzing words, phrases, and context in the text to determine the sentiment. Machine learning algorithms are often used to classify the text based on its emotional meaning.

Example:

A product review saying “This phone is excellent and easy to use” will be classified as positive sentiment.

Applications:

Customer feedback analysis, social media monitoring, product reviews, brand reputation analysis.

Conclusion:

In conclusion, sentiment analysis helps organizations understand people's opinions and emotions from large amounts of text data.



KAVURI GIRIJESWARI
23F01A4224

Video Captioning using Encoder-Decoder Deep Learning Models

Video captioning uses deep learning to generate textual descriptions of video content. An encoder (usually a CNN or 3D-CNN) extracts spatial and temporal features from frames, and a decoder (usually an LSTM or Transformer) generates natural language captions.

Example:

Generating descriptions for a sports video, e.g., “A player kicks the ball and scores a goal.” This helps in creating automated highlights for broadcasting or content indexing.

Applications:

Automated video summarization for media platforms

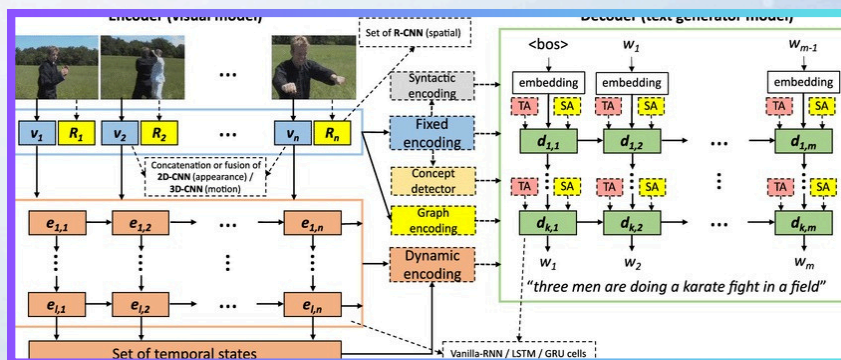
Accessibility support for visually impaired users

Surveillance and security monitoring

Content recommendation systems

Conclusion:

Encoder-decoder models for video captioning combine visual understanding with natural language generation. They bridge the gap between visual and textual data, enabling applications in media, security, and accessibility.



JEERU SRAVANI
22F01A4223

Edge Computing for Real-Time IoT Applications

Edge Computing for Real-Time IoT Applications

Edge Computing is an IoT-based project that processes data closer to the source of data generation instead of sending it to a centralized cloud server. It is useful for applications that require fast responses and real-time decision making.

Edge Computing:

In this project, IoT sensors collect real-time data such as temperature, humidity, or machine status. Instead of transmitting all data to the cloud, an edge device processes the data locally and sends only important information to the cloud. This reduces network delay, bandwidth usage, and improves system performance.

Example:

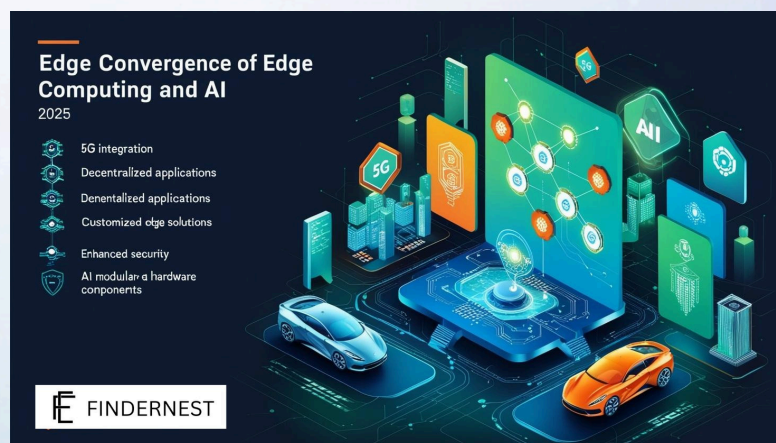
In a smart factory, sensors monitor machine temperature and vibrations. If the temperature exceeds a safe limit, the edge device immediately sends an alert to the system and stops the machine to prevent damage.

Applications:

Smart manufacturing, healthcare monitoring, autonomous vehicles, smart cities, industrial automation.

Conclusion:

In conclusion, edge computing improves the efficiency of IoT systems by enabling faster data processing and reducing network latency for real-time applications.



MADDIBOINA HEMALATHA
23F01A4230

Cybersecurity in Industrial Control Systems (ICS)

Cybersecurity in Industrial Control Systems

Cybersecurity in Industrial Control Systems (ICS) is a project that focuses on protecting industrial systems from cyber attacks and unauthorized access. These systems are used to control critical infrastructure such as power plants and manufacturing systems.

Cybersecurity in ICS:

In this project, security techniques such as intrusion detection systems, network monitoring, and access control are implemented to protect industrial networks. The system continuously monitors data traffic and identifies suspicious activities that may indicate cyber threats.

Example:

In a power plant, the control system manages turbines and electricity distribution. If an attacker tries to access the system, the cybersecurity mechanism detects the unusual activity and blocks the attack.

Applications:

Power plants, manufacturing industries, oil and gas facilities, transportation systems, and water treatment plants.

Conclusion:

In conclusion, cybersecurity in industrial control systems ensures the safety and reliability of critical infrastructure by preventing cyber attacks and protecting sensitive operational data.



KATURI TULASI
22F01A4226

AI-Generated Techno: The Future of Techno Music

AI-Generated Techno:

AI-generated techno uses advanced technologies like Neural Networks and Deep Learning to analyze large datasets of electronic music and automatically create techno tracks. It identifies patterns such as rhythm, tempo, basslines, and synth layers, enabling the generation of high-quality music with minimal human effort. This approach combines computational intelligence with artistic creativity.

Example:

An AI system trained on techno music can generate a complete track including beats and melodies. Tools like AIVA or Google Magenta allow producers to generate loops, adjust tempo, and enhance sound design to produce a professional-quality techno composition.

Applications:

Automated music production, AI-assisted DJ performances, background scores for games and films, personalized music recommendations, virtual music assistants, sound design in multimedia and entertainment industries.

Conclusion:

AI-generated techno is transforming the music industry by making music creation faster, more accessible, and highly innovative. It enables collaboration between humans and machines, opening new possibilities for the future of electronic music.



KOTHA MURALI KRISHNA
24F01A4227

AI in Space Exploration

AI in Space Exploration:

AI in space exploration uses advanced technologies like Neural Networks and Deep Learning to analyze space data, control spacecraft, and assist in autonomous decision-making during missions. It helps scientists process vast amounts of astronomical data efficiently. AI also improves accuracy in detecting patterns, predicting space events, and handling complex computations that are difficult for humans.

Example:

AI-powered rovers on Mars can navigate terrain, avoid obstacles, and collect data without constant human control from Earth. Additionally, AI systems in satellites can automatically identify unusual patterns such as space debris or cosmic events.

Applications:

Autonomous spacecraft navigation, satellite data analysis, space mission planning, asteroid detection, planetary exploration, space weather prediction, real-time decision-making in missions.

Conclusion:

AI is revolutionizing space exploration by enabling smarter missions, reducing human effort, and helping discover new insights about the universe. It plays a crucial role in future missions, including deep space exploration and the search for extraterrestrial life.



**GRANDHI DURGA VENKATA RAMA
MANOJ NAIDU
24F01A4215**

AI in Disaster Management

AI in Disaster Management:

AI in disaster management uses data analysis and predictive models to detect, prevent, and respond to natural disasters. It helps in early warning systems and efficient emergency response. AI can analyze large volumes of real-time data from satellites, sensors, and weather systems to provide faster and more accurate predictions.

Example:

AI systems can analyze weather and seismic data to predict floods, earthquakes, or cyclones, allowing early evacuation. Additionally, AI-powered drones can be used to survey disaster-affected areas and locate survivors.

Applications:

Disaster prediction, emergency response planning, rescue operations, damage assessment, risk analysis, real-time monitoring, resource allocation.

Advantages:

Faster response time, improved accuracy in predictions, reduced human risk, efficient resource management, better coordination during emergencies.

Conclusion:

AI plays a critical role in saving lives and reducing damage by providing accurate predictions and improving disaster response systems. It enhances preparedness and ensures quicker recovery in disaster-affected areas.



ALAVALAPATI VENKATESWARLU
24F01A4201

AI in Ocean Exploration

AI in Ocean Exploration:

AI in ocean exploration uses Machine Learning and robotics to study underwater environments and marine life. It helps analyze ocean data and explore deep-sea regions. AI can process large volumes of sonar, satellite, and sensor data to understand ocean patterns, detect changes, and support scientific research.

Example:

Autonomous underwater robots use AI to navigate deep oceans and collect data on marine ecosystems. In addition, AI systems can identify unknown species and monitor coral reef health using image recognition techniques.

Applications:

Ocean mapping, marine species detection, pollution monitoring, underwater robotics, climate research, deep-sea exploration, disaster monitoring (like oil spills).

Advantages:

Accurate data analysis, ability to explore extreme depths, reduced human risk, continuous monitoring, improved environmental protection.

Conclusion:

AI is expanding our understanding of oceans by enabling deeper exploration and protecting marine ecosystems. It plays a key role in addressing climate change and preserving marine biodiversity.



PARCHURI NAVYA
23F01A4243