

INTERNATIONAL CONFERENCE ON ARTIFICIAL INTELLIGENCE & IOT (ICAIOT 2023)

Organized by :



International Scientific Society
Sharing Knowledge & Wisdom
(An International community for Independent & academic Research Scholars)

"AI EMPOWERS DECISIONS; IOT CONNECTS THE WORLD"



ISSN : 2583-2646

In Association With:



ESP Journal of Engineering & Technology Advancements
International Journal, Scholarly Peer-Reviewed and Published Globally

International Conference on Artificial Intelligence & IOT (ICAIOT 2023)

Proceedings of

ICAIOT 2023

24th November 2023

Organized by



International Scientific Society
Sharing Knowledge & Wisdom
(An International community for Independent & academic Research Scholars)

In Association With



ESP Journal of Engineering & Technology Advancements
International Journal, Scholarly Peer-Reviewed and Published Globally

18/1, VVS Arcade, Puthur High Road
Tiruchirappalli, Tamilnadu, India.
Pincode - 620017

About the Conference

The International Conference on Artificial Intelligence, IoT & Emerging Technologies (ICAIOT–2023) serves as a distinguished global forum dedicated to advancing research, innovation, and knowledge sharing in the fields of Artificial Intelligence (AI), Internet of Things (IoT), Data Science, Machine Learning, Cyber Security, Cloud Computing, Smart Systems, and other emerging technologies. The conference brings together a diverse community of researchers, academicians, scientists, industry experts, technology practitioners, innovators, and students from across the world to discuss the latest developments and future directions in intelligent computing and connected technologies.

ICAIOT–2023 aims to create an interdisciplinary platform that promotes collaboration among universities, research institutions, industries, and technology organizations. By encouraging the exchange of innovative ideas, research outcomes, and practical experiences, the conference contributes to the development of advanced technological solutions that address contemporary societal and industrial challenges. Participants are provided with opportunities to present original research papers, share case studies, demonstrate innovative applications, and engage in meaningful discussions on emerging trends and technological breakthroughs.

The rapid growth of digital technologies has significantly transformed modern industries and everyday life. Artificial Intelligence and IoT, in particular, have emerged as key enablers of digital transformation by enhancing automation, connectivity, efficiency, and decision-making processes. These technologies are increasingly being adopted in sectors such as healthcare, agriculture, education, manufacturing, transportation, finance, environmental monitoring, and smart city development. ICAIOT–2023 recognizes the growing importance of these advancements and focuses on exploring innovative solutions that can contribute to sustainable development, economic growth, and technological progress on a global scale.

The conference covers a broad range of research areas and applications, including Artificial Intelligence, Deep Learning, Machine Learning, Data Analytics, Internet of Things Applications, Cloud and Edge Computing, Cyber Security, Blockchain Technology, Robotics, Intelligent Systems, Embedded Technologies, Industry 4.0, Smart Computing, Digital Transformation, and Intelligent Automation. Through these focus areas, the conference seeks to encourage groundbreaking research and foster the development of next-generation technologies capable of addressing real-world challenges.

ICAIOT–2023 features a comprehensive technical program that includes keynote addresses, invited lectures, technical paper presentations, workshops, tutorials, and panel discussions delivered by internationally recognized researchers, scientists, and industry leaders. These sessions provide valuable insights into emerging technologies, current research challenges, and future opportunities while facilitating academic and professional development among participants.

In addition to its technical contributions, the conference serves as an important networking platform where researchers and professionals can establish collaborations, exchange expertise, and explore potential research partnerships. Young researchers, postgraduate students, and early-career professionals are particularly encouraged to participate, present their work, and gain exposure to global research perspectives and industry expectations.

Through its commitment to academic excellence, innovation, and technological advancement, ICAIOT–2023 aims to strengthen the global research community and support the development of intelligent, secure, and sustainable technological solutions. By bringing together experts from various disciplines and sectors, the conference contributes to the advancement of scientific knowledge and the creation of innovative technologies that can positively impact society and shape the future of the digital world.

Keynote Speakers / Invited Speakers

Dr. Victor Sunday Aigbodon
Professor, Department of Metallurgical and Materials Engineering,
Faculty of Engineering, University of Nigeria, Nsukka Nigeria

Satyanarayana Murthy Polisetty
Software Developer, StaffingTree Inc., USA.

Sandeep Kamadi
Wilmington University, USA.

Shiva Kumar Chinnam
Clemson University, USA.

Chandrasekhar Anuganti
Truist Bank, North Carolina, USA

Praveen Kumar Reddy Gujjala
NovelTek Systems, USA

Sarath Babu Gosipathala
OCTA and RCTC, Anaheim, CA

Jaya Ram Menda
Senior Lead Software Engineer, USA

Madhava Rao Thota
Database Administrator/ Architect, USA

Chandra Sekhar Oleti
JP Morgan Chase, USA.

Ashish Gupta
Senior IT advisor (Senior Architect) & Independent Researcher, India

Thirupurasundari Chandrasekaran
Sr Project Manager, Phoenix USA

Ramadevi Nunna
Senior Assistant Vice President & Senior Data Engineer

Ramesh Tangudu
Application Development Lead & Enterprise Architect, S&P Global, USA

Advisory Committee

Dr. Prabhat Chand Yadav

Assistant Professor, Department of Mechanical Engineering, Thapar Institute of Engineering & Technology, Punjab, India.

Dr. G. Sucharitha

Associate Professor, Department of Electronics & Communication Engineering, Institute of Aeronautical Engineering (IARE), Hyderabad, India.

Dr. J Sirisha Devi

Associate Professor, Department of Computer Science & Engineering, Institute of Aeronautical Engineering (IARE), Hyderabad, India

Dr K. Viswanath Allamraju

Professor, Department of Mechanical Engineering, Institution of Aeronautical Engineering, Telangana, India

Dr. Adinarayana Vannala

Professor, Department of Electronics & Communication Engg, Avanthi Institute of Engineering & Technology, Telangana, India.

Judges / Peer Reviewers

Srinivasa Rao Seetala

Senior Data Architect , USA.

Dr. Mohamed Reda Ali

Assistant Professor, Department of Engineering Mathematics & Physics, Benha University, Egypt.

Dr. Zeinab Abbas Zaazou

Associate Professor, Department of Faculty of Management Sciences, MSA University, Egypt.

Dr. Md. Khaja Mohiddin

Associate Professor, Bhilai Institute of Technology Raipur, India.

Dr. Seyed Alireza Mousavi Shirazi

Assistant professor (20th-grader) and full-time faculty member at “Islamic AZAD University, South Tehran Branch, Iran.

Usman Imtiaz

Research assistant, USA.

Dr. Sanjay Pande M.B.FIE

Professor and Principal GM Institute of Technology, Davangere.

Mr. Vasudevan Senathi Ramdoss

Senior Performance Engineer & Independent Researcher, USA.

Dr. Emmanuel Uniamikogbo

Associate Professor, Department of Accounting & Finance, Faculty of Management & Social Sciences, Margaret Lawrence University, Nigeria.

CONTENTS

S.No	Title/Author Name	Page No
1.	AI-Based Smart Street Lighting Systems Using IoT <i>Dr. Rakesh Menon, Priyadharshini K</i>	1
2.	Intelligent AI Chatbots for IoT Smart Devices <i>Arvind Kumar, Dr. Meena Ravi</i>	2
3.	AI-Driven Smart Farming Using Drone and IoT Technology <i>Dr. Naveen Raj, Divya Sharma</i>	3
4.	Real-Time Health Prediction Using Wearable IoT Sensors <i>Dr. Kavitha Reddy, Vishal Nair</i>	4
5.	AI-Powered Smart Waste Segregation Systems <i>Rahul Verma, Dr. Priya Mohan</i>	5
6.	Smart Building Automation Using Artificial Intelligence <i>Dr. Lakshmi Narayana, Akash Patel</i>	6
7.	AI-Based IoT Systems for Elderly Care Monitoring <i>Dr. Harini Krishnan, Janani S</i>	7
8.	Machine Learning for Smart Water Distribution Networks <i>Gokul Raj, Dr. Surya Prakash</i>	8
9.	AI-Driven Fire Detection and Alert Systems Using IoT <i>Dr. Ramesh Kumar, Bharath R</i>	9
10.	Intelligent Transportation Systems with AI and Sensor Networks <i>Dr. Vikram Sharma, Nandhini Ravi</i>	10
11.	Smart Energy Metering Using AI and IoT Platforms <i>Dinesh Kumar, Dr. Rekha Devi</i>	11
12.	AI-Based Smart Attendance Monitoring Systems <i>Ashwin Raj, Dr. Keerthana Iyer</i>	12
13.	Intelligent Cold Chain Monitoring Using IoT and AI <i>Dr. Suresh BabuMs. Priya Nair</i>	13
14.	AI-Enabled Smart Retail Inventory Management Systems <i>Manoj Krishna, Dr. Pooja Shah</i>	14
15.	Deep Learning for Smart Camera Surveillance Applications <i>Dr. Aravind Kumar, Karthik Raman</i>	15
16.	AI and IoT Integration for Smart Railway Monitoring <i>Dr. Rajesh Verma, Sneha Pillai</i>	16
17.	AI-Based Weather Forecasting Using IoT Sensor Data <i>Dr. Vinod Menon, Rithvik S</i>	17
18.	Intelligent Home Security Systems Using AIoT <i>Sanjay Kumar, Dr. Deepa Narayanan</i>	18
19.	AI-Powered Connected Vehicle Monitoring Systems <i>Dr. Hari Prasad, Vaishnavi Rao</i>	19
20.	Smart Industrial Safety Monitoring Using Artificial Intelligence <i>Daniel Joseph, Dr. Kavya Ramesh</i>	20
21.	AI-Based Smart Disaster Management Systems <i>Dr. Ashok Kumar, Monisha Devi</i>	21
22.	AI and IoT for Smart Hospital Infrastructure <i>Dr. Priyanka Das, Ajith Paul</i>	22
23.	Intelligent Power Consumption Monitoring Using AI <i>Nitin Sharma, Dr. Meera Krishnan</i>	23
24.	AI-Based Soil Health Monitoring Systems for Agriculture <i>Dr. Raghavendra Rao, Keerthi Raj</i>	24
25.	Smart Campus Management Using AI and IoT Technologies <i>Dr. K. Balaji, Arun Prakash</i>	25
26.	AI-Driven IoT Systems for Marine Environment Monitoring	26

	<i>Dr. S. Mahesh, Reshma N</i>	
27.	Intelligent Inventory Tracking Using RFID and AI <i>Tarun Mehta, Dr. Bhavana R</i>	27
28.	AI-Based Human Detection Systems Using Smart Sensors <i>Dr. Vivek Anand, Harini S</i>	28
29.	Smart Pollution Monitoring Using Artificial Intelligence and IoT <i>Dr. Shyam Prasad, Kiran Dev</i>	29
30.	<i>AI-Powered Automation Frameworks for Smart Factories</i> <i>Rohit Menon, Dr. Nisha Kapoor</i>	30

AI-Based Smart Street Lighting Systems Using IoT

Dr. Rakesh Menon¹, Priyadharshini K²

^{1,2} IoT Research Scholar, VIT University, India

Abstract: The increasing demand for energy-efficient urban infrastructure has accelerated the adoption of intelligent street lighting systems. Traditional lighting methods consume excessive electricity and require continuous manual monitoring, leading to higher operational costs and energy wastage. This research presents an AI-Based Smart Street Lighting System integrated with Internet of Things (IoT) technology to improve energy efficiency, automation, and smart city management. The proposed system utilizes IoT sensors, wireless communication modules, and artificial intelligence algorithms to monitor environmental conditions, vehicle movement, and pedestrian activity in real time. Based on the collected sensor data, the AI model dynamically controls street light brightness and switching operations to minimize power consumption while maintaining public safety. The system also supports remote monitoring, fault detection, and predictive maintenance through cloud-based analytics platforms. Experimental analysis demonstrates that the proposed approach significantly reduces energy usage, maintenance costs, and human intervention compared to conventional street lighting systems. The study highlights the importance of integrating AI and IoT technologies for developing sustainable and intelligent urban infrastructure.

Keywords: Artificial Intelligence, Internet of Things (IoT), Smart Street Lighting, Energy Efficiency, Smart Cities, Intelligent Automation, Wireless Sensors, Predictive Maintenance, Sustainable Infrastructure, AIoT

Intelligent AI Chatbots for IoT Smart Devices

Arvind Kumar¹, Dr. Meena Ravi²

¹AI Engineer, Infosys Ltd, India

²Professor, Anna University, India

Abstract: The rapid advancement of Internet of Things (IoT) technologies has increased the need for intelligent and interactive communication systems for smart devices. Traditional user interfaces often face limitations in handling real-time device interaction and personalized assistance. This paper presents an Intelligent AI Chatbot framework designed for IoT-enabled smart devices to improve user communication, automation, and operational efficiency. The proposed system integrates artificial intelligence, natural language processing (NLP), and cloud-based IoT platforms to enable real-time interaction between users and connected devices. The chatbot can understand user commands, monitor device status, provide automated responses, and perform intelligent decision-making based on contextual data. The framework supports voice and text-based communication, remote device management, and adaptive learning for enhanced user experience. Experimental evaluation demonstrates improved response accuracy, reduced human intervention, and efficient smart device control compared to traditional IoT interaction systems. The research highlights the potential of AI-powered chatbots in enhancing intelligent automation and user engagement within modern IoT ecosystems.

Keywords: Artificial Intelligence, IoT, AI Chatbots, Smart Devices, Natural Language Processing, Intelligent Automation, Cloud Computing, Human-Computer Interaction, Smart Systems, Conversational AI

AI-Driven Smart Farming Using Drone and IoT Technology

Dr. Naveen Raj¹, Divya Sharma²

¹Agricultural AI Scientist, TNAU, India

²IoT Developer, AgriTech Solutions Pvt Ltd, India

Abstract: The integration of Artificial Intelligence (AI), Internet of Things (IoT), and drone technologies has transformed modern agricultural practices by enabling precision farming and intelligent crop management. Traditional farming methods often face challenges related to water management, crop monitoring, pest control, and labor-intensive operations. This paper proposes an AI-Driven Smart Farming System that utilizes drones and IoT technologies for real-time agricultural monitoring and automated decision-making. The proposed framework incorporates IoT sensors to collect environmental data such as soil moisture, temperature, humidity, and nutrient levels, while drones capture aerial images for crop health analysis and field surveillance. Artificial intelligence and machine learning algorithms analyze the collected data to optimize irrigation, detect diseases, monitor crop growth, and improve overall agricultural productivity. The system also supports remote monitoring through cloud-based platforms and mobile applications for efficient farm management. Experimental results demonstrate improved crop yield, reduced resource wastage, and enhanced operational efficiency compared to conventional farming techniques. The study highlights the importance of AI and IoT integration in developing sustainable and intelligent agricultural ecosystems.

Keywords: Artificial Intelligence, Smart Farming, Internet of Things (IoT), Drones, Precision Agriculture, Machine Learning, Crop Monitoring, Automated Irrigation, Agricultural Technology, Sustainable Farming

Real-Time Health Prediction Using Wearable IoT Sensors

Dr. Kavitha Reddy¹, Vishal Nair²

¹Healthcare Data Scientist, Apollo Hospitals, India

²Embedded Systems Engineer, Philips Healthcare, India

Abstract: The growing adoption of wearable healthcare devices and Internet of Things (IoT) technologies has significantly improved real-time patient monitoring and predictive healthcare systems. Traditional health monitoring approaches often fail to provide continuous observation and early detection of medical conditions. This paper presents a Real-Time Health Prediction System using wearable IoT sensors integrated with artificial intelligence techniques for continuous health monitoring and predictive analysis. The proposed framework utilizes wearable sensors to collect physiological parameters such as heart rate, body temperature, blood oxygen levels, blood pressure, and physical activity in real time. The collected data is transmitted through IoT networks to cloud-based platforms, where machine learning algorithms analyze the information to identify health abnormalities and predict potential medical risks. The system supports remote healthcare monitoring, emergency alerts, and personalized health recommendations for improved patient care. Experimental evaluation demonstrates enhanced prediction accuracy, faster response time, and reduced healthcare monitoring costs compared to traditional healthcare systems. The study emphasizes the role of AI and IoT technologies in developing intelligent, reliable, and efficient healthcare monitoring solutions for modern medical applications.

Keywords: Artificial Intelligence, Internet of Things (IoT), Wearable Sensors, Healthcare Monitoring, Real-Time Health Prediction, Machine Learning, Smart Healthcare, Remote Patient Monitoring, Predictive Analytics, Biomedical Systems

AI-Powered Smart Waste Segregation Systems

Rahul Verma¹, Dr. Priya Mohan²

¹Software Engineer, Wipro Technologies, India

²Smart City Researcher, IIT Madras, India

Abstract: Rapid urbanization and increasing waste generation have created significant challenges in waste management and environmental sustainability. Traditional waste segregation methods are often inefficient, labor-intensive, and prone to human error, resulting in poor recycling efficiency and environmental pollution. This paper presents an AI-Powered Smart Waste Segregation System that utilizes artificial intelligence and Internet of Things (IoT) technologies for automated waste classification and monitoring. The proposed system employs smart sensors, cameras, and machine learning algorithms to identify and separate different categories of waste such as plastic, metal, paper, glass, and organic materials in real time. IoT connectivity enables remote monitoring, data collection, and system management through cloud-based platforms. The intelligent framework improves segregation accuracy, reduces manual intervention, and supports efficient recycling processes. Experimental analysis demonstrates that the proposed system enhances operational efficiency, minimizes waste handling costs, and contributes to sustainable smart city infrastructure. The study highlights the potential of AI and IoT integration in creating intelligent and eco-friendly waste management solutions for modern urban environments.

Keywords: Artificial Intelligence, Smart Waste Management, Internet of Things (IoT), Waste Segregation, Machine Learning, Smart Cities, Recycling Systems, Automation, Environmental Sustainability, Intelligent Monitoring

Smart Building Automation Using Artificial Intelligence

Dr. Lakshmi Narayanan¹, Akash Patel²

¹Professor, SASTRA University, India

²Automation Engineer, Siemens India

Abstract: The rapid development of smart infrastructure technologies has increased the demand for intelligent building automation systems capable of improving energy efficiency, security, and operational management. Conventional building management systems often lack adaptive control and real-time decision-making capabilities, leading to increased energy consumption and maintenance costs. This paper presents a Smart Building Automation System using Artificial Intelligence (AI) and Internet of Things (IoT) technologies to enhance building performance and occupant comfort. The proposed system integrates smart sensors, AI algorithms, and wireless communication networks to monitor and control lighting, heating, ventilation, air conditioning (HVAC), security systems, and energy usage in real time. Machine learning techniques are applied to analyze occupancy patterns and environmental conditions for automated decision-making and predictive maintenance. The framework also enables remote monitoring and centralized management through cloud-based platforms. Experimental evaluation demonstrates improved energy optimization, reduced operational expenses, enhanced security, and efficient resource management compared to traditional building automation systems. The study highlights the significance of AI-driven automation in developing sustainable and intelligent smart building environments.

Keywords: Artificial Intelligence, Smart Building, Building Automation, Internet of Things (IoT), Energy Management, Machine Learning, Smart Infrastructure, HVAC Automation, Predictive Maintenance, Intelligent Control Systems

AI-Based IoT Systems for Elderly Care Monitoring

Dr. Harini Krishnan¹, Janani S²

¹Biomedical Researcher, AIIMS Delhi, India

²Research Associate, PSG College of Technology, India

Abstract: The increasing elderly population and the growing demand for continuous healthcare support have accelerated the need for intelligent elderly care monitoring systems. Traditional caregiving approaches often face challenges in providing real-time health tracking, emergency response, and remote patient supervision. This paper presents an AI-Based IoT System for Elderly Care Monitoring that integrates artificial intelligence, wearable sensors, and Internet of Things (IoT) technologies to improve healthcare assistance and safety for senior citizens. The proposed framework continuously monitors vital health parameters such as heart rate, body temperature, blood pressure, movement patterns, and fall detection using smart wearable devices and environmental sensors. The collected data is analyzed using machine learning algorithms to identify abnormal conditions and generate real-time alerts for caregivers and healthcare professionals. The system supports remote monitoring, emergency notifications, and predictive healthcare analysis through cloud-based platforms and mobile applications. Experimental results demonstrate improved healthcare monitoring accuracy, reduced emergency response time, and enhanced patient safety compared to conventional elderly care systems. The research highlights the importance of AI and IoT technologies in developing intelligent, reliable, and patient-centered elderly healthcare solutions.

Keywords: Artificial Intelligence, Internet of Things (IoT), Elderly Care Monitoring, Wearable Sensors, Smart Healthcare, Machine Learning, Fall Detection, Remote Patient Monitoring, Predictive Healthcare, Intelligent Healthcare Systems

Machine Learning for Smart Water Distribution Networks

Gokul Raj¹, Dr. Surya Prakash²

¹Data Analyst, L&T Smart World, India

²Environmental Scientist, IIT Bombay, India

Abstract: Efficient water distribution management has become a major challenge due to increasing urbanization, water scarcity, and aging infrastructure systems. Traditional water distribution networks often face issues such as water leakage, pressure imbalance, inefficient resource allocation, and delayed fault detection. This paper presents a Machine Learning-Based Smart Water Distribution Network that integrates artificial intelligence, IoT sensors, and data analytics to improve water management and operational efficiency. The proposed system utilizes smart sensors to monitor water flow, pressure levels, water quality, and consumption patterns in real time across the distribution network. Machine learning algorithms analyze the collected data to detect anomalies, predict water demand, identify leakages, and optimize water supply operations. The framework also enables remote monitoring and intelligent decision-making through cloud-based platforms. Experimental evaluation demonstrates improved water conservation, reduced operational costs, enhanced fault detection accuracy, and efficient resource utilization compared to conventional water management systems. The study emphasizes the role of AI and IoT technologies in building sustainable and intelligent smart water infrastructure for future urban environments.

Keywords: Machine Learning, Smart Water Distribution, Internet of Things (IoT), Water Management, Smart Infrastructure, Predictive Analytics, Leakage Detection, Intelligent Monitoring, Sustainable Water Systems, Data Analytics

AI-Driven Fire Detection and Alert Systems Using IoT

Dr. Ramesh Kumar¹, Bharath R²

¹Safety Systems Researcher, NIT Trichy, India

²IoT Engineer, Bosch India

Abstract: Fire accidents in residential, industrial, and commercial environments can cause severe damage to life and property if not detected at an early stage. Conventional fire detection systems often rely on basic smoke sensors and manual monitoring, which may result in delayed response and limited accuracy. This paper presents an AI-Driven Fire Detection and Alert System using Internet of Things (IoT) technology to improve early fire detection, emergency response, and safety management. The proposed system integrates smart sensors, temperature detectors, smoke sensors, gas sensors, and artificial intelligence algorithms for real-time environmental monitoring and intelligent fire prediction. IoT connectivity enables continuous data transmission to cloud-based platforms for remote monitoring and automated alert generation. Machine learning techniques are used to analyze sensor data patterns and reduce false alarms by accurately identifying fire-related incidents. The system also supports emergency notifications through mobile applications and automated response mechanisms for rapid action. Experimental analysis demonstrates enhanced detection accuracy, faster response time, and improved safety management compared to traditional fire alarm systems. The study highlights the importance of AI and IoT integration in developing reliable and intelligent fire safety solutions for smart environments.

Keywords: Artificial Intelligence, Internet of Things (IoT), Fire Detection System, Smart Sensors, Emergency Alert Systems, Machine Learning, Safety Monitoring, Intelligent Surveillance, Smart Safety Infrastructure, Real-Time Monitoring

Intelligent Transportation Systems with AI and Sensor Networks

Dr. Vikram Sharma¹, Nandhini Ravi²

¹Transportation Research Scientist, IIT Delhi, India

²Data Engineer, TCS Research Labs, India

Abstract: The rapid growth of urban populations and vehicle usage has created significant challenges in traffic management, road safety, and transportation efficiency. Traditional transportation systems often struggle with traffic congestion, delayed incident response, and inefficient resource utilization. This paper presents an Intelligent Transportation System (ITS) that integrates Artificial Intelligence (AI), sensor networks, and Internet of Things (IoT) technologies to improve traffic monitoring and smart mobility management. The proposed framework utilizes smart sensors, cameras, GPS modules, and wireless communication networks to collect real-time traffic and vehicle data. AI and machine learning algorithms analyze the collected information to predict traffic conditions, optimize signal control, detect accidents, and support intelligent route planning. The system also enables real-time communication between vehicles and transportation infrastructure for enhanced road safety and operational efficiency. Experimental evaluation demonstrates improved traffic flow management, reduced travel time, enhanced accident detection, and efficient transportation monitoring compared to conventional traffic systems. The study highlights the importance of AI-powered intelligent transportation solutions in developing sustainable and smart urban mobility infrastructure.

Keywords: Artificial Intelligence, Intelligent Transportation Systems, Internet of Things (IoT), Sensor Networks, Smart Mobility, Traffic Management, Machine Learning, Smart Cities, Real-Time Monitoring, Intelligent Traffic Control

Smart Energy Metering Using AI and IoT Platforms

Dinesh Kumar¹, Dr. Rekha Devi²

¹Electrical Engineer, Schneider Electric, India

²Professor, Anna University, India

Abstract: The increasing demand for efficient energy management and sustainable power utilization has accelerated the adoption of smart energy monitoring technologies. Traditional electricity metering systems often lack real-time monitoring, automated analysis, and accurate energy consumption management capabilities. This paper presents a Smart Energy Metering System using Artificial Intelligence (AI) and Internet of Things (IoT) platforms to improve energy monitoring, consumption analysis, and operational efficiency. The proposed framework integrates smart meters, IoT communication modules, and machine learning algorithms to collect and analyze real-time electricity usage data from residential, commercial, and industrial environments. AI techniques are utilized to predict energy consumption patterns, detect anomalies, identify power wastage, and optimize energy utilization. The system also supports remote monitoring, automated billing, and predictive maintenance through cloud-based platforms and mobile applications. Experimental analysis demonstrates improved energy efficiency, reduced operational costs, enhanced monitoring accuracy, and better resource management compared to conventional metering systems. The study highlights the significance of AI and IoT integration in building intelligent and sustainable smart energy infrastructure for future smart grid applications.

Keywords: Artificial Intelligence, Smart Energy Metering, Internet of Things (IoT), Energy Management, Smart Grid, Machine Learning, Predictive Analytics, Intelligent Monitoring, Power Consumption Analysis, Sustainable Energy Systems

AI-Based Smart Attendance Monitoring Systems

Ashwin Raj¹, Dr. Keerthana Iyer²

¹Software Developer, Zoho Corporation, India

²AI Research Professor, VIT University, India

Abstract: Attendance management plays a crucial role in educational institutions and organizational environments for maintaining accurate records and operational efficiency. Traditional attendance systems based on manual entry or biometric devices often face issues related to time consumption, data inaccuracies, and security limitations. This paper presents an AI-Based Smart Attendance Monitoring System that integrates artificial intelligence, facial recognition technology, and Internet of Things (IoT) platforms to automate attendance tracking and monitoring processes. The proposed system utilizes smart cameras, image processing techniques, and machine learning algorithms to identify individuals in real time and automatically record attendance data with high accuracy. IoT connectivity enables centralized data storage, remote access, and real-time reporting through cloud-based platforms. The framework also supports automated notifications, data analytics, and attendance management dashboards for administrators and educators. Experimental evaluation demonstrates improved attendance accuracy, reduced manual effort, enhanced security, and efficient record management compared to conventional attendance systems. The study highlights the role of AI and IoT technologies in developing intelligent, reliable, and scalable attendance monitoring solutions for modern institutions and workplaces.

Keywords: Artificial Intelligence, Smart Attendance System, Facial Recognition, Internet of Things (IoT), Machine Learning, Automated Monitoring, Image Processing, Smart Education, Real-Time Tracking, Intelligent Management Systems

Intelligent Cold Chain Monitoring Using IoT and AI

Dr. Suresh Babu¹, Priya Nair²

¹Logistics Technology Researcher, IIT Kharagpur, India

²Supply Chain Analyst, DHL India

Abstract: Maintaining product quality and safety during transportation and storage is a critical challenge in cold chain logistics, particularly for food, pharmaceutical, and healthcare industries. Traditional cold chain monitoring systems often lack real-time tracking, predictive analysis, and intelligent decision-making capabilities, leading to product spoilage and operational inefficiencies. This paper presents an Intelligent Cold Chain Monitoring System using Internet of Things (IoT) and Artificial Intelligence (AI) technologies to enhance temperature-controlled logistics management. The proposed framework integrates smart sensors, wireless communication networks, and cloud-based platforms to continuously monitor environmental parameters such as temperature, humidity, and storage conditions in real time. AI and machine learning algorithms analyze the collected data to predict equipment failures, detect anomalies, optimize storage conditions, and generate automated alerts for preventive actions. The system also enables remote monitoring and centralized management through mobile and web applications. Experimental evaluation demonstrates improved product safety, reduced spoilage rates, enhanced monitoring accuracy, and efficient supply chain operations compared to traditional cold chain systems. The study highlights the importance of AI and IoT integration in developing reliable and intelligent cold chain logistics infrastructure.

Keywords: Artificial Intelligence, Internet of Things (IoT), Cold Chain Monitoring, Smart Logistics, Temperature Monitoring, Machine Learning, Predictive Maintenance, Supply Chain Management, Intelligent Monitoring Systems, Real-Time Tracking

AI-Enabled Smart Retail Inventory Management Systems

Mr. Manoj Krishna¹, Dr. Pooja Shah²

¹Retail Analytics Engineer, Reliance Retail, India

²Professor, Christ University, India

Abstract: Efficient inventory management is essential for the retail industry to ensure product availability, reduce operational costs, and improve customer satisfaction. Traditional inventory management systems often face challenges such as inaccurate stock tracking, delayed replenishment, and inefficient demand forecasting. This paper presents an AI-Enabled Smart Retail Inventory Management System that integrates Artificial Intelligence (AI), Internet of Things (IoT), and data analytics technologies for intelligent inventory monitoring and automated decision-making. The proposed framework utilizes smart sensors, RFID technology, and cloud-based platforms to track inventory movement and stock levels in real time. Machine learning algorithms analyze sales patterns, customer demand, and inventory data to predict stock requirements, optimize supply chain operations, and minimize product shortages or overstock conditions. The system also supports automated alerts, real-time reporting, and centralized management for improved operational efficiency. Experimental evaluation demonstrates enhanced inventory accuracy, reduced operational expenses, improved demand forecasting, and efficient retail management compared to conventional inventory systems. The study highlights the significance of AI and IoT technologies in developing intelligent and data-driven retail infrastructure for modern business environments.

Keywords: Artificial Intelligence, Smart Retail, Inventory Management, Internet of Things (IoT), RFID Technology, Machine Learning, Demand Forecasting, Retail Analytics, Supply Chain Optimization, Intelligent Monitoring Systems

Deep Learning for Smart Camera Surveillance Applications

Dr. Aravind Kumar¹, Karthik Raman²

¹Computer Vision Scientist, IIIT Hyderabad, India

²AI Developer, Cognizant Technology Solutions, India

Abstract: The increasing demand for advanced security and surveillance systems has accelerated the adoption of intelligent video monitoring technologies. Traditional surveillance systems primarily depend on manual observation, which often results in delayed threat detection and limited monitoring efficiency. This paper presents a Deep Learning-Based Smart Camera Surveillance System that integrates artificial intelligence, computer vision, and Internet of Things (IoT) technologies for real-time monitoring and intelligent security analysis. The proposed framework utilizes smart cameras, image processing techniques, and deep learning algorithms to detect suspicious activities, identify objects, recognize faces, and monitor human behavior automatically. IoT connectivity enables continuous data transmission, remote surveillance, and centralized monitoring through cloud-based platforms. The system also supports automated alert generation and predictive analysis for enhanced public safety and security management. Experimental evaluation demonstrates improved surveillance accuracy, faster threat detection, reduced human intervention, and efficient monitoring performance compared to traditional surveillance methods. The study highlights the importance of deep learning and AI-driven surveillance technologies in developing intelligent and secure monitoring infrastructures for smart cities and industrial environments.

Keywords: Deep Learning, Smart Surveillance, Artificial Intelligence, Computer Vision, Internet of Things (IoT), Facial Recognition, Intelligent Monitoring, Image Processing, Security Systems, Real-Time Video Analytics

AI and IoT Integration for Smart Railway Monitoring

Dr. Rajesh Verma¹, Ms. Sneha Pillai²

¹Railway Systems Researcher, IIT Kanpur, India

²IoT Engineer, Indian Railways Research Division, India

Abstract: The modernization of railway infrastructure requires intelligent monitoring systems capable of improving operational safety, maintenance efficiency, and real-time decision-making. Traditional railway monitoring methods often face challenges related to delayed fault detection, manual inspection, and limited predictive analysis. This paper presents an AI and IoT-Based Smart Railway Monitoring System designed to enhance railway safety and operational performance through intelligent automation and real-time data analytics. The proposed framework integrates IoT sensors, wireless communication networks, and artificial intelligence algorithms to continuously monitor railway tracks, train movement, vibration levels, environmental conditions, and equipment performance. Machine learning techniques are utilized to identify abnormalities, predict maintenance requirements, and detect potential failures before critical incidents occur. The system also enables remote monitoring and centralized management through cloud-based platforms and smart dashboards. Experimental evaluation demonstrates improved fault detection accuracy, reduced maintenance costs, enhanced operational reliability, and better railway safety management compared to conventional monitoring systems. The study highlights the importance of AI and IoT integration in developing intelligent and sustainable railway infrastructure for future smart transportation systems.

Keywords: Artificial Intelligence, Internet of Things (IoT), Smart Railway Monitoring, Predictive Maintenance, Intelligent Transportation Systems, Machine Learning, Railway Safety, Real-Time Monitoring, Smart Infrastructure, Automated Fault Detection

AI-Based Weather Forecasting Using IoT Sensor Data

Dr. Vinod Menon¹, Rithvik S²

¹Climate Data Scientist, IISc Bangalore, India

²Machine Learning Engineer, IBM India

Abstract: Accurate weather forecasting plays a vital role in agriculture, disaster management, transportation, and environmental monitoring. Traditional forecasting systems often face limitations in processing real-time localized environmental data and delivering highly accurate predictions. This paper presents an AI-Based Weather Forecasting System that utilizes Internet of Things (IoT) sensor data and machine learning techniques for intelligent climate prediction and environmental analysis. The proposed framework integrates smart IoT sensors to collect real-time atmospheric parameters such as temperature, humidity, rainfall, wind speed, and air pressure from distributed monitoring stations. Artificial intelligence and deep learning algorithms analyze the collected data to identify weather patterns, predict climatic changes, and improve forecasting accuracy. The system supports cloud-based data storage, remote monitoring, and automated alert generation for extreme weather conditions. Experimental evaluation demonstrates enhanced prediction performance, faster data processing, and improved forecasting reliability compared to conventional weather monitoring systems. The study highlights the significance of AI and IoT integration in developing intelligent and data-driven weather forecasting infrastructure for smart environmental management applications.

Keywords: Artificial Intelligence, Weather Forecasting, Internet of Things (IoT), Machine Learning, Climate Monitoring, Environmental Analytics, Smart Sensors, Predictive Modeling, Real-Time Data Analysis, Intelligent Forecasting Systems

Intelligent Home Security Systems Using AIoT

Sanjay Kumar¹, Dr. Deepa Narayanan²

¹Cybersecurity Engineer, Accenture India

²Professor, SRM University, India

Abstract: The increasing need for residential safety and smart home automation has accelerated the development of intelligent home security solutions. Traditional security systems often rely on manual monitoring and basic alarm mechanisms, which may result in delayed threat detection and limited system adaptability. This paper presents an Intelligent Home Security System using Artificial Intelligence of Things (AIoT) technology to improve real-time surveillance, threat detection, and automated security management. The proposed framework integrates smart sensors, surveillance cameras, motion detectors, and artificial intelligence algorithms for continuous monitoring of residential environments. Machine learning and computer vision techniques are utilized to identify suspicious activities, recognize authorized individuals, and generate automated alerts during security breaches. IoT connectivity enables remote access, cloud-based monitoring, and real-time notification through mobile applications. The system also supports intelligent automation features such as smart locking, emergency response, and predictive security analysis. Experimental evaluation demonstrates improved security accuracy, reduced false alarms, enhanced remote monitoring, and efficient threat management compared to traditional home security systems. The study highlights the significance of AIoT technologies in developing intelligent, reliable, and scalable smart home security infrastructure.

Keywords: Artificial Intelligence of Things (AIoT), Smart Home Security, Internet of Things (IoT), Machine Learning, Computer Vision, Intelligent Surveillance, Smart Sensors, Threat Detection, Automated Monitoring, Cybersecurity Systems

AI-Powered Connected Vehicle Monitoring Systems

Dr. Hari Prasad¹, Vaishnavi Rao²

¹Automotive AI Researcher, Mahindra Research Valley, India

²Embedded Engineer, Tata Elxsi, India

Abstract: The advancement of intelligent transportation technologies and connected vehicle ecosystems has increased the demand for real-time vehicle monitoring and predictive analytics systems. Traditional vehicle monitoring methods often lack intelligent decision-making capabilities, continuous connectivity, and automated fault analysis. This paper presents an AI-Powered Connected Vehicle Monitoring System that integrates Artificial Intelligence (AI), Internet of Things (IoT), and wireless communication technologies to improve vehicle safety, performance, and operational efficiency. The proposed framework utilizes onboard sensors, GPS modules, and cloud-based platforms to continuously collect and analyze vehicle data such as engine performance, fuel consumption, driving behavior, location tracking, and system diagnostics. Machine learning algorithms process the collected data to predict maintenance requirements, detect anomalies, and support intelligent driving assistance. The system also enables real-time communication between vehicles and monitoring platforms for enhanced traffic management and road safety. Experimental evaluation demonstrates improved vehicle monitoring accuracy, reduced maintenance costs, enhanced driver safety, and efficient fleet management compared to traditional monitoring systems. The study highlights the importance of AI and IoT integration in developing intelligent connected vehicle infrastructure for future smart transportation ecosystems.

Keywords: Artificial Intelligence, Connected Vehicles, Internet of Things (IoT), Vehicle Monitoring, Machine Learning, Predictive Maintenance, Smart Transportation, Intelligent Mobility, Real-Time Tracking, Automotive Analytics

Smart Industrial Safety Monitoring Using Artificial Intelligence

Daniel Joseph¹, Dr. Kavya Ramesh²

¹Industrial Automation Engineer, ABB India

²Safety Researcher, IIT Roorkee, India

Abstract: Industrial environments involve complex operations and hazardous conditions that require continuous monitoring to ensure worker safety and operational reliability. Traditional industrial safety systems often depend on manual supervision and reactive safety measures, which may lead to delayed incident detection and increased workplace risks. This paper presents a Smart Industrial Safety Monitoring System using Artificial Intelligence (AI) and Internet of Things (IoT) technologies to enhance workplace safety, risk assessment, and emergency response management. The proposed framework integrates smart sensors, wearable devices, surveillance systems, and machine learning algorithms to monitor environmental conditions, worker activities, equipment performance, gas leakage, temperature variations, and hazardous events in real time. AI-based analytics are utilized to detect abnormalities, predict potential safety risks, and generate automated alerts for preventive action. IoT connectivity enables centralized monitoring, remote management, and cloud-based data analysis for efficient industrial safety operations. Experimental evaluation demonstrates improved incident detection accuracy, reduced workplace hazards, enhanced operational efficiency, and faster emergency response compared to conventional safety monitoring systems. The study highlights the significance of AI-driven intelligent monitoring solutions in developing safe, reliable, and smart industrial environments.

Keywords: Artificial Intelligence, Industrial Safety Monitoring, Internet of Things (IoT), Smart Sensors, Machine Learning, Workplace Safety, Predictive Analytics, Hazard Detection, Intelligent Monitoring Systems, Industrial Automation

AI-Based Smart Disaster Management Systems

Dr. Ashok Kumar¹, Monisha Devi²

¹Disaster Analytics Scientist, NIDM India

²GIS Research Scholar, Anna University, India

Abstract: Natural and human-made disasters pose significant threats to human life, infrastructure, and environmental sustainability. Traditional disaster management systems often face limitations in early warning, real-time monitoring, and rapid emergency response coordination. This paper presents an AI-Based Smart Disaster Management System that integrates Artificial Intelligence (AI), Internet of Things (IoT), Geographic Information Systems (GIS), and data analytics technologies for intelligent disaster prediction and response management. The proposed framework utilizes IoT sensors, satellite data, environmental monitoring systems, and communication networks to collect real-time disaster-related information such as weather conditions, seismic activity, flood levels, and environmental changes. Machine learning algorithms analyze the collected data to predict potential disasters, identify high-risk zones, and support emergency decision-making processes. The system also enables automated alert generation, remote monitoring, and coordinated emergency response through cloud-based platforms and mobile applications. Experimental evaluation demonstrates improved disaster prediction accuracy, reduced response time, enhanced resource management, and better risk mitigation compared to traditional disaster management systems. The study highlights the importance of AI and IoT technologies in developing intelligent and resilient disaster management infrastructure for smart and sustainable communities.

Keywords: Artificial Intelligence, Disaster Management, Internet of Things (IoT), Geographic Information Systems (GIS), Machine Learning, Emergency Response, Predictive Analytics, Smart Monitoring, Environmental Sensing, Intelligent Warning Systems

AI and IoT for Smart Hospital Infrastructure

Dr. Priyanka Das¹, Ajith Paul²

¹Medical Informatics Researcher, AIIMS Delhi, India

²IoT Systems Architect, MedTech Labs, India

Abstract: The rapid advancement of healthcare technologies has increased the demand for intelligent hospital infrastructure capable of improving patient care, operational efficiency, and healthcare resource management. Traditional hospital systems often face challenges related to manual monitoring, delayed data processing, and inefficient equipment utilization. This paper presents a Smart Hospital Infrastructure framework that integrates Artificial Intelligence (AI), Internet of Things (IoT), and cloud computing technologies to enhance healthcare services and intelligent medical management. The proposed system utilizes smart sensors, connected medical devices, wearable technologies, and AI-based analytics to monitor patient health conditions, hospital equipment, environmental parameters, and healthcare operations in real time. Machine learning algorithms analyze the collected data to support predictive healthcare, automated diagnostics, resource optimization, and emergency response management. The framework also enables remote monitoring, centralized data management, and intelligent decision-making through cloud-based platforms and mobile applications. Experimental evaluation demonstrates improved healthcare efficiency, reduced operational costs, enhanced patient safety, and better medical resource utilization compared to conventional hospital systems. The study highlights the significance of AI and IoT integration in developing intelligent, connected, and patient-centered smart healthcare infrastructure.

Keywords: Artificial Intelligence, Internet of Things (IoT), Smart Hospital, Healthcare Infrastructure, Machine Learning, Remote Patient Monitoring, Medical Informatics, Intelligent Healthcare Systems, Smart Medical Devices, Predictive Healthcare

Intelligent Power Consumption Monitoring Using AI

Nitin Sharma¹, Dr. Meera Krishnan²

¹Energy Systems Engineer, Siemens Energy India

²Professor, Vellore Institute of Technology, India

Abstract: The increasing global demand for electricity and the need for sustainable energy management have created significant challenges in monitoring and optimizing power consumption. Traditional energy monitoring systems often lack real-time analytics, predictive capabilities, and intelligent automation for efficient energy utilization. This paper presents an Intelligent Power Consumption Monitoring System using Artificial Intelligence (AI) and Internet of Things (IoT) technologies to improve energy efficiency and smart power management. The proposed framework integrates smart meters, IoT sensors, and cloud-based communication platforms to continuously collect and analyze electricity consumption data from residential, commercial, and industrial environments. Machine learning algorithms are utilized to identify usage patterns, predict future energy demand, detect abnormal power consumption, and optimize energy utilization strategies. The system also supports automated alerts, remote monitoring, and intelligent decision-making for efficient resource management. Experimental evaluation demonstrates improved monitoring accuracy, reduced energy wastage, enhanced operational efficiency, and better demand forecasting compared to conventional energy monitoring systems. The study highlights the significance of AI-powered intelligent monitoring solutions in developing sustainable and energy-efficient smart infrastructure.

Keywords: Artificial Intelligence, Power Consumption Monitoring, Internet of Things (IoT), Energy Management, Smart Metering, Machine Learning, Predictive Analytics, Intelligent Monitoring Systems, Sustainable Energy, Smart Infrastructure

AI-Based Soil Health Monitoring Systems for Agriculture

Dr. Raghavendra Rao¹, Keerthi Raj²

¹Agricultural Scientist, ICAR, India

²IoT Research Scholar, Bharathiar University, India

Abstract: Soil health plays a critical role in agricultural productivity, crop quality, and sustainable farming practices. Traditional soil monitoring methods often involve manual testing processes that are time-consuming, expensive, and unable to provide real-time insights. This paper presents an AI-Based Soil Health Monitoring System that integrates Artificial Intelligence (AI), Internet of Things (IoT), and sensor technologies to improve soil analysis and precision agriculture management. The proposed framework utilizes smart sensors to continuously monitor soil parameters such as moisture content, pH level, temperature, nutrient concentration, and salinity in real time. Machine learning algorithms analyze the collected data to evaluate soil health conditions, predict crop suitability, and recommend optimal irrigation and fertilization strategies. IoT connectivity enables remote monitoring, cloud-based data storage, and automated alerts for efficient farm management. Experimental evaluation demonstrates improved soil analysis accuracy, optimized resource utilization, enhanced crop productivity, and reduced agricultural costs compared to conventional soil monitoring systems. The study highlights the importance of AI and IoT technologies in developing intelligent and sustainable agricultural solutions for modern farming environments.

Keywords: Artificial Intelligence, Soil Health Monitoring, Internet of Things (IoT), Precision Agriculture, Smart Sensors, Machine Learning, Crop Management, Sustainable Farming, Automated Irrigation, Agricultural Analytics

Smart Campus Management Using AI and IoT Technologies

Dr. K. Balaji¹, Arun Prakash²

¹Smart Systems Professor, Sathyabama Institute of Science and Technology, India

²Software Engineer, HCL Technologies, India

Abstract: The growing adoption of digital technologies in educational institutions has increased the demand for intelligent campus management systems capable of improving operational efficiency, security, and resource utilization. Traditional campus management methods often face challenges related to manual administration, inefficient monitoring, and limited real-time decision-making capabilities. This paper presents a Smart Campus Management System that integrates Artificial Intelligence (AI), Internet of Things (IoT), and cloud computing technologies for intelligent campus automation and infrastructure management. The proposed framework utilizes smart sensors, connected devices, surveillance systems, and machine learning algorithms to monitor and manage various campus operations such as attendance tracking, energy management, classroom automation, security surveillance, and environmental monitoring. IoT connectivity enables real-time data collection, remote access, and centralized control through cloud-based platforms and mobile applications. AI-based analytics support predictive maintenance, intelligent resource allocation, and automated decision-making for efficient campus operations. Experimental evaluation demonstrates improved administrative efficiency, enhanced campus security, optimized energy usage, and better resource management compared to conventional campus systems. The study highlights the significance of AI and IoT integration in developing intelligent, connected, and sustainable smart educational infrastructure.

Keywords: Artificial Intelligence, Smart Campus, Internet of Things (IoT), Campus Automation, Machine Learning, Smart Education, Intelligent Monitoring, Cloud Computing, Predictive Maintenance, Smart Infrastructure

AI-Driven IoT Systems for Marine Environment Monitoring

Dr. S. Mahesh¹, Reshma N²

¹Ocean Technology Researcher, NIOT Chennai, India

²Environmental Data Analyst, Oceanic Research Labs, India

Abstract: Marine ecosystems are highly sensitive to environmental changes, pollution, and climate variations, creating the need for advanced monitoring and management systems. Traditional marine monitoring methods often involve manual data collection processes that are time-consuming, expensive, and limited in real-time analysis capabilities. This paper presents an AI-Driven IoT System for Marine Environment Monitoring that integrates Artificial Intelligence (AI), Internet of Things (IoT), and sensor technologies for intelligent ocean observation and environmental analysis. The proposed framework utilizes underwater sensors, smart buoys, wireless communication networks, and cloud-based platforms to continuously monitor marine parameters such as water temperature, salinity, pH levels, dissolved oxygen, pollution levels, and ocean currents in real time. Machine learning algorithms analyze the collected data to identify environmental changes, predict ecological risks, and support sustainable marine resource management. The system also enables remote monitoring, automated alerts, and centralized data management for efficient environmental monitoring operations. Experimental evaluation demonstrates improved monitoring accuracy, faster environmental analysis, enhanced pollution detection, and efficient marine ecosystem management compared to conventional monitoring systems. The study highlights the significance of AI and IoT technologies in developing intelligent and sustainable marine environmental monitoring infrastructure.

Keywords: Artificial Intelligence, Marine Environment Monitoring, Internet of Things (IoT), Smart Sensors, Machine Learning, Ocean Analytics, Environmental Monitoring, Pollution Detection, Smart Marine Systems, Sustainable Ecosystems

Intelligent Inventory Tracking Using RFID and AI

Tarun Mehta¹, Dr. Bhavana R²

¹RFID Systems Engineer, Oracle India

²Logistics Research Professor, Manipal Institute of Technology, India

Abstract: Efficient inventory tracking is essential for supply chain management, warehouse operations, and retail logistics to ensure accurate stock management and operational efficiency. Traditional inventory tracking systems often face challenges related to manual data entry, stock mismatches, delayed updates, and limited real-time visibility. This paper presents an Intelligent Inventory Tracking System using Radio Frequency Identification (RFID), Artificial Intelligence (AI), and Internet of Things (IoT) technologies to improve inventory accuracy and automated monitoring. The proposed framework integrates RFID tags, smart readers, wireless communication modules, and machine learning algorithms to track inventory movement and analyze stock patterns in real time. AI-based analytics are utilized to predict inventory demand, identify abnormal stock activities, optimize warehouse operations, and reduce inventory losses. The system also enables remote monitoring, cloud-based data management, and automated alerts for efficient inventory control. Experimental evaluation demonstrates improved tracking accuracy, reduced operational costs, enhanced supply chain visibility, and better inventory optimization compared to traditional tracking methods. The study highlights the significance of AI and RFID integration in developing intelligent and scalable inventory management infrastructure for modern logistics and retail environments.

Keywords: Artificial Intelligence, RFID Technology, Inventory Tracking, Internet of Things (IoT), Smart Logistics, Machine Learning, Warehouse Automation, Supply Chain Management, Real-Time Monitoring, Intelligent Inventory Systems

AI-Based Human Detection Systems Using Smart Sensors

Dr. Vivek Anand², Harini S²

¹AI Scientist, DRDO Research Centre, India

²Embedded Systems Developer, Intel India

Abstract: Human detection technologies play a significant role in security surveillance, industrial automation, healthcare monitoring, and smart city applications. Traditional detection systems often face limitations related to accuracy, environmental adaptability, and real-time response capabilities. This paper presents an AI-Based Human Detection System using smart sensors, computer vision, and Internet of Things (IoT) technologies to improve intelligent monitoring and automated detection processes. The proposed framework integrates motion sensors, infrared sensors, smart cameras, and machine learning algorithms to identify human presence and activities in real time. Artificial intelligence techniques are utilized to analyze sensor data, recognize movement patterns, and distinguish human activities from environmental disturbances with high accuracy. IoT connectivity enables remote monitoring, automated alert generation, and centralized data management through cloud-based platforms. The system also supports intelligent surveillance, occupancy monitoring, and safety management for smart environments. Experimental evaluation demonstrates improved detection accuracy, faster response time, reduced false detections, and enhanced operational efficiency compared to conventional human detection systems. The study highlights the significance of AI and IoT integration in developing reliable and intelligent human detection solutions for modern smart infrastructure applications.

Keywords: Artificial Intelligence, Human Detection Systems, Smart Sensors, Internet of Things (IoT), Machine Learning, Intelligent Surveillance, Computer Vision, Real-Time Monitoring, Smart Infrastructure, Automated Detection

Smart Pollution Monitoring Using Artificial Intelligence and IoT

Dr. Shyam Prasad², Kiran Dev²

¹Environmental AI Researcher, IIT Guwahati, India

²Data Scientist, Smart City Analytics Pvt Ltd, India

Abstract: Environmental pollution has become a major global concern affecting public health, climate conditions, and ecological sustainability. Traditional pollution monitoring systems often lack real-time data analysis, automated alert mechanisms, and intelligent prediction capabilities. This paper presents a Smart Pollution Monitoring System that integrates Artificial Intelligence (AI), Internet of Things (IoT), and environmental sensing technologies to improve pollution detection and environmental management. The proposed framework utilizes smart sensors and wireless communication networks to continuously monitor air quality, water contamination, noise levels, temperature, humidity, and harmful gas concentrations in real time. Machine learning algorithms analyze the collected environmental data to identify pollution patterns, predict hazardous conditions, and support intelligent decision-making for environmental protection. IoT connectivity enables cloud-based monitoring, remote access, and automated alert notifications through mobile and web platforms. Experimental evaluation demonstrates improved monitoring accuracy, faster pollution detection, enhanced environmental analytics, and efficient resource management compared to traditional monitoring systems. The study highlights the significance of AI and IoT integration in developing intelligent and sustainable environmental monitoring infrastructure for smart cities and ecological management applications.

Keywords: Artificial Intelligence, Pollution Monitoring, Internet of Things (IoT), Environmental Monitoring, Machine Learning, Smart Sensors, Air Quality Analysis, Smart Cities, Real-Time Monitoring, Sustainable Environmental Systems

AI-Powered Automation Frameworks for Smart Factories

Rohit Menon¹, Dr. Nisha Kapoor²

¹Automation Specialist, Bosch Global Software Technologies, India

²Professor, Department of AI & Robotics, Amrita University, India

Abstract: The rapid growth of Industry 4.0 technologies has accelerated the transformation of traditional manufacturing systems into intelligent and connected smart factories. Conventional industrial automation frameworks often face challenges related to limited adaptability, inefficient resource management, and lack of predictive decision-making capabilities. This paper presents an AI-Powered Automation Framework for Smart Factories that integrates Artificial Intelligence (AI), Internet of Things (IoT), robotics, and cloud computing technologies to enhance industrial productivity and operational efficiency. The proposed framework utilizes smart sensors, industrial robots, connected machines, and machine learning algorithms to monitor manufacturing processes, analyze production data, detect equipment failures, and optimize factory operations in real time. AI-based predictive analytics support automated quality control, predictive maintenance, resource optimization, and intelligent production scheduling. IoT connectivity enables centralized monitoring, remote access, and seamless communication between factory systems through cloud-based platforms. Experimental evaluation demonstrates improved manufacturing efficiency, reduced downtime, enhanced product quality, and optimized energy utilization compared to traditional factory automation systems. The study highlights the significance of AI-driven intelligent automation frameworks in developing sustainable, flexible, and highly efficient smart manufacturing environments.

Keywords: Artificial Intelligence, Smart Factories, Industrial Automation, Internet of Things (IoT), Industry 4.0, Machine Learning, Predictive Maintenance, Smart Manufacturing, Robotics, Intelligent Production Systems