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## Department of CSE [Artificial Intelligence & Machine Learning]

### Patents granted / published Summary

Academic Year	2025-2026	2024-2025	2023-2024	2022-2023
Patents granted	03	02	03	02
Patents published	15	16	07	07

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**Department of CSE [Artificial Intelligence & Machine Learning]**

**FACULTY PATENTS LIST (A.Y.2025-26)**

S. No	Application Number	Title of The Patent	Name of the Faculty	Patent Office Journal No	Published Date	Status
1	202541062007	A Cloud-Integrated Deep Learning Model for Environmental Condition Forecasting and Irrigation Decision Support in Agriculture	Dr. V Malsoru K Bhargava Triveni Nandana Dr. Mahesh Kotha	28/2025	11/07/2025	Published
2	202541068179	Artificial Intelligence-Based Multi-Resolution Image Fusion System And Method For Enhanced Surveillance Application	Dr. K. Mohana Lakshmi	30/2025	25/07/2025	Published
3	456324-001	Machine Learning Based Colour Guided Material Handling Robotic Device	Shaik Sharif	08/2025	21/08/2025	Granted
4	477699-001	IoT Based Wireless Network Device For Environment Monitoring	Dr. Mahesh Kotha	07/2026	22/10/2025	Granted
5	481111-001	Neural Network Training Accelerator Device For Real-Time Data Processing	Dr. K. Mohana Lakshmi	06/2026	21/11/2025	Granted
6	202541104559	Method And System For Automl-Driven Neural Architecture Search And Quantization For Tinyml Deployment On Microcontrollers	Dr D Maneiah	48/2025	28/11/2025	Published
7	202541104557	Method And System For Federated Continual Learning With Privacy-Preserving Gradient Compression For Edge Devices	G Mahabub Subhani	48/2025	28/11/2025	Published
8	202541104501	Method And System For Agentic World-Model Assisted Autonomous Decisioning With Safety Constrained Reward Shaping	K Bhargavai Triveni Nandana N Sandeep Kumar	48/2025	28/11/2025	Published

9	202541104498	Method And System For Foundation-Model Orchestration Across Heterogeneous Edge-Cloud Fabrics With Cost-Aware Model Slicing	B Ravindernaik	48/2025	28/11/2025	Published
10	202541102792	Integrated Platform For Autonomous Decision-Making Using Artificial Intelligence Techniques	Dr T V Dharmajee Rao	48/2025	28/11/2025	Published
11	202541102793	System And Method For Real-Time Data Stream Prediction Using Neural Network Models	Arfa Mahvish	48/2025	28/11/2025	Published
12	202541102794	Machine Learning-Based Real-Time Decision Engine For Autonomous Operations	Dr V Malsoru	48/2025	28/11/2025	Published
13	202541101585	A System For Adaptive Graph-Based Pruning Of Ai Models On Edge Devices	V Ravindra Naik	48/2025	28/11/2025	Published
14	202541101584	A System For Adaptive Iot Sensor Calibration Using Continual Learning Models	M Ravindran	48/2025	28/11/2025	Published
15	202541101581	A REAL-TIME VIDEO ANALYTICS SYSTEM USING SPIKING NEURAL NETWORKS FOR LOW-POWER EDGE ARTIFICIAL INTELLIGENCE	Dr Md Shareef	48/2025	28/11/2025	Published
16	202541101582	A MULTI-MODAL AI FRAMEWORK SYSTEM FOR AUTONOMOUS DRONE SWARMS IN DYNAMIC URBAN ENVIRONMENTS	Shaik Sharif	48/2025	28/11/2025	Published
17.	202641000686	IoT Integrated Machine Learning System For Automated Soil Classification And Intelligent Fertilizer Recommendation To Enhance Crop Yield.	Dr. Mahesh Kotha	03/2026	16/01/2026	Published

18	202641006329	A Context- sensitive emotion and sentiment detection system using deep NLP models.	Dr. Mahesh Kotha Dr.G.Vinoda Reddy	05/2026	30/01/2026	Published
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CO-ORDINATOR



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(12) PATENT APPLICATION PUBLICATION

(21) Application No.202541062007 A

(19) INDIA

(22) Date of filing of Application :29/06/2025

(43) Publication Date : 11/07/2025

(54) Title of the invention : A Cloud-Integrated Deep Learning Model for Environmental Condition Forecasting and Irrigation Decision Support in Agriculture

(51) International classification :G06N002000000, G16H0050200000, I104L0067120000, G06T0007000000, I104L0067100000

(86) International Application No :NA  
Filing Date :NA

(87) International Publication No : NA

(61) Patent of Addition to Application Number :NA  
Filing Date :NA

(62) Divisional to Application Number :NA  
Filing Date :NA

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(57) Abstract :

The innovation offers a cloud-integrated solution that uses deep learning to predict environmental conditions and assist with agricultural irrigation decisions. The solution allows for better water use and enhanced agricultural efficiency by fusing cloud-based predictive analytics with IoT-based real-time data collecting. It has a decision support module, a forecasting engine, and a user dashboard for oversight and management.

No. of Pages : 15 No. of Claims : 7

(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :17/07/2025

(21) Application No.202541068179 A

(43) Publication Date : 25/07/2025

(54) Title of the invention : ARTIFICIAL INTELLIGENCE-BASED MULTI-RESOLUTION IMAGE FUSION SYSTEM AND METHOD FOR ENHANCED SURVEILLANCE APPLICATIONS

(51) International classification :G06T0005500000, G06N0003080000, G06V0020580000, F21V0023040000, G06T0003400700

(86) International Application No :NA  
Filing Date :NA

(87) International Publication No :NA

(61) Patent of Addition to Application Number :NA  
Filing Date :NA

(62) Divisional to Application Number :NA  
Filing Date :NA

(71)Name of Applicant :

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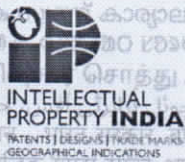
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(57) Abstract :

The present invention relates to an Artificial Intelligence-Based Multi-Resolution Image Fusion System and Method for Enhanced Surveillance Applications. The system integrates image data from multiple heterogeneous sensors—such as visible light, thermal, and infrared cameras—operating at different resolutions, and processes them using a deep learning-based fusion engine to generate a single high-resolution composite image. Key components include preprocessing, semantic alignment, and adaptive AI-guided fusion, with a feedback mechanism that dynamically refines fusion parameters based on downstream object detection and classification outputs. The invention enhances image clarity, improves recognition accuracy, and ensures real-time adaptability under varying environmental conditions, making it suitable for public safety, defense, and smart infrastructure surveillance scenarios.

No. of Pages : 19 No. of Claims : 10





**पेटेंट कार्यालय, भारत सरकार | The Patent Office, Government Of India**

**डिजाइन के पंजीकरण का प्रमाण पत्र | Certificate of Registration of Design**

डिजाइन सं. / Design No. : 477699-001

तारीख / Date : 22/10/2025

पारस्परिकता तारीख / Reciprocity Date\* :

देश / Country :

प्रमाणित किया जाता है कि संलग्न प्रति में वर्णित डिजाइन जो **IOT BASED WIRELESS NETWORK DEVICE FOR ENVIRONMENT MONITORING** से संबंधित है, का पंजीकरण, श्रेणी 14-02 में 1.Dr. Mahesh Kotha 2. J Prasanna Babu 3.Dr. Suraya Mubeen 4.Tabeen Fatima 5.Saba Sultana 6.Swarna Venkatesh 7.Marri Sireesha 8.B P Deepak Kumar 9.Dr. Voruganti Naresh Kumar के नाम में उपर्युक्त संख्या और तारीख में कर लिया गया है।

Certified that the design of which a copy is annexed hereto has been registered as of the number and date given above in class 14-02 in respect of the application of such design to **IOT BASED WIRELESS NETWORK DEVICE FOR ENVIRONMENT MONITORING** in the name of 1.Dr. Mahesh Kotha 2. J Prasanna Babu 3.Dr. Suraya Mubeen 4.Tabeen Fatima 5.Saba Sultana 6.Swarna Venkatesh 7.Marri Sireesha 8.B P Deepak Kumar 9.Dr. Voruganti Naresh Kumar.

डिजाइन अधिनियम, 2000 तथा डिजाइन नियम, 2001 के अध्याधीन प्रावधानों के अनुसरण में।

In pursuance of and subject to the provisions of the Designs Act, 2000 and the Designs Rules, 2001.



*(Signature)*  
उत्ता म. पी. डी. ए.  
महानियंत्रक पेटेंट, डिजाइन और व्यापार चिह्न

जारी करने की तिथि : 09/02/2026  
Date of Issue

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\*पारस्परिकता तारीख (यदि कोई हो) जिसकी अनुमति दी गई है तथा देश का नाम। डिजाइन का स्वत्वाधिकार पंजीकरण की तारीख से दस वर्षों के लिए होगा जिसका विस्तार, अधिनियम एवं नियम के निबंधनों के अधीन, पाँच वर्षों की अतिरिक्त अवधि के लिए किया जा सकता। इस प्रमाण पत्र का उपयोग विधिक कार्यवाहियों अथवा विदेश में पंजीकरण प्राप्त करने के लिए नहीं हो सकता है।  
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**पेटेंट कार्यालय, भारत सरकार The Patent Office, Government Of India**

**डिजाइन के पंजीकरण का प्रमाण पत्र Certificate of Registration of Design**

डिजाइन सं. / Design No. : 481111-001

तारीख / Date : 21/11/2025

पारस्परिकता तारीख / Reciprocity Date\* :

देश / Country :

प्रमाणित किया जाता है कि संलग्न प्रति में वर्णित डिजाइन जो **NEURAL NETWORK TRAINING ACCELERATOR DEVICE FOR REAL-TIME DATA PROCESSING** से संबंधित है, का पंजीकरण, श्रेणी 14-02 में 1.Dr. C. S. Boopathi 2. Dr. D. Lalitha Kumari 3.Dr. D. Subbarao 4.Dr. D. Shanthi 5.Dr. K. Mohana Lakshmi के नाम में उपर्युक्त संख्या और तारीख में कर लिया गया है।

Certified that the design of which a copy is annexed hereto has been registered as of the number and date given above in class 14-02 in respect of the application of such design to **NEURAL NETWORK TRAINING ACCELERATOR DEVICE FOR REAL-TIME DATA PROCESSING** in the name of 1.Dr. C. S. Boopathi 2. Dr. D. Lalitha Kumari 3.Dr. D. Subbarao 4.Dr. D. Shanthi 5.Dr. K. Mohana Lakshmi.

डिजाइन अधिनियम, 2000 तथा डिजाइन नियम, 2001 के अध्याधीन प्रावधानों के अनुसारण में।  
In pursuance of and subject to the provisions of the Designs Act, 2000 and the Designs Rules, 2001.



*(Signature)*  
उज्ज्वल सिंह  
महानियंत्रक पेटेंट, डिजाइन और व्यापार चिह्न

जारी करने की तिथि : 05/02/2026  
Date of Issue

\*पारस्परिकता तारीख (यदि कोई हो) जिसकी अनुमति दी गई है तथा देश का नाम। डिजाइन का स्वत्वधिकार पंजीकरण की तारीख से दस वर्षों के लिए होगा जिसका विस्तार, अधिनियम एवं नियम के निबंधनों के अधीन, पाँच वर्षों की अतिरिक्त अवधि के लिए किया जा सकता है। इस प्रमाण पत्र का उपयोग विधिक कार्यवाहियों अथवा विदेश में पंजीकरण प्राप्त करने के लिए नहीं हो सकता है।  
The reciprocity date (if any) which has been allowed and the name of the country. Copyright in the design will subsist for ten years from the date of Registration, and may under the terms of the Act and Rules, be extended for a further period of five years. This Certificate is not for use in legal proceedings or for obtaining registration abroad.

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202541104559 A

(19) INDIA

(22) Date of filing of Application :29/10/2025

(43) Publication Date : 28/11/2025

(54) Title of the invention : METHOD AND SYSTEM FOR AUTOML-DRIVEN NEURAL ARCHITECTURE SEARCH AND QUANTIZATION FOR TINYML DEPLOYMENT ON MICROCONTROLLERS

(51) International classification	:G06N0003045000, G06N0003080000, G06N0003082000, G06N0003040000, G06N0003063000	(71)Name of Applicant :
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(33) Name of priority country	:NA	<b>2)CMR College of Engineering &amp; Technology</b>
(86) International Application No	:NA	<b>3)CMR Institute of Technology</b>
Filing Date	:	(72)Name of Inventor :
(87) International Publication No	:01/01/1900	<b>1)Dr D Manciah</b>
(61) Patent of Addition to Application Number	: NA	
Filing Date	:NA	
(62) Divisional to Application Number	:NA	
Filing Date	:NA	

(57) Abstract :

The present invention provides a system and method for AutoML-driven neural architecture search and quantization tailored for TinyML deployment on microcontrollers. The invention automatically generates and evaluates candidate neural network architectures, applies hardware-aware quantization, and deploys optimized models to constrained devices. A feedback module monitors inference performance, enabling iterative refinement to meet memory, latency, and energy efficiency requirements. The invention significantly reduces manual intervention, improves deployment scalability, and ensures high-accuracy, energy-efficient operation for diverse TinyML applications, including IoT, wearable electronics, and sensor networks.

No. of Pages : 15 No. of Claims : 10

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202541104557 A

(19) INDIA

(22) Date of filing of Application :29/10/2025

(43) Publication Date : 28/11/2025

(54) Title of the invention : METHOD AND SYSTEM FOR FEDERATED CONTINUAL LEARNING WITH PRIVACY-PRESERVING GRADIENT COMPRESSION FOR EDGE DEVICES

(51) International classification	:G06F0021620000, G06N0020000000, G06N0003084000, G06N0003080000, G06F0021640000	(71)Name of Applicant : <b>1)CMR Technical Campus</b> Address of Applicant :KANDLAKOYA VILLAGE, MEDCHAL MANDAL, R. R DISTRICT, HYDERABAD 501401 TELANGANA, INDIA HYDERABAD Telangana India <b>2)CMR College of Engineering &amp; Technology</b> <b>3)CMR Institute of Technology</b>
(31) Priority Document No	:NA	(72)Name of Inventor : <b>1)G Mahabub Subhani</b>
(32) Priority Date	:NA	
(33) Name of priority country	:NA	
(86) International Application No	:	
Filing Date	:01/01/1900	
(87) International Publication No	: NA	
(61) Patent of Addition to Application Number	:NA	
Filing Date	:NA	
(62) Divisional to Application Number	:NA	
Filing Date	:NA	

(57) Abstract :

The invention provides a federated continual learning system for edge devices that enables collaborative model training without centralizing sensitive data. The system integrates privacy-preserving gradient compression to optimize communication efficiency while maintaining data confidentiality. Edge devices perform continual learning on local data streams, transmit compressed and privacy-protected gradients to a central server, which aggregates updates to improve a global model. Adaptive mechanisms mitigate catastrophic forgetting, balance resource utilization, and ensure robustness across heterogeneous devices. The invention supports scalable, efficient, and secure deployment of edge-based machine learning in dynamic environments.

No. of Pages : 17 No. of Claims : 10

(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :29/10/2025

(21) Application No.202541104501 A

(43) Publication Date : 28/11/2025

(54) Title of the invention : METHOD AND SYSTEM FOR AGENTIC WORLD-MODEL ASSISTED AUTONOMOUS DECISIONING WITH SAFETY-CONSTRAINED REWARD SHAPING

(51) International classification	:G06Q0030020700, G06N0003080000, G06N0003006000, G06N0020000000, G06F0021530000	(71)Name of Applicant : <b>1)CMR Technical Campus</b> Address of Applicant :KANDLAKOYA VILLAGE, MEDCHAL MANDAL, R. R DISTRICT, HYDERABAD 501401 TELANGANA, INDIA HYDERABAD Telangana India <b>2)CMR College of Engineering &amp; Technology</b> <b>3)CMR Institute of Technology</b>
(31) Priority Document No	:NA	(72)Name of Inventor :
(32) Priority Date	:NA	<b>1)K Bhargavai Triveni Nandana</b>
(33) Name of priority country	:NA	<b>2)N Sandeep Kumar</b>
(86) International Application No	:	<b>3)V Prathyusha</b>
Filing Date	:01/01/1900	
(87) International Publication No	:NA	
(61) Patent of Addition to Application Number	:NA	
Filing Date	:NA	
(62) Divisional to Application Number	:NA	
Filing Date	:NA	

(57) Abstract :

The invention discloses a method and system for agentic world-model assisted autonomous decisioning with safety-constrained reward shaping. The system comprises an agentic decisioning module, a world-model engine, a safety-constrained reward shaping engine, an execution environment interface, and a monitoring and feedback loop. The method involves generating predictive trajectories of the environment, simulating possible actions, filtering unsafe trajectories, reshaping rewards based on safety constraints, and executing the action that maximizes the reshaped reward. The invention ensures robust, adaptable, and interpretable autonomous decisioning while embedding safety as a core component of reward optimization.

No. of Pages : 15 No. of Claims : 10

(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :29/10/2025

(21) Application No.202541104498 A

(43) Publication Date : 28/11/2025

(54) Title of the invention : METHOD AND SYSTEM FOR FOUNDATION-MODEL ORCHESTRATION ACROSS HETEROGENEOUS EDGE-CLOUD FABRICS WITH COST-AWARE MODEL SLICING

(51) International classification	:G06F0009500000, G06F0021620000, G06F0016270000, H04L0067100000, G06F0009455000	(71)Name of Applicant :
(31) Priority Document No	:NA	<b>1)CMR Technical Campus</b>
(32) Priority Date	:NA	Address of Applicant :KANDLAKOYA VILLAGE, MEDCHAL MANDAL, R. R DISTRICT, HYDERABAD 501401 TELANGANA, INDIA HYDERABAD Telangana India
(33) Name of priority country	:NA	<b>2)CMR College of Engineering &amp; Technology</b>
(86) International Application No	:NA	<b>3)CMR Institute of Technology</b>
Filing Date	:	(72)Name of Inventor :
(87) International Publication No	:01/01/1900	<b>1)B Ravindernaik</b>
(61) Patent of Addition to Application Number	:NA	
Filing Date	:NA	
(62) Divisional to Application Number	:NA	
Filing Date	:NA	

(57) Abstract :

The invention provides a method and system for orchestrating foundation models across heterogeneous edge-cloud fabrics with cost-aware model slicing. The system partitions large models into slices, dynamically deploying them across edge nodes and cloud servers based on resource availability, network latency, and operational cost. Real-time monitoring, predictive analytics, and adaptive routing enable efficient, low-latency inference while minimizing expenditure. Privacy-preserving mechanisms allow sensitive data processing locally, ensuring regulatory compliance. The invention enhances scalability, fault tolerance, energy efficiency, and reliability in distributed AI deployments.

No. of Pages : 16 No. of Claims : 10

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202541102792 A

(19) INDIA

(22) Date of filing of Application :24/10/2025

(43) Publication Date : 28/11/2025

(54) Title of the invention : INTEGRATED PLATFORM FOR AUTONOMOUS DECISION-MAKING USING ARTIFICIAL INTELLIGENCE TECHNIQUES

(51) International classification	:G06N0003080000, G06N0020000000, G16H0050200000, G06N0003045000, G06F0016250000	(71)Name of Applicant : 1)CMR College of Engineering & Technology Address of Applicant :CMR College of Engineering & Technology, Kandlakoya (V), Medchal Road, Medchal, Hyderabad- 501401, Telangana Kandlakoya Telangana India
(31) Priority Document No	:NA	2)CMR Institute of Technology
(32) Priority Date	:NA	3)CMR Technical Campus
(33) Name of priority country	:NA	(72)Name of Inventor :
(86) International Application No	:	1)D Ranadeep Reddy
Filing Date	:01/01/1900	2)Ch Priyanka
(87) International Publication No	:NA	3)Mr B Pradeep
(61) Patent of Addition to Application Number	:NA	4)Mr B Anil Kumar
Filing Date	:NA	5)Dr T V Dharmajee Rao
(62) Divisional to Application Number	:NA	6)Dr B Shankar Nayak
Filing Date	:NA	

(57) Abstract :

An integrated platform for autonomous decision-making is disclosed. The integrated platform includes a data acquisition module configured to receive real-time and historical data from heterogeneous data sources. A preprocessing engine configured to normalize, filter, and transform the received data into structured representations. A decision intelligence core comprising one or more artificial intelligence models configured to generate autonomous decisions based on the structured representations. The artificial intelligence models include at least one of: a reinforcement learning model, a deep neural network, or a probabilistic inference engine. A contextual knowledge repository is configured to store domain-specific rules, constraints, and prior decision outcomes. A decision orchestration engine is configured to integrate outputs from the decision intelligence core with the contextual knowledge repository to produce an optimized decision. An execution interface is configured to communicate the optimized decision to external systems for implementation. Figure 1

No. of Pages : 17 No. of Claims : 10

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202541102793 A

(19) INDIA

(22) Date of filing of Application :24/10/2025

(43) Publication Date : 28/11/2025

(54) Title of the invention : SYSTEM AND METHOD FOR REAL-TIME DATA STREAM PREDICTION USING NEURAL NETWORK MODELS

(51) International classification	:G06N0003045000, G06N0003080000, G06N0020000000, H04L0067120000, G05B0013020000	(71)Name of Applicant : <b>1)CMR College of Engineering &amp; Technology</b> Address of Applicant :CMR College of Engineering & Technology, Kandlakoya (V), Medchal Road, Medchal, Hyderabad- 501401, Telangana Kandlakoya Telangana India
(31) Priority Document No	:NA	<b>2)CMR Institute of Technology</b>
(32) Priority Date	:NA	<b>3)CMR Technical Campus</b>
(33) Name of priority country	:NA	(72)Name of Inventor :
(86) International Application No	:	<b>1)A Samatha</b>
Filing Date	:01/01/1900	<b>2)U Hemalatha</b>
(87) International Publication No	: NA	<b>3)Ch Swapna</b>
(61) Patent of Addition to Application Number	:NA	<b>4)M Divya Sree</b>
Filing Date	:NA	<b>5)Arfa Mahvish</b>
(62) Divisional to Application Number	:NA	<b>6)M Anusha</b>
Filing Date	:NA	

(57) Abstract :

A low-latency system for real-time prediction of data streams is disclosed. The system includes a data acquisition module configured to receive continuous data streams from one or more heterogeneous sources. An edge processing module configured to preprocess the data streams locally at or near the source, the preprocessing including normalization, feature extraction, and dimensionality reduction. An adaptive neural network prediction module comprising one or more neural network models configured to generate predictions in real-time and to update their parameters dynamically based on incoming data and feedback. A prediction dissemination module configured to transmit the generated predictions to downstream systems or users with minimal latency. A model optimization module configured to perform online learning or incremental model retraining using recent data, feedback, and error metrics to continuously improve prediction accuracy.

No. of Pages : 18 No. of Claims : 10

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202541102794 A

(19) INDIA

(22) Date of filing of Application :24/10/2025

(43) Publication Date : 28/11/2025

(54) Title of the invention : MACHINE LEARNING-BASED REAL-TIME DECISION ENGINE FOR AUTONOMOUS OPERATIONS

(51) International classification	:G06N0020000000, G06N0003080000, G05D0001000000, G06N0003045000, G16H0050200000	(71)Name of Applicant : <b>1)CMR College of Engineering &amp; Technology</b> Address of Applicant :CMR College of Engineering & Technology, Kandlakoya (V), Medchal Road, Medchal, Hyderabad- 501401, Telangana Kandlakoya Telangana India
(31) Priority Document No	:NA	<b>2)CMR Institute of Technology</b>
(32) Priority Date	:NA	<b>3)CMR Technical Campus</b>
(33) Name of priority country	:NA	(72)Name of Inventor :
(86) International Application No	:	<b>1)D Madhavi</b>
Filing Date	:01/01/1900	<b>2)A Hima Bindu</b>
(87) International Publication No	: NA	<b>3)Ms Kilari Rampriya</b>
(61) Patent of Addition to Application Number	:NA	<b>4)Ms M Mounika</b>
Filing Date	:NA	<b>5)Dr V Malsoru</b>
(62) Divisional to Application Number	:NA	<b>6)Dr A Mahender</b>
Filing Date	:NA	

(57) Abstract :

A machine learning-based real-time decision engine system for autonomous operations is disclosed. The machine learning-based real-time decision engine system includes a data acquisition module configured to collect real-time operational data from one or more sensors, devices, or networked components. A feature extraction module is configured to process the collected data to identify relevant features indicative of system state. A machine learning inference module is configured to apply a trained machine learning model to the extracted features to generate actionable decisions. A decision execution module is configured to autonomously execute or recommend actions based on the generated decisions. A feedback module configured to monitor outcomes of executed decisions and provide performance data to the machine learning inference module for continuous model adaptation. Figure 1

No. of Pages : 17 No. of Claims : 10

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202541101585 A

(19) INDIA

(22) Date of filing of Application :22/10/2025

(43) Publication Date : 28/11/2025

(54) Title of the invention : A SYSTEM FOR ADAPTIVE GRAPH-BASED PRUNING OF AI MODELS ON EDGE DEVICES

(51) International classification	:G06N0003082000, G06N0003045000, G06N0003080000, G06F0016901000, G06F0011340000	(71)Name of Applicant : 1)CMR Institute of Technology Address of Applicant :Kandlakoya, Medchal Road, Hyderabad, Telangana, India, 501401 Kandlakoya Telangana India 2)CMR TECHNICAL CAMPUS 3)CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(31) Priority Document No	:NA	(72)Name of Inventor : 1)Mrs T Bhavani 2)Mrs Talari Swapna 3)V Ravindra Naik 4)Sanjib Kumar Nayak 5)M Anitha 6)A Spandana
(32) Priority Date	:NA	
(33) Name of priority country	:NA	
(86) International Application No	:	
Filing Date	:01/01/1900	
(87) International Publication No	: NA	
(61) Patent of Addition to Application Number	:NA	
Filing Date	:NA	
(62) Divisional to Application Number	:NA	
Filing Date	:NA	

(57) Abstract :

ABSTRACT A system for adaptive graph-based pruning of neural network models on edge devices is provided. The system comprises a graph representation module configured to represent a neural network as a graph of nodes and edges, where nodes represent neurons and edges represent connections. A pruning module identifies and removes redundant or less significant nodes and edges to reduce model size and computational complexity. A performance monitoring module collects real-time metrics, including accuracy, latency, memory usage, and energy consumption, on the edge device. A dynamic adjustment module modifies pruning strategies based on the monitored metrics to maintain a balance between efficiency and predictive accuracy. A feedback mechanism iteratively updates the graph representation and pruning decisions based on performance feedback, enabling continuous optimization of the neural network. The system allows deployment of lightweight, high-performance AI models on resource-constrained edge devices while preserving predictive accuracy. Figure 1

No. of Pages : 18 No. of Claims : 10

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202541101584 A

(19) INDIA

(22) Date of filing of Application :22/10/2025

(43) Publication Date : 28/11/2025

(54) Title of the invention : A SYSTEM FOR ADAPTIVE IOT SENSOR CALIBRATION USING CONTINUAL LEARNING MODELS

(51) International classification	:G06N0020000000, G06N0003080000, H04W0064000000, H04L0067120000, G01S0007497000	(71)Name of Applicant : 1)CMR Institute of Technology Address of Applicant :Kandlakoya, Medchal Road, Hyderabad, Telangana, India, 501401 Kandlakoya Telangana India 2)CMR TECHNICAL CAMPUS 3)CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(31) Priority Document No	:NA	(72)Name of Inventor : 1)Mrs V Surekha
(32) Priority Date	:NA	2)Mrs B Annapoorna
(33) Name of priority country	:NA	3)M Ravindran
(86) International Application No	:	4)A Veerender
Filing Date	:01/01/1900	5)Dr Y Ambica
(87) International Publication No	:NA	6)K Sudhakar Reddy
(61) Patent of Addition to Application Number	:NA	
Filing Date	:NA	
(62) Divisional to Application Number	:NA	
Filing Date	:NA	

(57) Abstract :

A system for adaptive IoT sensor calibration using continual learning models, comprising a plurality of IoT sensor nodes, each node including one or more sensors configured to generate raw measurement data and a memory-bounded continual learning calibration agent stored in a processor-readable medium. The calibration agent receives streaming sensor data, maintains a compressed episodic buffer of representative calibration samples, updates a local calibration model online using uncertainty estimation and physics-informed regularization, and generates corrected sensor values. The system further comprises a federated aggregation server communicatively coupled with the sensor nodes, the server configured to receive privacy-preserving model update parameters and sensor profile metadata, aggregate the updates using a heterogeneity-aware weighting scheme, and transmit aggregated or personalized calibration parameters back to the sensor nodes. An energy-aware scheduler on each sensor node dynamically selects between local retraining, federated communication, or deferred calibration based on energy availability, network cost, and calibration error thresholds. Figure 1

No. of Pages : 20 No. of Claims : 10

(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :22/10/2025

(21) Application No.202541101581 A

(43) Publication Date : 28/11/2025

(54) Title of the invention : A REAL-TIME VIDEO ANALYTICS SYSTEM USING SPIKING NEURAL NETWORKS FOR LOW-POWER EDGE ARTIFICIAL INTELLIGENCE

(51) International classification	:G06N0003049000, G06N0003080000, G06N0003063000, G06V0020400000, G06V0020520000	(71)Name of Applicant :
(31) Priority Document No	:NA	<b>1)CMR Institute of Technology</b>
(32) Priority Date	:NA	Address of Applicant :Kandlakoya, Medchal Road, Hyderabad, Telangana, India, 501401 Kandlakoya Telangana India
(33) Name of priority country	:NA	<b>2)CMR TECHNICAL CAMPUS</b>
(86) International Application No	:	<b>3)CMR COLLEGE OF ENGINEERING &amp; TECHNOLOGY</b>
Filing Date	:01/01/1900	(72)Name of Inventor :
(87) International Publication No	:NA	<b>1)Mr P V Madhusudhan</b>
(61) Patent of Addition to Application Number	:NA	<b>2)Ms S Parimala</b>
Filing Date	:NA	<b>3)Dr Md Shareef</b>
(62) Divisional to Application Number	:NA	<b>4)Dr B Mohan Babu</b>
Filing Date	:NA	<b>5)Dr L Chandra Shekar Reddy</b>
		<b>6)Md Tanweer Alam</b>

(57) Abstract :

A real-time video analytics system using spiking neural networks for low-power edge artificial intelligence is disclosed. The system includes an event-based vision sensor configured to generate asynchronous event data from a video scene, and a spiking neural network processor adapted to process the event data to perform video analytics such as object detection, recognition, and tracking in real time. An adaptive control module regulates the operation of the vision sensor and the processor according to scene activity or available power conditions, thereby reducing energy consumption while maintaining performance. An on-device learning module updates synaptic weights of the spiking neural network using lightweight learning rules, enabling continual adaptation to new objects or environments without reliance on cloud resources. The integrated architecture allows efficient, low-latency video analytics suitable for surveillance, robotics, wearable devices, and other edge applications requiring both real-time response and extended battery life. Figure 1

No. of Pages : 19 No. of Claims : 10

(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :22/10/2025

(21) Application No.202541101582 A

(43) Publication Date : 28/11/2025

(54) Title of the invention : A MULTI-MODAL AI FRAMEWORK SYSTEM FOR AUTONOMOUS DRONE SWARMS IN DYNAMIC URBAN ENVIRONMENTS

(51) International classification	:G05D0001000000, G08G0005000000, B64C0039020000, G08G0005040000, G06Q0050260000	(71)Name of Applicant : <b>1)CMR Institute of Technology</b> Address of Applicant :Kandlakoya, Medchal Road, Hyderabad, Telangana, India, 501401 Kandlakoya Telangana India <b>2)CMR TECHNICAL CAMPUS</b> <b>3)CMR COLLEGE OF ENGINEERING &amp; TECHNOLOGY</b>
(31) Priority Document No	:NA	(72)Name of Inventor : <b>1)Ms P.Anusha</b>
(32) Priority Date	:NA	<b>2)Mrs K. Jyothsna</b>
(33) Name of priority country	:NA	<b>3)Shaik Sharif</b>
(86) International Application No	:	<b>4)B Ramji</b>
Filing Date	:01/01/1900	<b>5)M Parameswar</b>
(87) International Publication No	: NA	<b>6)J Manasa</b>
(61) Patent of Addition to Application Number	:NA	
Filing Date	:NA	
(62) Divisional to Application Number	:NA	
Filing Date	:NA	

(57) Abstract :

ABSTRACT The present invention provides a multi-modal AI framework system for autonomous drone swarms in dynamic urban environments. The system comprises a sensor fusion module configured to integrate real-time data from visual cameras, thermal imaging devices, and LiDAR sensors to generate a comprehensive environmental model. An adaptive path planning module determines optimal flight trajectories for each drone and dynamically updates them in response to environmental changes. A swarm coordination module enables decentralized communication and cooperative decision-making among drones to maintain cohesive swarm behavior, optimize task allocation, and enhance resilience. An urban adaptation layer processes city-specific information, including building layouts, traffic patterns, and signal interference, to guide navigation and mission execution. A control interface receives mission objectives and transmits execution instructions to each drone. The framework provides autonomous, real-time, and scalable operation of drone swarms, offering improved situational awareness, adaptive decision-making, and operational efficiency in complex urban environments. Figure 1

No. of Pages : 20 No. of Claims : 10

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202641000686 A

(19) INDIA

(22) Date of filing of Application :04/01/2026

(43) Publication Date : 16/01/2026

(54) Title of the invention : IOT INTEGRATED MACHINE LEARNING SYSTEM FOR AUTOMATED SOIL CLASSIFICATION AND INTELLIGENT FERTILIZER RECOMMENDATION TO ENHANCE CROP YIELD.

(51) International classification	:G06Q 50/02, G06N 20/00, A01C 21/00, A01B 79/00, A01C 15/00	(71)Name of Applicant : 1)Ravindra Changala Address of Applicant :4-1470/3,plot-94North,Street-4,Phase-I, Sharda Nagar, Vanasthalipuram,Hyderabad-50070 Telangana India 2)B Sree Saranya 3)Dr. Gangolu Yedukondalu 4)P Kiran Kumar 5)Dr. Annapurna Gummadi 6)Dr. Mahesh Kotha 7)Dr. G Vinoda Reddy 8)Mrs. Sreedevi Kadiayala 9)Yasaswini Kotamraju 10)Mrs. Y Sirisha 11)Siva Rama Krishna Prasad Changala 12)FNU Kareemunnisa
(31) Priority Document No	:NA	(72)Name of Inventor :
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(33) Name of priority country	:NA	2)B Sree Saranya
(86) International Application No	:	3)Dr. Gangolu Yedukondalu
Filing Date	:01/01/1900	4)P Kiran Kumar
(87) International Publication No	: NA	5)Dr. Annapurna Gummadi
(61) Patent of Addition to Application Number	:NA	6)Dr. Mahesh Kotha
Filing Date	:NA	7)Dr. G Vinoda Reddy
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Filing Date	:NA	9)Yasaswini Kotamraju
		10)Mrs. Y Sirisha
		11)Siva Rama Krishna Prasad Changala
		12)FNU Kareemunnisa

(57) Abstract :

In order to improve agricultural output, an Internet of Things (IoT) integrated machine learning system for intelligent fertilizer suggestion and automated soil categorization is shown. The system classifies soil types by applying machine learning algorithms to assess real-time soil characteristics collected by IoT-based soil sensors. It makes accurate fertilizer recommendations based on crop type, soil classification, and agronomic information. The invention encourages sustainable agriculture, lowers fertilizer usage, and increases crop output.

No. of Pages : 17 No. of Claims : 8

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202641006329 A

(19) INDIA

(22) Date of filing of Application :22/01/2026

(43) Publication Date : 30/01/2026

(54) Title of the invention : A CONTEXT-SENSITIVE EMOTION AND SENTIMENT DETECTION SYSTEM USING DEEP NLP MODELS

(51) International classification	:G06N 20/00, G06F 40/30, G06N 3/08, G06N 3/04, G06F 16/332	(71)Name of Applicant : 1)Mrs. Kasi Sailaja Address of Applicant :Mrs. Kasi Sailaja Assistant Professor, Department of Computer Science and Engineering, Guru Nanak Institutions Technical Campus (A), Hyderabad, Telangana, India - 501506. sreesaranyan akka@gmail.com Telangana India 2)Mrs. B Sree Saranya 3)Mr. Karthik Chitikala 4)Dr. Gangolu Yedukondalu 5)Dr. Ravindra Changala 6)Dr. Annapurna Gummadi 7)Dr.Mahesh Kotha 8)Mrs. Sreedevi Kadiayala 9)Dr. G Vinoda Reddy 10)M Srividya
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(32) Priority Date	:NA	
(33) Name of priority country	:NA	
(86) International Application No	:	
Filing Date	:01/01/1900	
(87) International Publication No	: NA	
(61) Patent of Addition to Application Number	:NA	
Filing Date	:NA	
(62) Divisional to Application Number	:NA	
Filing Date	:NA	

(57) Abstract :

ABSTRACT OF THE INVENTION: The invention presents a context-sensitive system for emotion and sentiment detection leveraging deep natural language processing (NLP) models. Designed for textual data in dynamic environments like social media and chat interfaces, it addresses limitations of traditional methods by incorporating contextual cues for precise analysis. The architecture includes: a preprocessing unit for tokenization and noise handling; a core context encoder based on transformer models (e.g., BERT) that generates rich embeddings capturing syntactic and semantic relationships across sentences; a fusion mechanism for multimodal elements like emojis; and a multi-head classifier predicting emotions (anger, joy, sadness, etc.) and sentiments with probabilistic outputs. Recurrent components handle sequential dependencies in conversations. In practice, the system analyzes input text by adjusting context windows adaptively, achieving low-latency inference suitable for edge devices. For a benchmark dataset of 20,000 tweets, it attains 93% accuracy in emotion detection, surpassing baselines by 18%, with F1-scores above 0.90 for complex cases like sarcasm. Applications span customer analytics, where it identifies dissatisfaction in 85% of flagged interactions, and mental health apps for real-time mood tracking. Novelty includes the entanglement of emotion-sentiment prediction via graph-based context modeling, enabling nuanced interpretations absent in prior art. This enhances AI empathy, reduces misclassifications, and supports multilingual scalability, fostering ethical, user-centric digital interactions.

No. of Pages : 18 No. of Claims : 6