



LOKPRITE DR. BALASAHU VIRDI PATIL  
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PRAVRA BHUSHAN EDUCATION SOCIETY'S

**SIR VISVESVARAYA INSTITUTE OF TECHNOLOGY**  
PRAVRA TECHNICAL EDUCATION CAMPUS NASHIK  
**NASHIK**

## Staff Self-Appraisal Form (A.Y. 2023-24)

Date: 24/06/2024

Staff Name:-	Trupti K. Wable
Department:-	E&TC Engineering
Designation:-	Assistant Professor
Assessment Year:-	2023-24

### 1) Teaching Process (10 Class Conducted + 10 Teaching Quality) (Max 20)

S. N	Name of the subject	Subject code	Branch	Class	Semester / Year	Total Work Load per week	No. of Lectures/ Practical/ Project Hrs. Scheduled	No. of Lectures/ Practical/ Project Hrs. Conducted
1	Modernized IoT	404184	E&TC	BE	Sem-I	Theory:03	Theory:36	Theory:36
2	Electrical & Hybrid Vehicle	403144	Electrical	SE		Theory:03	Theory:36	Theory:36
3	Modernized IoT Lab	404187	E&TC	BE		Practical:02	Practical:09	Practical:09
4	DBM Lab	310246	Computer	TE		Practical:06	Practical:13	Practical:13
5	Project Stage -I	404188	E&TC	BE		Project:02	Project:06	Project:06
6	Mobile Computing	404191	E&TC	BE	Sem-II	Theory:03	Theory:36	Theory:39
7	Mobile Computing Lab	404196	E&TC	BE		Practical:02	Practical:08	Practical:08
8	I & E	404193	E&TC	BE		Practical:02	Practical:06	Practical:06
9	Project Stage-II	404197	E&TC	BE		Project:06	Project:18	Project:18
Total (10 for Class Conducted+10 Teaching Quality )= 20								
Evaluation Mechanism								

Evaluation Mechanism:

**Score = Total No. of Class Conducted / Total no. of Scheduled Class X 10**

Approved by AICTE, New Delhi letter No. F-740-85-006 (I) / ET / 96 dt 15/10/1996  
DTE CODE IN 5125 • A/40 C-41381 • AICTE PERMANENT ID: 1-19640842

Address: A.P. Chaudhary, P.D. Sirokar, D.D. Nair, N.A.S. P.D. 422-102  
Ph. No. 422-2001, 2771776 / 2771779 | Website: www.pvtv.ac.in | Email: principal@pvtv.ac.in



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(PADMA BHUSHAN AWARDEE)  
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PRAVARA TECHNICAL EDUCATION CAMPUS NASHIK  
**NASHIK**

## 2) Student Feedback (25)

S. N.	Activity	Maximum Points	End User	Evaluator	Update frequency	Report :
1	Student Feedback	25	Students	Online System: Google Form	Twice in Semester: First: After one month Second: After two months	Average of all subject feedback of SEM-I and II
Average Feedback = 3.36 Out of 4 = 84 Out of 100						

## Evaluation Mechanism:

$$\text{Total Score} = \text{Average Feedback} \times 25 / 100 = 84 \times 25 / 100 = 21$$

## 3) Departmental Level Activities (10)

S. N.	Departmental Level Activities 1) Coordinator-02 2)Member-01 OR as mentioned in bracket	Maximum Points (A)	Performance /work completed on the scale of 1		Marks = A x C
			HOD Evaluator(B)	Principal Evaluator(C)	
1	Admission (FC/SC/ARC : In charge / Efforts Taken to improve Admissions)	01	01	01	
2	Alumni Coordinator (Department / Batch)	01	01	01	
3	Placement Contribution	01			
4	Student Mentoring / Counselling	01	01	01	
5	Consultancy				
6	CSR Activity / MOU				
7	Grants / Funds Received				
8	Conduction of Guest Lecture /Seminar/ Workshop/FDP/Training	02	01	01	
9	MOOCs/ NPTEL/Spoken Tutorial Coordinator				
10	Results (Academic Result Analysis)				
11	Academic In charge	01	01	01	
12	Class Teacher				
13	Maintenance In charge				
14	Cleanliness In charge				
15	College Magazine (In charge/ Member)	01	01	01	
16	Website In charge	01	01	01	
17	News bulletin (In charge / Member)				

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Address : A/p. Chincholi, Tal. Sinnar, Dist. Nashik (M.S.) PIN - 422 102  
Ph No. : +91-2551-271278 / 271179 | Website : www.pravara.in | Email : principal.svitnashik@pravara.in







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18	Departmental Library In charge	01	01	01	
19	Earn & Learn Scheme Coordinator				
20	ERP (MIS) In charge				
21	Feedback Coordinator (Student, Parent, Alumni & Event)				
22	Exam (Coordinator / Duty)	01			
23	Industrial Visit				
24	Local Chapter (Professional Bodies) Coordinator				
25	NBA/ NAAC Coordinator (3 Marks) Criteria Coordinator (2 Marks)	02			
26	Lab In charge	01	01	01	
27	Scholarship In charge				
28	Student Association / Chapter Coordinator				
29	Time Table In charge (3 Marks)	03	01	01	
30	Training & Placement In charge (3 Marks)				
31	Medicinal Garden IN charge				
32	Animal House In charge				
33	PG Coordinator				
34	Research & Development Coordinator				
35	Tinkerers' Laboratory				
36	NSS (National Service Scheme)				
37	Any Other (Mention) Fee Recovery of Students, Meri mati Mera desh data Collection,	01			
<b>Total =</b>		<b>18</b>	<b>10</b>	<b>10</b>	

#### 4] Institute Level Activities (10)

S. N.	College / Institute Level Activities 1) Coordinator-03 2) Member-02 OR as mentioned in bracket	Maximum Points (A)	Performance / fraction of work completed on the scale of 1		Marks = A x C
			HOD Evaluator (B)	Principal Evaluator (C)	
1	AQAC (Academic Quality Assurance Committee) / IQAC (Internal Quality Assurance Cell) (5Marks)				
2	HOD/ Dean (5Marks)				
3	Entrepreneurship Development In Charge / PRISM/IIC (5Marks)				
4	Examination In charge (5Marks)	05	02	02	
5	Internship / Training In charge (5Marks)				

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DTE CODE: UN 5125 • AISHE: C-41381 • AICTE PERMANENT ID: 1-19640842

Address : A/p, Chincholi, Tal. Sinnar, Dist. Nashik (M.S.) PIN - 422 102  
Ph No.: +91-2551-271278 / 271179 | Website : www.pravara.in | Email : principal.vitnashik@pravara.in



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6	NBA / NAAC Coordinator (5Marks)	02	02	02	
7	Training & Placement Officer (TPO) (5Marks)				
8	NSS-Program Officer (National Service Scheme) (5Marks)				
9	Cultural Coordinator (5Marks)	02	01	01	
10	Sport In charge (5Marks)				
11	FDP /Seminar /Workshop In charge/Training				
12	Gymkhana/Publicity/Gathering /Student Club Activity				
13	Hardware / Instrument Lab In charge				
14	Hostel / Rector / Warden				
15	IPR Activity				
16	Language Lab In charge / Communication Skill				
17	Skill Development In charge				
18	ERP (MIS/WCS) INCHARGE				
19	UNIVERSITY/ MSBTE /AICTE/ DTE /NIRF Coordinator				
20	Website In charge / News Bulletin	02	02	02	
21	Canteen In charge				
22	Grievance Cell/ ICC	02	01	01	
23	Academic	02	02	02	
24	Dairy Farm/Animal House				
25	College Farm/Medicinal Plant Garden				
26	Purchase				
27	Research & Development Coordinator				
28	Maintenance In charge				
29	Any other (Mention) Sangamner Bus Coordinator & Annual Report	02+02			
Total =		18	10	10	

### 5) Annual Confidential Report (10)

No	Activity	Maximum Points	HOD Evaluator	Principal Evaluator
1	Annual Confidential Report	10	08	08

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Address: A/p. Chincholi, Tal. Sinnar, Dist. Nashik (M.S.) PIN: 422 102  
Ph No.: +91-2551-271278 / 271179 | Website: www.pravara.in | Email: principal@pravara.in



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## 6] Research & Publications / Patent (Max 20)

S. N.	Activity (Research Publications / Patent) Note: Enclose Copy of First page of the paper		Maximum Points	HOD Evaluator	Principal Evaluator
	Details	First Corresponding / Joint authors			
1	Scopus/ WoS/UGC (IF/citescore = 1-2)	10.5	4.5		
	Scopus/ WoS/UGC (IF/citescore < 1)	7	3	7	07
	Scopus/ WoS/UGC (IF/citescore = 0)	3.5	1.5		
	Other Journals (With valid ISSN)	2	1	2	02
2	Books Nat. Pub./chapter	5/4	3/2		
	Books Int. Pub./chapter	7/5	4/3		
3	Scopus/IPC Conference	4	2	4	04
5	General Conference	02	01		
6	Patent Published	06	03	6	06
7	Patent Granted	12	06		
8	Awards/Recognition – University	3	NA		
	Awards/Recognition – State	5	NA		
	Awards/Recognition – Nat/Int	7	NA		
Total =			19	19	19

## 7] Contribution to Society and others (05)

S. N.	Activity (Contribution to Society) (Maximum point to each activity is one) Note: Enclose Proof	Maximum Points (05) (A)	Performance /work completed on the scale of 1 (Participation/Organization/involvement)		Marks = A x C
			HOD Evaluator (B)	Principal Evaluator (C)	
1	Blood donation/Health/Medical Camp	01 (Member of medical Camp organized by Sindhutai Vikhe Patil Memorial Hospital at Mohu)	01	01	
2	Yoga/Tree Plantation	01	01	01	
3	NSS/NCC/Literacy Camp		01	01	
4	Number of Endsem answer paper assessed =120	01	01	01	
5	Two FDPs/ Workshop/ STTPs attended (minimum one week)	01	01	01	

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Address: A/P. Chincholi, Tal. Sinnar, Dist. Nashik (M.S.) PIN - 422 102  
Ph No.: +91-2551-271278 / 271179 | Website: www.pravara.in | Email: principal.wtnashik@pravara.in



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(PADMA BHUSHAN AWARDEE)  
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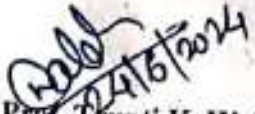
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6	Member/Reviewer of Referred Journals/Conference	01			
7	Any other point (Mention) Lifetime Membership of IAEEE	01			
Total =		06	05	05	


S. N	Activity	Maximum Points	HOD	Principal
1	Teaching Process (10 Class Conducted + 10 Teaching Quality)	20	20	20
2	Student Feedback	25	21	21
3	Departmental Level Activities	10	10	10
4	Institute Level Activities	10	10	10
5	Annual Confidential Report	10	08	08
6	Research & Publications / Patent	20	19	09
7	Contribution to Society	05	05	05
Total		100	93	93

Note: Enclose all Proof otherwise points claimed will not be considered.

Remark: ..... Recommended for increments. ....

  
Prof. Trupti K. Wable  
Sign and Date of Faculty

  
Dr. Rana S. Mahajan  
H.O.D

  
Dr. Ganesh B. Shinde  
Principal



# Enhancing Performance Parameters for Smart Video Surveillance Application with AIoT via Collaborative Cloud and Edge Computing

Ms. Trupti K. Wable, Dr. Rahul Mishra  
Department of Electronics & Communication,  
Dr. A. P. J. Abdul Kalam University, Indore

**Abstract.** The traditional cloud-based paradigm is under tremendous pressure on network bandwidth and communication latency, which is why a newly emerging paradigm of computing paradigm is involved. As a result, AIoT applications can be implemented in a cloud-based environment, where model building and model abuse are embedded in the cloud and edges, respectively. However, engineers still face the challenge of building AIoT systems in practice due to the natural diversity of IoT devices, diminishing accuracy of trained models, security and privacy issues, etc. In this paper, I want to introduce the development of an industrial edge- cloud based collaboration platform aimed at facilitating the implementation of AIoT applications. In addition, a land use case was filed in this paper, which proved the effectiveness of the AIoT application building on the platform. In this paper we simply do the comparatively study of edge system for surveillance and cloud-edge system for surveillance and measure various parameter using both system and conclude which system is best.

**Keyword :** Cloud-Edge collaboration, Cloud Computing, Edge Computing, Artificial Intelligence, Internet of Things.

## 1. Introduction

The world is quickly evolving and smart technologies are becoming increasingly ubiquitous. To truly harness the potential of the Internet of Things (IoT), smart, Internet-enabled devices must be able to effectively communicate and interact with one another and with their environment. One of the most important potential applications of these connected devices is video surveillance, which can provide valuable insights to security teams. But with so many devices and data streams to manage, how can one ensure that their video surveillance systems are operating at peak performance? Fortunately, the advent of artificial intelligence of things (AIoT) technologies, combined with collaborative cloud and edge computing, can help ensure maximum performance in smart video surveillance applications.

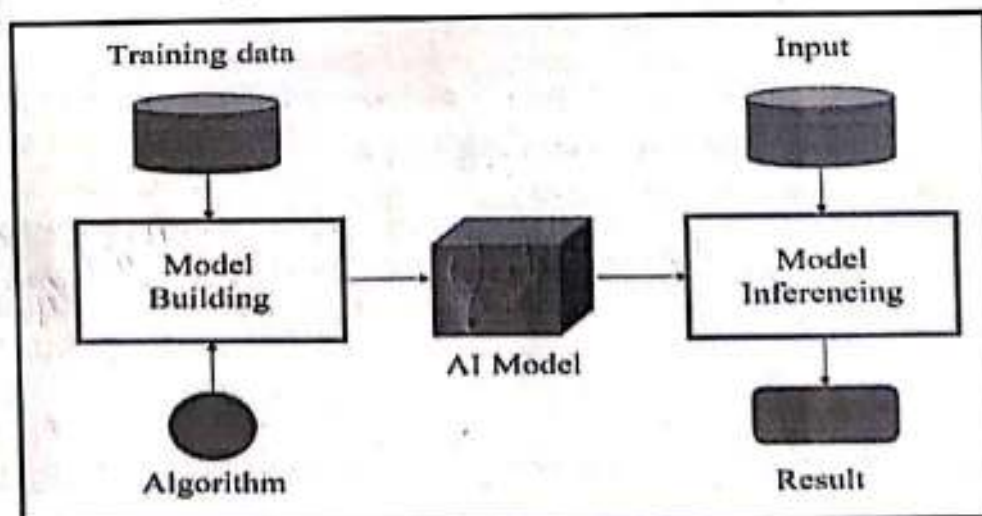


Figure 1: Two-stage process of an AI approach based



## USING A CLOUD-EDGE COLLABORATIVE SYSTEM- A SMART VIDEO SURVEILLANCE APPLICATION

Ms. Trupti K. Wable

Dr. Rahul Mishra

Department of Electronics & Communication,  
Dr. A. P. J. Abdul Kalam University, Indore  
Corresponding Author Email: [wabletrupti@gmail.com](mailto:wabletrupti@gmail.com)

### Abstract:

The system consists of Raspberry Pi cameras, distributed computing nodes in Cloud environment and edge devices installed into the monitoring sites. Local and cloud computing process are combined so that only vital functions such as action detection and image recognition are handled at the cloud level and other functions such as motion detection are processed at the edge level. This approach allows for real-time surveillance processing with low latency. It also helps reduce the network and computational costs associated with the solution since only the necessary data are transferred from the edge devices to the cloud environment. The final system is tested and evaluated on real-world surveillance data, and the results demonstrate its efficiency in terms of both response time and accuracy. This paper presents the construction of a smart video surveillance system based on Cloud-Edge Collaborative architecture. By combining cloud computing resources with edge devices, processing of video surveillance can be done with low latency and high accuracy. In this system, Raspberry Pi cameras were used to detect motion or detect actions, and the recognition of captured video actions was done at cloud environment. By deploying some functions at the edge devices, the network traffic can be reduced and the computational costs can be lowered. The system was tested and evaluated on real-world surveillance data, and the results showed that the proposed system had high accuracy and response time. The proposed method can provide an effective and cost-efficient solution for real-time video surveillance applications.

**Keywords:** Cloud-Edge collaboration, Cloud Computing, Edge Computing, Artificial Intelligence, Internet of Things.

### Introduction:

This system enables the real-time analysis of surveillance videos while sending the analysed information to a secure cloud storage. This system can also easily integrate with a variety of existing security systems. In addition, this system can reduce the processing load on servers by providing edge computing capabilities. Advantages

1. **Faster Detection:** With the help of cloud-edge collaborative system, it is easier to detect the movement of objects in the videos which can improve the accuracy of the detection.



# Home automation using Zigbee and STM32

Trupti K. Wable<sup>1</sup>, Gursal Shubhangi<sup>2</sup>, Kate Chaitali<sup>3</sup>, Aghav Shital<sup>4</sup>

<sup>1</sup> Assistant Prof, Sir Visvesvaraya Institute of Technology, Nashik University of Pune

<sup>2,3,4</sup> UG Students, Department of Electronics & Telecommunication,

Sir Visvesvaraya Institute of Technology, Nashik University of Pune

## Abstract

Automation is a huge subject and now a day may be carried out any wherein depending upon the software. ZigBee protocol IEEE 802.15.4 wireless widespread may be used to set up community for some precise application motive. ZigBee based domestic automation wireless sensor community may be carried out with small initial value and can be beneficial to manipulate enthusiasts, lighting and other home appliances which operation can be controlled with the help of a microcontroller. The house automation may be beneficial network for bodily handicapped men and women in addition to antique age character and the same community can be used to manage business packages as well. All the electrical appliances work independently from each other rather than collaborating as biological, organizational complete. home owners have no option but to trade with these messy house appliances that consumes many of time, power and finances from day to day. so, active office workers have been longing for an astute house scheme featuring detailed functioning, basic approach and available.

**Keywords:** STM32, Zigbee, Home Automation System, Assistive homes.

## 1. INTRODUCTION

At present human beings have more requirements for protectiveness, consolation, efficiency and opacity level of their home environment. Furthermore, all the electrical appliances work independently from each other rather than collaborating as biological, organizational complete. home owners have no option but to trade with these messy house appliances that consumes many of time, power and finances from day to day. Hence, active office workers have been longing for a astute house scheme featuring in-depth functioning, basic manner and available. Digital home management systems utilizing Zigbee and STM32 microcontrollers provide seamless comparison over diverse house appliances and equipment. Zigbee offers a low-power, wireless intercommunication protocol perfect for intelligent house applications, whereas STM32 microcontrollers provide strong processing power and suppleness for interfacing with detectors. With Zigbee and STM32, users can remotely supervise and comparison lighting, cold, security cameras, door locks, and more. The STM32 microcontroller copes information processing, contrivance agility, and user interaction, whereas Zigbee ensures dependable intercommunication with minimal power consumption. Basically, the mixture of Zigbee and STM32 allows effective and scalable automated home systems solutions with strong wireless connectivity and sophisticated processing abilities. This architecture enables intelligent automation and monitoring of various aspects of the home environment, enhancing convenience, comfort, and energy efficiency while providing users with greater control and flexibility.

## II. OBJECTIVE

To execute characteristics to supervise and optimize power usage, as an example scheduling equipment to pivot on/off at particular times or adjusting settings as said by occupancy or environmental ailments.

Enable seamless integration with current digital home management protocols and systems, as an example Wi-Fi, Bluetooth, or other Zigbee equipment, to generate a in-depth intelligent house natural habitat.

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of

PUBLICATION

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is hereby Awarding this Certificate to*

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*In Recognition of the Publication of the Paper Entitled  
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*(Nate)*

Editor In Chief







## Review on Home Automation using VHDL

Trupti K. Wable<sup>1</sup>, Gursal Shubhangi<sup>2</sup>, Kate Chaitali<sup>3</sup>, Aghav Shital<sup>4</sup>, Najagad Jayashri<sup>5</sup>

<sup>1</sup>Assistant Prof, Sir Visvesvaraya Institute of Technology, Nashik University of Pune

<sup>2,3,4,5</sup>UG Students, Department of Electronics & Telecommunication, Sir Visvesvaraya Institute of Technology, Nashik University of Pune

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### ABSTRACT

This paper delves into the integration of VHDL (VHSIC Hardware Description Language) in the design and development of advanced home automation systems. VHDL, primarily recognized for its pivotal role in digital circuit design and simulation, offers precision, modularity, and reusability, making it a prime choice for intricate home automation applications. We explore the benefits of employing VHDL in creating responsive and reliable automation systems, emphasizing its capability to simulate complex scenarios before physical implementation. Through real-world case studies, we demonstrate VHDL's contribution to enhancing system efficiency, reducing energy consumption, and improving user experience in home automation setups. This study underscores VHDL's potential in revolutionizing the next generation of smart home solutions and offers insights for future research in the domain. Here, we present the design and implementation of home automation system. The design is described using VHDL and implemented using hardware using FPGA (Field Programmable Gate Array).

**Keywords:** FPGA, VHDL, Bluetooth, Home Automation System, Sensors.

### INTRODUCTION

The ever-evolving domain of home automation has witnessed significant technological advancements over the past few decades. As homes become smarter, there's an increasing demand for systems that are not only intelligent but also reliable, energy-efficient, and highly responsive. This transition has prompted researchers and developers to seek innovative methodologies and tools that can address the challenges of designing sophisticated home automation systems. Enter VHDL – the VHSIC (Very High-Speed Integrated Circuit) Hardware Description Language. Originally conceived for the defence sector to model, describe, and simulate digital systems, VHDL has transcended its primary use to become an essential tool in various civilian applications, including home automation. Its descriptive nature, combined with rigorous simulation capabilities, has positioned VHDL as an invaluable asset for designers aiming to create complex digital systems for smart homes.

This paper aims to explore the marriage between VHDL and home automation. We'll traverse the journey of how VHDL aids in the meticulous design and simulation of digital components, ensuring that automation systems are not only functional but also optimized for performance. Through this exploration, we aim to shed light on VHDL's transformative potential in the realm of home automation, offering insights into its benefits, applications, and prospects.

### Objective

The objective of home automation using VHDL (Very High-Speed Integrated Circuit Hardware Description Language) is to design and implement digital systems that can control and monitor various devices within a home environment. VHDL is commonly used for hardware description and synthesis, making it suitable for designing programmable logic devices like FPGAs (Field-Programmable Gate Arrays) used in home automation.

### LITERATURE REVIEW

- The system is designed using FPGA controller at the core to provide intelligent home solutions. The controller and a mobile device are connected through GSM network to allow monitoring and controlling of the devices.[1][1]
- This paper consists of a Verilog code that activates security and then comfort module. The moment owner arrives at home, he enters a password to get inside the home and home automation module gets activated. Security module gets activated as soon as right password is entered.[2][1]
- The devices connected to the FPGA are the dc motor, stepper motor and a led. The design has been described using Verilog and implemented in hardware using FPGA (Field Programmable Gate Array). system uses sensors for controlling home appliances.[3][1]
- The prime objective of the project is designing a home automation system using IOT that is capable of providing home automation based services using controlling devices according to the requirement of the user.



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Trupti K. Wable

Assistant Prof, Sir Visvesvaraya Institute of Technology, Nashik University of Pune

### TITLE OF PAPER

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The Patent Office Journal No. 31/2023 Dated 04/08/2023

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(19) INDIA

(22) Date of filing of Application :17/06/2023

(43) Publication Date : 04/08/2023

(54) Title of the invention : Implementation of AIoT as Cloud-Edge Collaborative system for Video Surveillance using Raspberry pi

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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

(71)Name of Applicant :

1)Ms. Trupti K. Wable

Address of Applicant :Department of Electronics & Communication, Dr. A. P. J. Abdul Kalam University, Indore Indore

2)Dr. Santosh Pawar

3)Dr. Rahul Mishra

Name of Applicant : NA

Address of Applicant : NA

(72)Name of Inventor :

1)Ms. Trupti K. Wable

Address of Applicant :Department of Electronics & Communication, Dr. A. P. J. Abdul Kalam University, Indore Indore

2)Dr. Santosh Pawar

Address of Applicant :Professor, Department of Electronics & Communication Engineering, Dr. A. P. J. Abdul Kalam University, Indore Indore

3)Dr. Rahul Mishra

Address of Applicant :Department of Electronics & Communication Engineering, Dr. A. P. J. Abdul Kalam University, Indore Indore

(57) Abstract :

This Invention Implementation of AIoT as Cloud-Edge Collaborative system for Video Surveillance using Raspberry pi introduces a cloud-edge collaborative system for video surveillance using Artificial Intelligence (AI) of Things (AIoT) and Raspberry pi. This system consists of a network of Raspberry pi boards operating distributed AI algorithms for processing real-time video stream, and a cloud computing backbone for video storage and analysis. A local neural network is used for object detection and classification on the Raspberry pi module, and the cloud computing services is employed for more complex tasks such as video analytics, facial recognition and anomaly detection. The proposed system is designed to provide a cost-effective solution for video surveillance, while simultaneously offering enhanced security and scalability. It is expected that such a cloud-edge collaborative system can enable effective real-time surveillance with minimal system latency and energy usage.

No. of Pages : 8 No. of Claims : 6



# 2<sup>nd</sup> International Conference on Innovative Trends in Engineering and Technology



## CERTIFICATE OF ACHIEVEMENT

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ISBN: 978-93-91535-73-5

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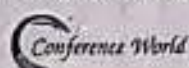
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# Design and Implementation of Collaborative Cloud-Edge System Using Raspberry Pi for Video Surveillance System with AIoT to Analyze Effective Performance Parameters of Network

Trupti Kaushiram Wable<sup>1</sup>

<sup>1</sup>Assistant Professor, Department of Electronics & Telecommunication, SVIT, Nashik, India

[trupti.wable@pravara.in](mailto:trupti.wable@pravara.in)

**Abstract** - The video surveillance can avoid many crimes as well as it will help to reduce crime rate in society as well we can save many lives. But currently implemented IoT system having various limitations like insufficient storage capacity and inadequate processing of information. Thus we can integrate traditional IoT system with Artificial Intelligence (AI) models to improve storage capacity & processing called as Artificial Intelligence of Things (AIoT). This system mainly focuses on performance parameter of video surveillance system the parameter consist of Response Latency Time, Network Bandwidth & Storage on server. In proposed system divided in two part, First part include Edge node implemented with Raspberry Pi as IoT system which having video input then it perform image processing & store output on edge node, second part include cloud node which is train with AI model as AI system to extract image and analyzed performance of system. So Cloud-Edge Collaborative system refers as Artificial Intelligence of Things (AIoT). In this research I conclude comparative study of traditional Cloud Computing System with Collaborative Cloud-Edge Computing system which shows that, the Response Latency Time improve by 5 times, Network Bandwidth improve by 10 times and storage capacity improve by 5 times of traditional Edge Computing System.

**Keywords:** Cloud-Edge collaboration, Cloud Computing, Edge Computing, Artificial Intelligence, Internet of Things.

## 1. INTRODUCTION

AIoT (Artificial Intelligence of Things) is a cloud-edge collaborative system that enables video surveillance using Raspberry pi. AIoT uses distributed computing technology to process data from multiple sources at the edge, such as cameras, ultrasound rangefinders, and object recognition systems. The data is then sent to cloud for further processing and storage. At the cloud, AI-driven analytics is applied for insights. The insights are used to take informed decisions for better video surveillance. Raspberry pi is used as the edge device in the AIoT system. It is equipped with sensors such as camera, ultrasonic range sensor and object recognition system, which collect data from the environment. The collected data is then sent to the cloud for further processing and analytics. At the cloud, the data is analysed with the help of AI-driven analytics. It is used to take informed decisions for better video surveillance. For example, the data obtained from the sensor can be used to identify





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