5.7.3 DEVELOPMENT ACTIVITIES

The CSE Department at Sri Venkateshwaraa College of Engineering & Technology actively engages in various development activities to enhance the academic, professional, and infrastructural growth of the department. These initiatives aim to improve faculty expertise, student skill development, industry collaborations, and research contributions, ensuring a holistic learning environment.

1.Product Development:

➢ Software product Development.

- To provide the guidance to the students and Faculty to carry out their projects and product development.
- Encouraging students and Faculty to develop their ideas into innovative products.
- The ERP Projects are developed by the faculty members and students of CSE Department.
- EDUconnect App - A Data Management App for educational institutions.
- Focuses on streamlining Student Records, Attendance, and Exam results.

2.Project Laboratories:

- The aim of Project Laboratories is to promote the research activities for faculties and students as well as to provide the platform for sharing and implementing ideas.
- By means of that faculty and students will nourish their research and development activities specifically providing opportunities for the students and Faculty to participate in project contest.
- Also, it provides opportunities to publish their research work in journals and conferences.

3.Entrepreneurs Development Bootcamp:

- Students and Faculty attend Bootcamps to develop entrepreneurial skills.
- **Startup Initiative – Pudhuvai Startup Sprint**
- Faculty and Students participating in the AIC-PECF'S - 3 Days Student Entrepreneurs Development Program Bootcamp (SIMPLIFI) under the flagship program Puduvai Startup Sprint.
- Covered topics like Design Thinking, Lean Canvas, and Business Pitching.
- The Institutions Innovation Council (IIC) is collaborated with Atal Incubation Centre Pondicherry Engineering College Foundation (AIC-PECF) to organize an Orientation Session on "Pudhuvai StartUp Sprint- An Entrepreneurial Initiative"
- Encouraging Faculty and students to pitch startup ideas for self-employment.

Students participating in the AIC-PECF'S 3 Days Student Entrepreneurs Development Program Bootcamp (SIMPLIFi) under the flagship program Puduvai Startup Sprint -Day 1

Day 2

Students participating in the AIC-PECF'S 3 Days Student Entrepreneurs Development Program Bootcamp (SIMPLIFi) under the flagship program Puduvai Startup Sprint -Day 2

Day 3:

Students participating in the AIC-PECF'S 3 Days Student Entrepreneurs Development Program Bootcamp (SIMPLIFi) under the flagship program Puduvai Startup Sprint -Day 3

Endowment Orientation Session on "Pudhuvai Startup Sprint -An Entrepreneurial Initiative

Photos of the Endowment Orientation Session on "Pudhuvai Startup Sprint -An Entrepreneurial Initiative" on 21-03-2023

4.Instructional Materials:

- Faculty members prepared the Video Lectures PPTs , Notes and Lab Mannual that a faculty may use in teaching-learning process to help in achieving the desired learning objectives.

➢ Learning Materials.

- Faculty members prepared lecture notes,2-mark questions and 11-mark questions for all units and give it to the students.

5. Faculty Development Activities

- To motivate and encourage the students and faculty members to do their research work and create products in various domain.

- Faculty members are published Research papers in referred SCI journals , Patent and Book Chapters in Artificial Intelligence and Deep Learning.

1. **Balaji Natarajan**, Mohammad. S. Obaidat, BalqiesSadoun, Rajesh Manoharan, Sitharthan Ramachandran and NadagogpalVelusamy, "New Clustering-Based Semantic Service Selection and User Preferential Model," in IEEE Systems Journal, Date of Publication 12 October – 2020. vol. 15, no. 4, pp. 4980-4988, Dec. 2021, doi: 10.1109/JSYST.2020.3025407.Impact Factor:4.4. Indexed in SCI& Scopus.

 [Cited-53]. https://ieeexplore.ieee.org/document/9220777

2. S.V.Aswinkumer, Lakshmi BharathGogu, E. Mohan, Suman Maloji, **Balaji Natarajan**, G. Sambasivam, and VaibhavBhushan Tyagi, "Track and Noise Separation Based on the Universal Codebook and Enhanced Speech Recognition Using Hybrid Deep Learning Method"in IEEE Access. vol. 11, pp. 120707 - 120720, 2023, doi: 10.1109/ACCESS.2023.3328208.Impact Factor: 3.9. Indexed in SCIE & Scopus. https://ieeexplore.ieee.org/document/10298228

3. S.V.Aswinkumer, N.Prabakaran, E. Mohan, **Balaji Natarajan**, G. Sambasivam, and VaibhavBhushan Tyagi, "Enhancing Cloud Task Scheduling With a Robust Security Approach and Optimized Hybrid POA"in IEEE Access. vol. 11, pp. 122426 - 122445, 2023, doi: 10.1109/ACCESS.2023.3329052.Impact Factor: 3.9. Indexed in SCIE & Scopus. https://ieeexplore.ieee.org/document/10304139

4. L.Manjunath, N.Prabakaran, S.V.Aswinkumer,E. Mohan, **Balaji Natarajan**, G. Sambasivam, G.PrabhuKanna and Vaibhav Bhushan Tyagi, "QoS Aware Integrated Management Technique for 5G mmWave-Based Hetnets", in IEEE Access. vol. 11, pp. 103394 - 103405, 2023, doi: 10.1109/ACCESS.2023.3318480.Impact Factor: 3.9. Indexed in SCIE & Scopus. https://ieeexplore.ieee.org/document/10261172

5. E. Mohan, P. Saravanan, **Balaji Natarajan**, S.V.Aswinkumer, G. Sambasivam, G.PrabhuKanna and Vaibhav Bhushan Tyagi, "Thyroid Detection and Classification Using DNN Based on Hybrid Meta-Heuristic and LSTM Technique," in IEEE Access. vol. 11, pp. 68217-68138, 2023, doi: 10.1109/ACCESS.2023.3289511.Impact Factor: 3.9. Indexed in SCIE & Scopus. https://ieeexplore.ieee.org/document/10163762

6. S. EzhilPradha, **A. Moshika, Balaji Natarajan, K. Andal**, G. Sambasivam and M.Shanmugam, "Scheduled Access Strategy for Improving Sensor Node Battery Life Time and Delay Analysis of Wireless Body Area Network,"in IEEE Access. vol. 10, pp. 3459-3468, 2022, doi: 10.1109/ACCESS.2021.3139663.Impact Factor: 3.9 Indexed in SCIE& Scopus. [Cited-1] https://ieeexplore.ieee.org/document/9666894

9.**A. Moshika**, M. Thirumaran, **Balaji Natarajan, K**. **Andal, G**. Sambasivam and R. Manoharan, "Vulnerability Assessment in Heterogeneous Web Environment Using Probabilistic Arithmetic Automata," in IEEE Access,vol. 9, pp. 74659-74673, 2021, doi: 10.1109/ACCESS.2021.3081567.Impact Factor: 3.9. Indexed in SCIE & Scopus. [Cited-2]. https://ieeexplore.ieee.org/document/9433582

RESEARCH ARTICLE

Thyroid Detection and Classification Using DNN Based on Hybrid Meta-Heuristic and LSTM Technique

E. MOHAN[1], P. SARAVANAN[2], BALAJI NATARAJAN[3], S. V. ASWIN KUMAR[4], G. SAMBASIVAM[5], (Member, IEEE), G. PRABU KANNA[6], AND VAIBHAV BHUSHAN TYAGI[7]

[1]Department of ECE, Saveetha School of Engineering, SIMATS, Chennai, Tamil Nadu 602105, India
[2]Department of Computing Technologies, School of Computing, SRM Institute of Science and Technology, Kattankulathur, Chennai, Tamil Nadu 603203, India
[3]Department of Computer Science and Engineering, Sri Venkateshwaraa College of Engineering and Technology, Ariyur, Puducherry 605102, India
[4]Department of Electronics and Communication Engineering, Koneru Lakshmaiah Education Foundation, Vaddeswaram, Andhra Pradesh 522302, India
[5]School of Computing and Data Science, Xiamen University Malaysia, Sepang, Selangor 43900, Malaysia
[6]School of Computing Science and Engineering, VIT Bhopal University, Kothri Kalan, Sehore, Madhya Pradesh 466114, India
[7]Faculty of Engineering, ISBAT University, Kampala, Uganda

Corresponding author: Vaibhav Bhushan Tyagi (tyagi.fict@isbatuniversity.com)

ABSTRACT In the field of medical research, prediction, as well as diagnosis of thyroid disease, is a major cause that is a challenging onset axiom. In metabolism regulation, thyroid hormone secretions play a significant role. Two frequent thyroid diseases are hypothyroidism and hyperthyroidism that release the hormones like the thyroid, which regulate the body's metabolism rate. For analytics, the approach of data cleansing is utilized to analyze enough primitive data, which demonstrates the patients' risk. Deep Neural Networks (DNN) is the most vital as well as efficient technology, which predict the disorder of thyroid. To avoid the errors of human, the evaluation of manual process consumes expertise domain as well as time. To detect disease, a novel Long Short-Term Memory based Convolution Neural Network (LSTM-CNN) is utilized with occurrence area Vgg-19. For selecting the feature, the approach of bias field correction is integrated with the hybrid optimization technique i.e., Black Widow Optimization as well as Mayfly Optimization Approach (HBWO-MOA), also for classifying the disease the LSTM as well as Vgg-19 of Deep Learning (DL) is presented. From DDTI dataset image of ultrasound, the disease of thyroid prediction as well as classification is efficiency. This analysis shown that the proposed technology is accurate than the convolutional methodology. When compared to existing prediction techniques i.e., AlexNet-LSTM, ResNet-LSTM, Vgg16-LSTM, the proposed approach of Vgg-19-LSTM's precision, sensitivity, accuracy, recalls as well as F1_score is effective.

INDEX TERMS Classification, HMOA-BWO, LSTM, pre-processing, segmentation, Vgg-19.

I. INTRODUCTION

In the industry of healthcare, computational biology advances are being utilized for storing the collection of patient's data, which predict the medical diseases. A variety of techniques are accessible for early disease diagnosis. For analyzing the disease, the intelligent applications i.e., the information of medical technology are not accessible to collect the required sets of data [1], [2]. However, in recent days there is a

The associate editor coordinating the review of this manuscript and approving it for publication was Sangsoon Lim.

technology named as Machine Learning (ML) optimization, which plays a vital contribution for predicting &solving non-linear as well as complex issues. The features that can be chosen in any approach of disease detection, which classify easily in healthy persons, are emphasized as much as possible from multiple datasets. Instead, a healthy person may be exposed to unnecessary treatment because of misidentification. As a result, the accuracy of prediction any diseases along with thyroid is highest concern [3], [4], [5], [6].

In the neck, an endocrine gland is also known as the thyroid gland. It grows beneath the Adam's apple in the lower

RESEARCH ARTICLE

Track and Noise Separation Based on the Universal Codebook and Enhanced Speech Recognition Using Hybrid Deep Learning Method

S. V. ASWIN KUMER[1], LAKSHMI BHARATH GOGU[1], E. MOHAN[2], SUMAN MALOJI[1], BALAJI NATARAJAN[3], G. SAMBASIVAM[4], (Member, IEEE), AND VAIBHAV BHUSHAN TYAGI[5]

[1]Department of Electronics and Communication Engineering, Koneru Lakshmaiah Education Foundation, Vaddeswaram, Andhra Pradesh 522302, India
[2]Department of ECE, Saveetha School of Engineering, SIMATS, Chennai, Tamil Nadu 602105, India
[3]Department of Computer Science and Engineering, Sri Venkateshwaraa College of Engineering and Technology, Ariyur, Puducherry 605102, India
[4]School of Computing and Data Science, Xiamen University Malaysia, Sepang, Selangor 43900, Malaysia
[5]Faculty of Engineering, ISBAT University, Kampala, Uganda

Corresponding author: Vaibhav Bhushan Tyagi (tyagi.fiet@isbatuniversity.com)

ABSTRACT The concept of Deep learning is a part of machine learning which is very useful nowadays to achieve accurate voice and speech recognition based on the training data by creating robust algorithms. It is also possible to separate the noise from original speech as well as the separation of tracks in particular audio signal with the help of machine learning algorithms. In this paper, the implementation is applicable for voice assistant to separate the tracks and the noises from the multiple original audio which reproduces simultaneously using the speech enhancement and universal code book. For that, the Hybrid Deep Learning Algorithm has been developed and the training data sets are also created and achieve the accuracy in the speech recognition for the variety of voice assistants. Most of the time, the voice assistant recognizes the voice with noises and musical audio which results in the malfunction of devices which can be controlled by the same voice assistant. The Generative adversarial networks from Deep learning and the blind source separation method from multi-channel model are combined to form this proposed hybrid deep learning model.

INDEX TERMS Blind source separation (BSS) method, deep learning method, generative adversarial networks (GAN), multi-channel method, noise separation, speech recognition, speech enhancement, track separation, voice assistant.

I. INTRODUCTION

The usage of voice assistant in recent trends and technology has become severe nowadays to control the appliances of all types like home appliances, industrial appliances and machines, automated vehicles, smart phones, and other related applications. In that, the major input for that voice assistant is the human voice to control and operate all the terminal nodes. If the input collapses or adds noises, then the voice assistant starts malfunctioning, based on the corrupted inputs. To reduce this effect in the input side, the Hybrid Deep Learning Algorithm has been proposed and the training data sets are also created and tested to achieve accuracy in the speech recognition for the variety of voice assistants. The track separation process is not an easy task if the unwanted information which is also called as interfering source which is like the actual original payload information which is also called as target source. Here, the interfering sources are more and there is only one target source. First, the unwanted tracks should be found out and it must be separated by using the Hybrid Deep Learning Algorithm. Speech separation is a fundamental problem in audio processing, with applications ranging from improving audio quality in communication systems to enhancing speech recognition in noisy environments.

The associate editor coordinating the review of this manuscript and approving it for publication was Yilun Shang.

RESEARCH ARTICLE

QoS Aware Integrated Management Technique for 5G mmWave-Based Hetnets

L. MANJUNATH[1,2], N. PRABAKARAN[1], S. V. ASWIN KUMAR[1], E. MOHAN[3],
BALAJI NATARAJAN[4], G. SAMBASIVAM[5], (Member, IEEE),
AND VAIBHAV BHUSHAN TYAGI[6]

[1]Department of Electronics and Communication Engineering, Koneru Lakshmaiah Education Foundation, Vaddeswaram, Andhra Pradesh 522302, India
[2]Department of ECE, CVR College of Engineering, Hyderabad, Telangana 501510, India
[3]Department of ECE, Saveetha School of Engineering, SIMATS, Chennai, Tamil Nadu 602105, India
[4]Department of Computer Science and Engineering, Sri Venkateswara College of Engineering and Technology, Ariyur, Pondicherry 605102, India
[5]School of Computing and Data Science, Xiamen University Malaysia, Sepang 43900, Malaysia
[6]Faculty of Engineering, ISBAT University, Kampala, Uganda

Corresponding author: Vaibhav Bhushan Tyagi (tyagi.fict@isbatuniversity.com)

ABSTRACT One of the important ultimatums in enhancing the fifth generation (5G) network's capacity is the performance limit due to spectrum occupancy. The mmWave technology overlay on 5G heterogeneous network (HetNet) and caching the contents are proposed as the solutions to this problem. By reducing the backhaul links occupancy, increasing the access link utilization and caching, the impact of spectrum occupancy problem can be minimized. In our earlier work, differential Quality of Service (QoS) was provisioned by managing the cache and backhaul resources using machine learning techniques. In this work, an integrated solution combining content, cache and user management is proposed to maximize network utilization and QoS. The problem of effective utilization of the network at the same time ensuring the QoS for users are solved as a multi objective optimization problem with the aid of hybrid meta heuristics with complementary exploration and exploitation capability. The user association to base station is made adaptive to load and cache hit ratio at the base station. By increasing the content proximity to the users, the load of backhaul links is minimized. Through these integrated management strategies, the proposed solution is able to provide higher QoS compared to existing works in terms of reduction in packet drop by 6%, reduction in delay by 39%, increase in network throughput by 8% and a consistent cache hit ratio more than 85%.

INDEX TERMS MmWave backhaul, hetnet, caching, multi criteria optimization, hybrid meta-heuristics.

I. INTRODUCTION

Smartphone revolution and Internet of Things (IoT) have created unprecedented demand for mobile data traffic. The data traffic is increasing exponentially [1] and traditional cellular networks are no longer able to solve the unprecedented demand and service quality disruptions due to outbreak of mobile data services. Fifth generation (5G) mobile communication systems are designed to address these challenges in rapid outbreak of mobile data services [2]. 5G networks amalgamate various solutions like mmWave, massive Multiple input Multiple output (MIMO) and Heterogeneous networks (Hetnets) to intensify the network capacity [3]. But these techniques are based on co-existence of backhaul between base station (BS) and core network. The effectiveness of these techniques depends on how well the traffic on backhaul links are managed. The traffic on backhaul links must be reduced and congestion bottleneck must be avoided without degrading the quality of service for users [4]. The effectiveness of techniques to improve the utilization of 5G networks is measured in terms of average potential throughput (APT) [5]. The spectrum resources shared between access and backhauling influences the APT. Various studies have pointed out the influence of backhaul links utilization over APT ([6], [7]). Reducing the backhaul link congestion increases the

The associate editor coordinating the review of this manuscript and approving it for publication was Yogendra Kumar Prajapati.

RESEARCH ARTICLE

Enhancing Cloud Task Scheduling With a Robust Security Approach and Optimized Hybrid POA

S. V. ASWIN KUMER [1], **N. PRABAKARAN**[1], **E. MOHAN** [2], **BALAJI NATARAJAN** [3], **G. SAMBASIVAM** [4], **(Member, IEEE), AND VAIBHAV BHUSHAN TYAGI** [5]

[1] Department of Electronics and Communication Engineering, Koneru Lakshmaiah Education Foundation, Green Fields, Vaddeswaram, Andhra Pradesh 522302, India
[2] Department of ECE, Saveetha School of Engineering, SIMATS, Chennai, Tamil Nadu 602105, India
[3] Department of Computer Science and Engineering, Sri Venkateshwaraa College of Engineering and Technology, Ariyur, Puducherry 605102, India
[4] School of Computing and Data Science, Xiamen University Malaysia, Sepang, Selangor Darul Ehsan 43900, Malaysia
[5] Faculty of Engineering, ISBAT University, Kampala, Uganda

Corresponding author: Vaibhav Bhushan Tyagi (tyagi.fict@isbatuniversity.com)

ABSTRACT Dynamic and flexible computing resources are offered by cloud computing (CC), which has gained popularity as a computing technology. Efficient task scheduling (TS) plays a critical role in CC by optimizing the distribution of tasks across available resources to achieve maximum performance. The allocation of computational tasks in a cloud environment is a complicated process that is affected by multiple factors, such as available network bandwidth, make span, and cost considerations. Therefore, it is crucial to optimize available bandwidth for efficient TS in CC. In the present research, a novel pelican-based approach is introduced to optimize TS in the CC environment. The newly developed method also utilizes a security approach called Polymorphic Advanced Encryption Standard (P-AES) to encode cloud information during scheduling. The study evaluates the proposed algorithm's performance in terms of the make span, resource utilization, cost, response time, throughput, latency, execution time, speed, and bandwidth utilization. The simulation is carried out using the Python tool, and it effectively handles a wide range of tasks from 1000 to 5000. The proposed algorithm offers a new perspective on utilizing pelican algorithms to optimize task scheduling in CC. The hybrid optimization enables the proposed algorithm to provide efficient task scheduling by exploiting the strengths of entire algorithms. The proposed approach offers an innovative solution to the challenges of scheduling tasks in cloud environments and provides a more effective and secure way of optimizing cloud services. Overall, this study provides valuable insights into task scheduling optimization in CC and offers an effective approach for enhancing the performance of CC services.

INDEX TERMS Advanced encryption standard, chameleon swarm algorithm, cloud computing, hybrid model, security, moth swarm algorithm, task scheduling.

I. INTRODUCTION

In the domain of cloud computing (CC), a recent revolution has brought forth numerous advantages over traditional distributed computing. This multifunctional and highly efficient computing system leverages large-scale resources to ensure the effectiveness of cloud services [1], [2]. A fundamental aspect of CC is the process of scheduling and distributing tasks across various computing resources, which is vital for providing customized computing, information, and storage services to users [3], [4]. Efficient task scheduling is paramount for successful task execution within cloud environments, as it impacts performance and resource utilization. Therefore, optimizing task scheduling mechanisms can significantly enhance the overall performance of CC services [5], [6]. Task scheduling involves allocating CC resources based on specific optimization objectives to achieve timely task completion within a cost-effective framework while

The associate editor coordinating the review of this manuscript and approving it for publication was Yogendra Kumar Prajapati.

IEEE Access

Scheduled Access Strategy for Improving Sensor Node Battery Life Time and Delay Analysis of Wireless Body Area Network

S. EZHIL PRADHA[1], A. MOSHIKA[2], BALAJI NATARAJAN[2], K. ANDAL[2],
G. SAMBASIVAM[3], (Member, IEEE), AND M. SHANMUGAM[4]

[1]Department of Computer Science and Engineering, Pondicherry Engineering College, Pondicherry 605014, India
[2]Department of Computer Science and Engineering, Sri Venkateshwaraa College of Engineering and Technology, Pondicherry 605102, India
[3]Faculty of Information and Communication Technology, ISBAT University, Kampala, Uganda
[4]Department of Computer Science and Engineering, Vignan's Foundation for Science, Technology & Research, Guntur, Andhra Pradesh 522213, India

Corresponding author: G. Sambasivam (gsambu@gmail.com)

ABSTRACT In WBAN, energy efficiency is a major concern. The sensor nodes attached to the human body are battery-powered devices with a finite lifespan. These sensor nodes assist in gathering biological data from the human body and transmitting it to a control device. In WBAN, the MAC protocol is critical in evaluating a protocol's energy efficiency. Traditional MAC protocols aim to boost throughput and bandwidth efficiency. The most critical aspect is that they lack in energy conserving mechanism. By employing correct control techniques that aid in the efficient use of energy resources, the useful network life time can be extended. Several MAC protocols for WBAN have been devised to reduce energy consumption, and packet collision, idle listening, overhearing, and control packet overhead are the main causes of energy waste in wireless networks. Idle listening, packet overhead, overhearing, and collision rate are all addressed by the energy-saving technique. In WBAN, we introduced a novel energy-efficient MAC protocol called Scheduled Access MAC (SAMAC) to extend the network life time without sacrificing QoS. Using the Castalia simulator, we analyze and compare the performance of our proposed SAMAC to that of the BaselineMAC (IEEE 802.15.6) and ZigBeeMAC (IEEE 802.15.4) in terms of energy consumption, packet delivery ratio, and end-to-end delay. In terms of both energy conversion and WBAN Quality of Service, our simulation results suggest that our proposed SAMAC is more efficient than Baseline MAC and ZigBeeMAC.

I. INTRODUCTION

With the rapid development in the wireless technology, the Wireless Body Area Network (WBAN) has a great impact in health care patient monitoring applications [1]. The WBAN comprised of medical sensor nodes which operates autonomously and these sensor nodes measures the physiological parameters of the human body like heartbeat, temperature, glucose level, blood pressure etc. The basic components of WBAN are personnel device, Actuator and sensor nodes. The personnel device acts as a gateway for the sensor nodes which collects the information from the sensor nodes and transmit that information to the doctor's database via access point. Based on the information gathered from the human body the doctor will take a corrective action to the patient. The applications of WBAN are huge in many fields.

The WBAN [2] supports low-cost and spontaneous health monitoring with real-time updates of medical records for patients, fire fighters, military personnel through the Internet with the help of sensors. Health monitoringsignals can be detected from patients and sent to receivers via wireless mode and then communicated to the remote locations so that they can be analyzed and required measures can be taken at right time. It covers three major areas for a complete transfer of signal. The communication architecture in the WBAN is divided into three tier as mentioned in figure 1.

A. TIER-1: INTRA-WBAN COMMUNICATION
In this level, the interaction of the sensors is confined around the body of the patient. The communication signals within

The associate editor coordinating the review of this manuscript and approving it for publication was Giovanni Pau.

Patent publications :

1. Title of the Invention: AN ARTIFICIAL INTELLIGENCE BASED SECURITY ROBOT.Application No: 202341052249 A, Date of Filing of Application: 03.08.2023, Publication Date:01.09.2023 No. of Pages: 20, No of Claims: 7. The Patent Office Journal No. 35/2023 Dated 01/09/2023. Page No: 57700. https://search.ipindia.gov.in/IPOJournal/Journal/Patent

2. Title of the Invention: ROBOTIC BASED TECHNOLOGY TO MANAGE AND MONITOR THE WATER POLLUTION CAUSED TO RIVERS. Application No: 202241060826 A, Date of Filing of Application: 25.10.2022, Publication Date: 14.11.2022. No. of Pages: 14, No of Claims: 6. The Patent Office Journal No. 44/2022 Dated 04/11/2022. Page No: 70070. https://search.ipindia.gov.in/IPOJournal/Journal/Patent

3. **Dr.K.,Andal, Mrs.Nagamany Abirami, Ms.S.Pavithra, Ms.S.Vinitha**, "ROBOTIC HOSPITAL MONITORING DEVICE", Design No: 433406-001, dated on 10/10/2024.

(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :25/10/2022

(21) Application No.202241060826 A

(43) Publication Date : 04/11/2022

(54) Title of the invention : ROBOTIC BASED TECHNOLOGY TO MANAGE AND MONITOR THE WATER POLLUTION CAUSED TO RIVERS

(51) International classification :G01N0033180000, F03B0017060000, G06K0009620000, G06F0003010000, H01C0007102000	(71)Name of Applicant : 1)P. DHARANYADEVI Address of Applicant :ASSISTANT PROFESSOR (CONTRACTUAL), CSE, PUDUCHERRY TECHNOLOGICAL UNIVERSITY, PUDUCHERRY, INDIA, 605014 PUDUCHERRY ---------- ---------- 2)Dr.B.SENTHILNAYAKI 3)Dr. D. PALANI 4)JANARDHAN NAULEGARI 5)Dr.M.ANOUSOUYA DEVI 6)BALAJI NATARAJAN 7)MADARAPU NARESH KUMAR 8)C RAJESWARY 9)VIJAYA KUMAR B 10)K. VENKATALAKSHMI Name of Applicant : NA Address of Applicant : NA (72)Name of Inventor : 1)P. DHARANYADEVI Address of Applicant :ASSISTANT PROFESSOR (CONTRACTUAL), CSE, PUDUCHERRY TECHNOLOGICAL UNIVERSITY, PUDUCHERRY, INDIA, 605014 PUDUCHERRY ---------- ---------- 2)Dr.B.SENTHILNAYAKI Address of Applicant :TEACHING FELLOW, DEPARTMENT OF INFORMATION SCIENCE AND TECHNOLOGY, COLLEGE OF ENGINEERING, ANNA UNIVERSITY,CHENNAI, 600025 CHENNAI ---------- ---------- 3)Dr. D. PALANI Address of Applicant :ASSISTANT PROFESSOR/ECE, UNIVERSITY COLLEGE OF ENGINEERING VILLUPURAM, VILLUPURAM, 605103 VILLUPURAM ---------- -------- 4)JANARDHAN NAULEGARI Address of Applicant :RESEARCH SCHOLAR, DEPARTMENT OF COMPUTER SCIENCE, SCHOOL OF MATHEMATICS AND COMPUTER SCIENCES, CENTRAL UNIVERSITY OF TAMIL NADU TIRUVARUR ---------- -------- 5)Dr.M.ANOUSOUYA DEVI Address of Applicant :ASSISTANT PROFESSOR DEPARTMENT OF INFORMATION TECHNOLOGY SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE MADAGADIPET PONDICHERRY 605107 PUDUCHERRY ---------- -------- 6)BALAJI NATARAJAN Address of Applicant :PROFESSOR & HEAD, CSE, SRI VENKATESHWARAA COLLEGE OF ENGINEERING AND TECHNOLOGY, ARIYUR, PUDUCHERRY-605102 PUDUCHERRY ---------- ---------- 7)MADARAPU NARESH KUMAR Address of Applicant :SCIENTIST - B, NATIONAL INFORMATICS CENTRE, MINISTRY OF ELECTRONICS AND INFORMATION TECHNOLOGY, NEW DELHI, 110003 NEW DELHI ---------- ---------- 8)C RAJESWARY Address of Applicant :RESEARCH SCHOLAR/CSE, PUDUCHERRY TECHNOLOGICAL UNIVERSITY, PUDUCHERRY 605014 PUDUCHERRY ---------- ---------- 9)VIJAYA KUMAR B Address of Applicant :ASSISTANT PROFESSOR/INFORMATION TECHNOLOGY, SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE, MADAGADIPET,605107 PUDUCHERRY ---------- ---------- 10)K. VENKATALAKSHMI Address of Applicant :ASSISTANT PROFESSOR, ECE, UNIVERSITY COLLEGE OF ENGINEERING TINDIVANAM, TINDIVANAM, INDIA, 604 001 TINDIVANAM ---- ----------
(86) International Application No PCT// 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 :
Robotic based technology to manage and monitor the water pollution caused to rivers is the proposed invention. The invention aims at implementing robotic aspects to monitor the water pollution that will be caused to rivers. This is achieved using image recognition techniques which will intimate the robotic unit in cases of persons throwing bins into water. Continuous monitoring of river beds and backwater of river is the intention of the proposed invention.

No. of Pages : 14 No. of Claims : 6

(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :03/08/2023

(21) Application No.202341052249 A

(43) Publication Date : 01/09/2023

(54) Title of the invention : AN ARTIFICIAL INTELLIGENCE BASED SECURITY ROBOT

(71)Name of Applicant :
1)Dr. U. Padmavathi
Address of Applicant :Assistant Professor, Department of Computer Science & Engineering, Shiv Nadar University Chennai, Kalavakkam, Chennai ---------- ----------
2)Dr. K. Chokkanathan
3)Dr. Balaji Natarajan
4)Dr. Sujithra @ Kanmani
5)Dr. R. Sendhil
6)Mrs. K. Andal
7)Mrs. Yagnasri Ashwini
8)Mrs. A. Moshika
9)Mr. U. Sakthivelu
10)G .V .Vidya Lakshmi
Name of Applicant : NA
Address of Applicant : NA
(72)Name of Inventor :
1)Dr. U. Padmavathi
Address of Applicant :Assistant Professor, Department of Computer Science & Engineering, Shiv Nadar University Chennai, Kalavakkam, Chennai ---------- ----------
2)Dr. K. Chokkanathan
Address of Applicant :Associate Professor, Department of AI, Madanapalle Institute of Technology and Science, Madanapalle, Andhra Pradesh ---------- ----------
3)Dr. Balaji Natarajan
Address of Applicant :Professor & Head, Department of Computer Science & Engineering, Sri Venkateshwaraa College of Engineering & Technology, Ariyur, Puducherry – 605102, Puducherry, India ----------
4)Dr. Sujithra @ Kanmani
Address of Applicant :Assistant Professor, School of Computer Science & Engineering, VIT University Chennai Campus, Chennai 600127 ---------- ----------
5)Dr. R. Sendhil
Address of Applicant :Assistant Professor Sr. Grade, School of Computer Science & Engineering, VIT University Chennai Campus, Chennai 600127 ---------- ----------
6)Mrs. K. Andal
Address of Applicant :Assistant Professor, Department of Computer Science & Engineering, Sri Venkateshwaraa College of Engineering & Technology, Ariyur, Puducherry – 605102, Puducherry, India ----------
7)Mrs. Yagnasri Ashwini
Address of Applicant :Assistant Professor, Department of Computer Science & Engineering, Anurag University, Hyderabad ---------- ----------
8)Mrs. A. Moshika
Address of Applicant :Assistant Professor, Department of Computer Science & Engineering, Sri Venkateshwaraa College of Engineering & Technology, Ariyur, Puducherry – 605102, Puducherry, India ----------
9)Mr. U. Sakthivelu
Address of Applicant :Research Scholar, SRM Institute of Science & Technology, Kattankulathur, Chennai ----
10)G .V .Vidya Lakshmi
Address of Applicant :Research Scholar, School of Computer Science and Engineering, VIT-AP University, Amaravati, India-522237 ---------- ----------

(51) International classification : B25J0009160000, G06Q0010060000, B25J0013080000, B25J0009100000, B25J0019000000
(81) International Application No Filing Date : PCT// :01/01/1900
(87) International Publication No : NA
(61) Patent of Addition to Application Number Filing Date : NA : NA
(62) Divisional to Application Number Filing Date : NA : NA

(57) Abstract

Security robots patrol the road independently, recognizing outsiders and communicating with officers. The human behind the monitor screen has already regressed in time, and the robots have spotted the infraction. The only role of a security guard will be to physically deter a potential intruder. An industrial robot is one that is designed to automate labor-intensive manufacturing processes like those required by a constantly moving assembly line. An industrial robot's five major components are a controller, sensors, a robotic manipulator, an end-effector, and a drive. The robot controller is the brain of the robot. It is a computer device that instructs the robot on how to work using coded programmes. It is defined as a mechanical machine used to automate production-related processes in industrial environments. Security robots collect real-time information about the facility's surrounds and activities. It is equipped with a vision sensor, a laser radar, an ultrasonic sensor, a number of environmental sensors, a GPS unit, a walking mechanism, a wireless communication unit, and an acousto-optic reminding device. This data can then be analyzed to identify patterns, trends, and opportunities for the development of security protocols. Robots' expertise can be used to make intelligent and proactive security decisions for the organization. When a dangerous or emergency situation arises, a quick response is essential. Because of their mobility and real-time communication, security robots can alert human operators or activate relevant security procedures to minimize damage.

No. of Pages : 20 No. of Claims : 7

BOOK:
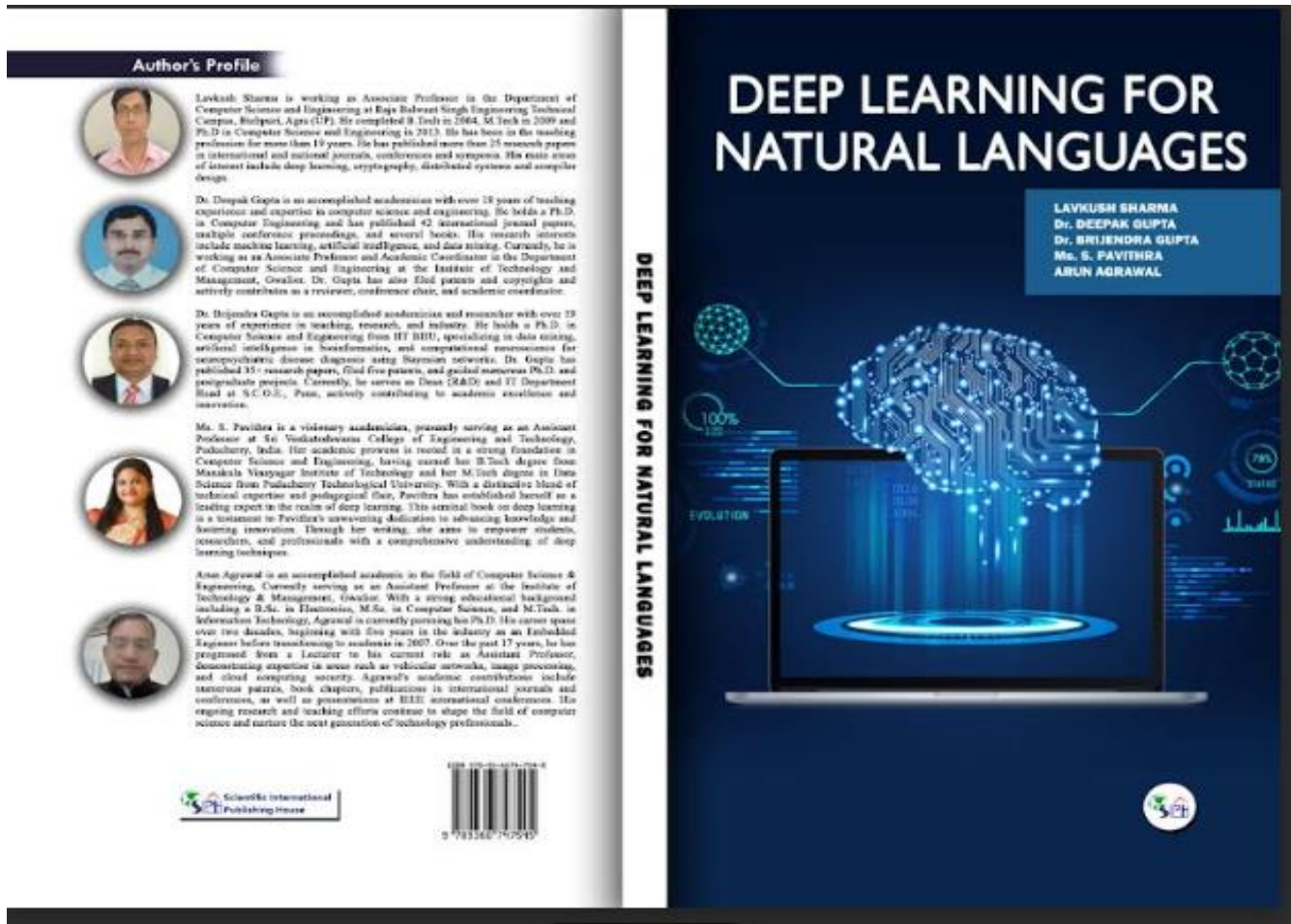
5. Skill Development Initiatives:

1.Technical Skill Enhancement Programs

- Encouraging students and Faculty to participate Boot camps, hands-on workshops, Smart India Hackathons.
- Faculty and students attended Hackathons in AI, Web Development, and Cybersecurity.
- Encouraging students and Faculty to complete online certification courses from platforms such as Infosys, ONEYES, Unicef, Eduskills, and MSME to enhance their skills and career prospects.
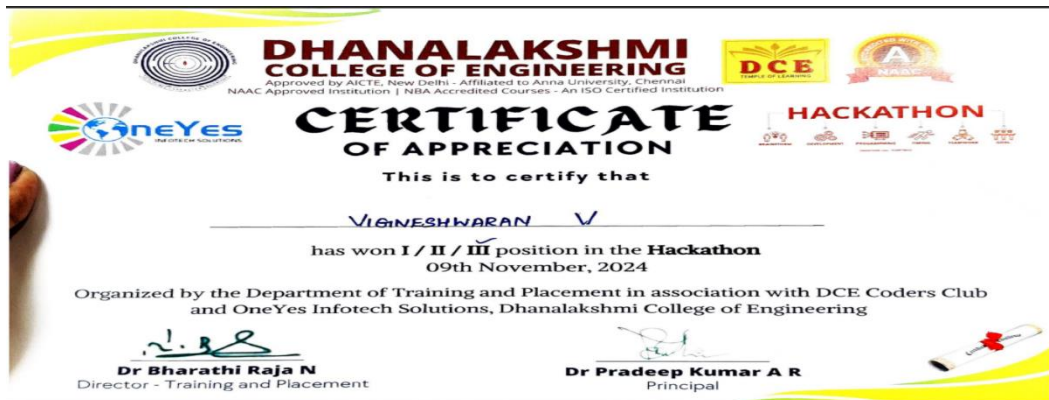
Boot Camp:

Smart India Hackathon:

- Allow students to attend Hackathons in AI, Web Development, and Cybersecurity.
- Encourage students to complete online certification courses from platforms such as Infosys, ONEYES,Unicef, Eduskills, and MSME to enhance their skills and career prospects.

EDUSKILLS

These development activities ensure that students and faculty are equipped

with the latest skills, industry exposure, and research capabilities, fostering academic

excellence and career success.