5.7.1 Academic Research in the CSE Department

The CSE Department at Sri Venkateshwaraa College of Engineering & Technology is committed to fostering academic research, innovation, and technological advancements. Faculty and students actively engage in research projects, publications, funded research, and industry collaborations, contributing to the advancement of computer science and engineering disciplines.

- 11 + 2 Number of quality publications in refereed/ SCI Journals and Books.

INTERNATIONAL JOURNALS

SCI & SCIE Indexed in Scopus

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

7.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

8.S. EzhilPradha, A. Moshika, Balaji Natarajan, **K. Andal**, G. Sambasivam and .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

10. 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

11. 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

IEEE Access

RESEARCH ARTICLE

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

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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

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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

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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.

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IEEE Access

RESEARCH ARTICLE

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

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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

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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

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RESEARCH ARTICLE

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

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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

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IEEE *Access*

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

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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.

INDEX TERMS Wireless body area network (WBAN), medium access control (MAC) layer, IEEE 802.15.6, scheduled access medium access control (SAMAC), energy efficiency, quality of service (QoS).

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

- **3 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

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(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
(86) International Application No :PCT// Filing Date :01/01/1900	
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(61) Patent of Addition to Application Number :NA Filing Date :NA	
(62) Divisional to Application Number :NA Filing Date :NA	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 ------- - ----------

(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

The Patent Office Journal No. 44/2022 Dated 04/11/2022

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(43) Publication Date : 01/09/2023

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

(51) International classification : B25J0009160000, G06Q0010060000, B25J0013080000, B25J0009100000, B25J0019000000	(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 ----------- ----------
6) 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
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

57700

- 1 Faculty awarded Ph.D. d during the assessment period while working in the institute.

Faculty name	Research Area	University	Ph.D awarded Year	Academic Year
Dr.K. ANDAL	Deep Learning	Anna University	2024	2024-2025

1. **Ph.D. Pursuing and Completions**

   o Four Faculty members are actively pursuing **Ph.D. research** in various fields such as **Data Security, IoT, Cyber security, and AI**.

Faculty Name	Research Topic	University	Supervisor	Date of Registration	Number of quality publications in referred/SCI journals,citations,books/book Chapters
Mrs.D.NAGAMANY ABIRAMI	Data Security in Cloud Computing	Pondicherry University	Dr.M.S.Anbarasi	02.02.2017	**07**
Ms.S.VINITHA	Internet of Things	Saveetha University	Dr.R.Rajasekar	08.05.2024	-
Mrs.L.SATHIYA	Cyber Security and Internet of Things	Saveetha University	Dr.Poonkavanam	27.06.2024	-
Mrs.V.SIVASANKARI	Artificial Intelligence	Puducherry Tehnological University	Dr.R.Kalpana	09.09.2024	-

   o Dr. K. Andal successfully completed a **Ph.D. in Deep Learning** at Anna University in 2024 and was promoted to **Associate Professor**.

Faculty name	Research Area	University	Ph.D awarded Year	Academic Year
Dr.K. ANDAL	Deep Learning	Anna University	2024	2024-2025

2. Research Focus Areas for Students

Faculty and students conduct research in cutting-edge domains, including:

- Artificial Intelligence
- Machine Learning
- Cyber security
- Block chain
- Cloud Computing
- Internet of Things (IoT)
- Deep Learning

3. Faculty & Student Research Publications

- Indexed Journal Publications

  - Faculties encouraging Students to published papers in IEEE, Scopus-indexed journals etc.
  - Encouraging Students to publish Papers on their respective projects regularly.

➢ International & National Conferences

- Faculty and students present papers at National and International conferences.

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4th International Conference on Artificial Intelligence, 5G Communications and Network Technologies (ICA5NT 2024)

21-03-2024 & 22-03-2024 (Hybrid Mode)

Proceedings

Organized by Department of Electronics and Communication Engineering & Department of Information Technology

Proceedings of 4th International Conference on Artificial Intelligence,5G Communications and Network Technologies (ICA5NT 2024)

Sign Language Translation

Kirthiversha.M, Devsri.S, Sowmiya.D, Arunthathi.S, Andal.K
Computer Science and Engineering, Sri Venkateshwaraa College of Engineering and Technology, Pondicherry University, Puducherry, India.
E-mail: kirthivershaofficial123@gmail.com, devsri1209@gmail.com, sowmiyadurai1724@gmail.com, arunthathisaravanan13@gmail.com, sanandal86@gmail.com.

Abstract: Communication between normal people and people with disabilities i.e. Deaf- Mute society is not easy in day-to-day life. The communication gap between both people is mainly due to a lack of understanding between them. To minimize the gap, our trained model is going to act as a Translator. In this paper, the proposed work demonstrates two functionalities of the translator (a) conversion of text into animated video and (b) production of text by capturing the sign language shown by the deaf-mute people. Therefore, the translator can be widely used among people for better communication without knowing their disabilities. So, in the analysis of Sign Language Recognition (SLR) techniques, for object detection YOLO V7 and recognition of visual letters using Convolutional Neural Network (CNN) and Faster Region-Convolutional Neural Network (Faster R-CNN) can achieve more than 95% in accuracy after the implementation of the proposed model.

Keywords: Sign Language, Deep Learning, Artificial Intelligence, Computer Vision

- Participation in workshops and technical symposiums.

➢ Book Publication and Patents

- Faculties published Books and Patents in their respective domains.

- ➢ Government & Industry Funded Research

  - • AICTE, PMKY and ATAL projects.

ATAL PROJECTS:

About Resource Person

Session 1 6:30 PM - 8:00 PM
Topic: Introduction to DevOps and Cloud Native Developments
Name of the Expert: Dr.N.Sivakumar
Designation & Organization: Professor /CSE, Puducherry Technological University
Years of Exp: 20

Session 2 8:00 PM - 9:30 PM
Topic: Introduction to Containers and Docker
Name of the Expert: Dr.S.Senthilkumar
Designation & Organization: Assistant Professor / CSE, UCE - BIT Anna University, Tiruchirapalli.
Years of Exp: 24

Session 3 6:00 PM - 7:30 PM
Topic: Container Orchestration with Kubernetes (with Hands-on)
Name of the Expert: Ravi Kulkarni
Designation & Organization: Devops Architect SSK Training & Consultant
Years of Exp: 12

Session 4 7:30 PM - 9:00 PM
Topic: Kubernetes Storage and Configurations
Name of the Expert: S.Milton Ganesh
Designation & Organization: AP / CSE, AnnaUniversity – Tindivanam
Years of Exp: 14

Session 5 6:00 PM - 7:30 PM
Topic: Building and Managing CI/CD Pipelines
Name of the Expert: Prabhakaran Ramadoss
Designation & Organization: Principal Software Engineer Cadence Design Systems
Years of Exp: 12

Session 6 7:30 PM - 9:00 PM
Topic: Kubernetes with Helm : Package Management
Name of the Expert: Ravi Kulkarni
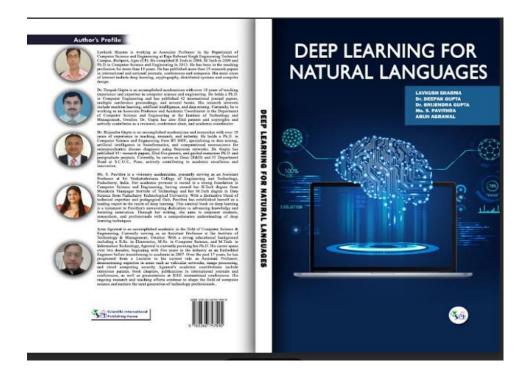Designation & Organization: Devops Architect SSK Training & Consultant
Years of Exp: 12

Session 7 6:00 PM - 7:30 PM
Topic: Monitoring, Logging and Observability
Name of the Expert: Arun Rajendran,
Designation & Organization: PMP, Head – Midis Group, UAE.
Years of Exp: 16

Session 8 7:30 PM - 9:00 PM
Topic: DevSecOps : Integrating Security in CI/CD (with Hands-on)
Name of the Expert: Dr.Elumalaivasan
Designation & Organization: Assistant Professor / Data Science and Business System,SRM - Katankulathur
Years of Exp: 15

Session 9 6:00 PM - 7:30 PM
Topic: DevOps : GitOps Managing Kubernetes with Git (with Hands-on)
Name of the Expert: Mr.Vimal Raj
Designation & Organization: Associate System Engineer, TCS
Years of Exp: 10 Years 11 Months

Session 10 7:30 PM - 9:00 PM
Topic: DevSecOps:Integrating Security in CI/CD(WithHands-on)
Name of the Expert:Dr.N.Sivakumar
Designation&Organization:Professor/CSE,Puducherry Technological University
Years of Exp: 20.

Session 11 2:00 PM - 3:30 PM
Topic: DevOps : Micro Services Architectures in DevOps
Name of the Expert: R. Tamiliniyan
Designation & Organization: Assistant Consultant, TCS
Years of Exp: 11

Session 12 3:30 PM - 5:00 PM
Topic: Cloud – Native DevOps Tools and Best Practices (Hands-on)
Name of the Expert: Saravana Balaji
Designation & Organization: Assistant Professor / Dept of Computing, De Montfort University Kazakhstan, Almaty, Kazakhstan.
Years of Exp: 18

Session 13 5:00 PM - 7:30 PM
Topic: Advanced Kubernetes: Networking and Service mesh
Name of the Expert: Shalini
Designation & Organization: Skill Development Engineer in AWS
Years of Exp: 16

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Department of Computer Science and Engineering

Coordinator

Dr. N. Balaji
Dean Academics cum Professor & Head/ CSE

Co- Coordinator

Dr. K. Andal
Associate Professor/ CSE

INSTITUTION

Vision

Our Vision is to impart the highest quality of Technical Education, provide impetus to Research and Development, foster innovation in the Technological growth, encourage Entrepreneurship and strive to solve problems of Mankind.

Mission

M1: Shaping Future Leaders – Cultivating the next generation of leaders through dynamic teaching and learning approaches while fostering a spirit of scientific inquiry to address global challenges.

M2: Strengthening Research and Collaboration – Enhancing the research ecosystem by establishing a robust platform for seamless interaction between industry, academia, and research institutions.

M3: Enhancing Industrial and Research Training – Providing high-quality education, research opportunities, and hands-on industrial training at various levels to bridge the gap between academics and real-world applications.

M4: Empowering People – Building a community of responsible, empathetic, and efficient individuals, fostering a culture of happiness, accountability, and effectiveness among students and professionals.

M5:Commitment to Society – Contributing to regional and global progress through the dissemination of knowledge, innovation, and compassionate service.

About the Institution

Sri Venkateshwaraa College of Engineering & Technology (SVCET) is a vibrant Institute of higher education established in the year 2014 with the objective of producing globally competitive and ethical Engineers with Industrial exposure. SVCET is approved by All India Council for Technical Education (AICTE) New Delhi,affiliated to Pondicherry University, NAAC 'A' graded and ISO certified institute. Our institute is offering Undergraduate courses of ECE, CSE, BME, MECH and EEE and Post graduate course of MBA.

About the Department

The Department of Computer Science and Engineering started in 2014 offers B.Tech. Computer Science and Engineering. The Course is affiliated to the Pondicherry University. The Department has highly qualified and proficient faculty members in the areas of Networking, Algorithms, Web Technology, Web Services, Grid Computing, Cloud Computing, Data Mining and Artificial Intelligence. The Department with well equipped laboratory imparts quality practical education. The Department aims to create computer engineers who can make a mark in many aspects of computing, from the design of individual microprocessors, personal computers and supercomputers to circuit design.
supercomputers

Objective

Learn fundamental concept and advantages of serverless architectures compared to traditional server based models. Gain practical skills deploying serverless functions using popular platforms like AWS lambda or Knative on Kubernetes. Implement automation strategies for deploying and managing serverless functions within CI/CD pipelines.

Targeted Participants

Assistant Professors/Ph.D. Scholar /PG students

Important Dates

Register Before: 02.01.2025

All the participants are requested to register by scanning the QR code and filling the Google form

Contact Details of the Coordinator

nbalajihodcse@svcet.ac.in
9944199803

Coordinator Details

Name :Dr. N.Balaji
Designation :Dean - Academics cum Professor & Head
Department :CSE

Co-Coordinator Details

Name :Dr. K.Andal
Designation :Associate Professor
Department :CSE

Chief Patrons

Shri. B. Ramachandiran, Chairman
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Smt. Mousmi Rajiv Krishna, Executive Director
Dr. B. Vidhya, Chief Operating Officer

Patrons

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Dr. K. B. Jayarraman, Vice Principal

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Dr. B. Magimairaj, HoD/MECH
Mr. R. Venkedesh, HoD/EEE
Mr. S. Balaji, HoD/BME
Mr. V. Ganesan, HoD/S&H
Mrs. A. Anitha, HoD/MBA

Research and Development Cell

Dr. G. Amuthavalli, Head

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Mrs. D. Nagamany Abirami, AP/CSE
Mrs. L. Sathiya, AP/CSE

Technical Committee

Ms. S. Vinitha, AP/CSE
Ms. S. Pavithra, AP/CSE
Mrs. M. Lavanya, AP/CSE

DEPARTMENT

Vision

To achieve academic excellence in the field of computer science and engineering by imparting meticulous knowledge to the students, facilitating research and entrepreneurship, to the ever-changing industrial demands and social needs through skill enhancement.

Mission

M1: To Enhance analytical knowledge by fostering innovation and problem-solving skills.

M2: To Promote interdisciplinary research and entrepreneurship for solving Real-world problems.

M3: To Impart students with the ability to tackle evolving industrial challenges.

M4: To Inculcate moral and ethical values to serve society.

- Funding from industry partners for research.

➢ Student Internships

- Students receive research internships AWS, Palo Alto ,Celonis, Blue prism, Juniper and Fortinet.

Celonis Certificate::

Blue prism Certificate:

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Certification & Global Field Enablement
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NEAT Cell, AICTE

Dr. Satya Ranjan Biswal
Chief Technology Officer (CTO)
EduSkills

Certificate ID :ea8808ca20c3c425d3965cf8eb865255
Student ID :STU62d11f5c673b81657872220

www.eduskillsfoundation.org

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Training Partner Manager, APAC
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NEAT Cell, AICTE

Dr. Satya Ranjan Biswal
Chief Technology Officer (CTO)
EduSkills

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Student ID :STU62d112c86866a1657869000

INTERNSHIP GRADE
O

GRADE- O (Outstanding):90-100 | E (Excellent):80-89 | A (Very Good):70-79 | B (Good): 60-69 | C (Fair): 50-59 | D (Average): 40-49 | P (Pass): 30-39 | F (Fail): Below 30

Certificate of Virtual Internship

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Vice President
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Dr. Satya Ranjan Biswal
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EduSkills

Certificate ID :ee0587c582092af61d4c270fbd418a05
Student ID :STU62d112c86866a1657869000

GRADE- O (Outstanding):90-100 | E (Excellent):80-89 | A (Very Good):70-79 | B (Good): 60-69 | C (Fair): 50-59 | D (Average): 40-49 | P (Pass): 30-39 | F (Fail): Below 30

AWS Certificate:

Certificate of Virtual Internship

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RITHIGA J

Sri Venkateshwaraa College of Engineering & Technology

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During Oct - Dec 2024

Curriculum Provided by:

aws academy

Shri Buddha Chandrasekhar
Chief Coordinating Officer (CCO)
NEAT Cell, AICTE

Dr. Satya Ranjan Biswal
Chief Technology Officer (CTO)
EduSkills

Certificate ID :c59e3bedfafed5af022ff7704322d360
Student ID :STU62d11f5c673b81657872220

GRADE- O (Outstanding):90-100 | E (Excellent):80-89 | A (Very Good):70-79 | B (Good): 60-69 | C (Fair): 50-59 | D (Average): 40-49 | P (Pass): 30-39 | F (Fail): Below 30

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5. Research-Driven Student Projects

➢ UG Research Projects

- Final-year projects aligned with industry problems and emerging technologies.

- Encouraging students to publish their project findings in journals and conferences.

Sign Language Translation

Kirthiversha.M, Devsri.S, Sowmiya.D, Arunthathi.S, Andal.K
Computer Science and Engineering, Sri Venkateshwaraa College of Engineering and
Technology, Pondicherry University, Puducherry, India.
E-mail: kirthivershaofficial123@gmail.com, devsri1209@gmail.com,
sowmiyadurai1724@gmail.com, arunthathisaravanan13@gmail.com,
sanandal86@gmail.com.

Abstract: Communication between normal people and people with disabilities i.e. Deaf- Mute society is not easy in day-to-day life. The communication gap between both people is mainly due to a lack of understanding between them. To minimize the gap, our trained model is going to act as a Translator. In this paper, the proposed work demonstrates two functionalities of the translator (a) conversion of text into animated video and (b) production of text by capturing the sign language shown by the deaf-mute people. Therefore, the translator can be widely used among people for better communication without knowing their disabilities. So, in the analysis of Sign Language Recognition (SLR) techniques, for object detection YOLO V7 and recognition of visual letters using Convolutional Neural Network (CNN) and Faster Region-Convolutional Neural Network (Faster R-CNN) can achieve more than 95% in accuracy after the implementation of the proposed model.

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Certificate of Appreciation

is hereby granted to

Mrs K Andal

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for **participation and presentation** of paper entitled

sign language translation

has presented at **4th International Conference on Artificial Intelligence, 5G Communications and Network Technologies (ICA5NT 2024)** organized by the **Department of Electronics and Communication Engineering & Department of Information Technology**, Velammal Institute of Technology, Chennai held on **21 & 22, March 2024.**

Coordinator	Coordinator	Coordinator	Convener	Convener	Principal
Dr.R.Jothi Chitra	Dr.M.Sivarathinabala	Mr.V.Vinothkumar	Dr.P.Deivendran	Dr.B.Sridevi	Dr.N.Balaji
Professor-ECE	Associate Professor-ECE	Assistant Professor-IT	Associate Professor & Head-IT	Professor & Head-ECE	

➢ Participation in Research Competitions & Hackathons

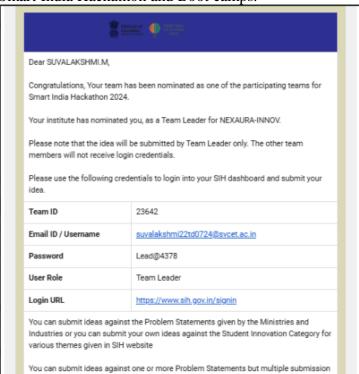• Smart India Hackathon and Boot camps.

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Email ID / Username	suvalakshmi22td0724@svcet.ac.in
Password	Lead@4378
User Role	Team Leader
Login URL	https://www.sih.gov.in/signin

You can submit ideas against the Problem Statements given by the Ministries and Industries or you can submit your own ideas against the Student Innovation Category for various themes given in SIH website

You can submit ideas against one or more Problem Statements but multiple submission

Boot Camps:

- Best project awards in National Hackathon.

The CSE Department prioritizes academic research by promoting faculty-student collaboration, funded projects, research publications, and industry partnerships. Through state-of-the-art labs, innovative projects, and interdisciplinary research, the department aims to contribute meaningfully to technological advancements and knowledge creation.