

(12) PATENT APPLICATION PUBLICATION

(19) INDIA

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(54) Title of the invention : Improving Customer Loyalty with Machine Learning: A Review of Churn Prediction Models

(51) International classification	:G06N002000000, G06Q0030020200, G06Q0030020000, G06N0003088000, G06N0003045000	(71) Name of Applicant : 1)Dr. R. Murugadoss Address of Applicant :Professor and Head, Artificial Intelligence and Data Science Department, ----- Name of Applicant : NA Address of Applicant : NA
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(57) Abstract :

Customer retention is a critical factor in business success, as acquiring new customers is often more costly than retaining existing ones. With the rise of data-driven decision-making, machine learning (ML) has emerged as a powerful tool for predicting customer churn and enhancing loyalty strategies. This paper provides a comprehensive review of machine learning methods used for churn prediction, examining their effectiveness, advantages, and limitations. We explore various supervised and unsupervised learning techniques, including decision trees, neural networks, support vector machines, and ensemble models, as well as deep learning approaches. Additionally, we discuss key factors influencing customer churn and how businesses can leverage ML insights to implement proactive retention strategies. The paper also highlights challenges in data quality, model interpretability, and ethical considerations. Finally, we provide recommendations for business practitioners to effectively apply ML-based churn prediction models for improved customer loyalty and long-term business growth.

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(19) INDIA

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(43) Publication Date : 14/02/2025

(54) Title of the invention : MACHINE LEARNING VOICE ASSISTED MEDICAL DEVICE

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(51) International classification : G16H0010600000, G06N002000000, G16H0050200000,  
G16H0040630000, G16H0050700000

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Number : NA  
Filing Date : NA

(57) Abstract :

The invention features a machine learning-powered, voiced-assistant medical device to generate a better experience for interaction from healthcare professionals to medical systems. Utilizing cutting-edge technology, the device combines state-of-the-art voice recognition capabilities with natural language processing (NLP) and machine learning techniques to accurately interpret and respond to medical queries in real time. It enables healthcare providers to issue voice commands to operate medical equipment, retrieve patient data and receive decision-support guidance informed by a patient's condition, medical history and real-time sensor data. It can also accurately process specialized medical terminology, handle noisy environments via noise cancellation, and generate dynamic, context-aware responses. Moreover, the system is configured for multilingual support and can be easily integrated into most existing healthcare infrastructures, allowing for wide applicability in various clinical environments.

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(19) INDIA

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(43) Publication Date : 05/04/2024

(54) Title of the invention : AI AND IOT BASED WATERBORNE DISEASE SURVEILLANCE FOR RAPID OUTBREAK DETECTION USING PIR SENSORS

(51) International classification :G01N0033180000, H04W0004380000, G01N0015060000, C12Q0001100000, C12Q0001682500  
(86) International Application No :NA  
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(87) International Publication No : NA  
(61) Patent of Addition to Application Number :NA  
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(62) Divisional to Application Number :NA  
Filing Date :NA

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(57) Abstract :

This methodology investigates the possibility of using modified PIR sensors in conjunction with AI and IoT for microbe detection in small heated water samples. Small, high—sensitivity PIR sensors (modified for potentially improved sensitivity) would be used alongside a microcontroller board, data acquisition system, and AI software. Water samples with varying microbe concentrations would be heated to a specific temperature. The sensor would continuously record data while the AI model is trained on prepossessed sensor data labeled with microbe concentration. The trained model would then analyze data from new samples with unknown microbe concentrations, aiming to detect and estimate microbe presence based on the sensor data. An IoT platform could be integrated for remote monitoring, data visualization, and real-time alerts based on the AI model's predictions. This approach explores the potential of sensor technology and AI applications in microbe detection, but challenges 'include sensor limitations, data complexity, and real-world applicability. This approach presents an exciting exploration at the intersection of sensor technology and AI applications in microbe detection. However, it's crucial to acknowledge the challenges. The limitations of the modified PIR sensors themselves come into play, as they might not be sensitive enough to capture the subtle thermal changes caused by microbes. Additionally, extracting meaningful data from the sensor readings amidst background noise and temperature fluctuations could pose a significant challenge for the AI model. Finally, the real-world applicability of this approach in environments with diverse water compositions and microbe types remains uncertain. Despite these limitations, this methodology offers a valuable thought experiment, pushing the boundaries of what's possible in microbe detection.

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(19) INDIA

(22) Date of filing of Application :26/03/2024

(21) Application No.202441023831 A

(43) Publication Date : 05/04/2024

(54) Title of the invention : AI AND CHATBOT BASED DIGITAL PLATFORM FOR LAND AND FOREST RIGHTS AWARENESS AND SUPPORT FOR ST COMMUN

(51) International classification	:G06Q0050180000, G06Q0010100000, G06Q0010060000, G06F0021620000, G06Q0030020000	(71) <b>Name of Applicant :</b> <b>1)V.S.B. College of Engineering Technical Campus</b> Address of Applicant :Professor & Head of the Department, Department of Artificial Intelligence and Data Science, V.S.B. College of Engineering Technical Campus, Kinathukadavu, Coimbatore -642109. drrmdcse@gmail.com ----- <b>Name of Applicant : NA</b> <b>Address of Applicant : NA</b>
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(57) Abstract :

AI and Chatbot based Digital Platform for Land and Forest Rights Awareness and Support for ST Communities \*Abstract: Scheduled Tribe (ST) communities often face challenges in understanding and asserting their land and forest rights. An AI-powered digital platform can bridge this gap by providing accessible and culturally relevant information. This platform would feature a multilingual Chatbot, allowing users to ask questions about land rights acts, grievance procedures, and entitlements in their native language. Easy-to-understand explainer videos, infographics, and downloadable booklets would further clarify complex legal concepts. Interactive modules like quizzes and simulations would make learning engaging. Beyond information, the platform would empower communities through a multilingual helpline with human experts to address specific situations. A safe online forum would foster peer support and knowledge sharing. A comprehensive legal aid directory would connect users with lawyers specializing in tribal land rights. Accessibility is key: the platform would function offline for areas with limited internet, and a voice interface would cater to users with low literacy or visual impairments. Partnerships with NGOs and local organizations would ensure outreach and training sessions using the platform. Robust data security measures would protect user privacy, particularly regarding sensitive land ownership information; The platform would be available in multiple local languages, recognizing the diverse linguistic needs of ST communities. Finally, a long-term plan for maintenance, content updates, and staff training would ensure the platform's continued effectiveness in empowering ST communities to claim their rightful ownership of land and forest resources.

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(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :15/10/2022

(21) Application No.202241058952 A

(43) Publication Date : 18/11/2022

(54) Title of the invention : ARTIFICIAL INTELLIGENCE BASED APPROACH TO ANALYSE THE PROS AND CONS OF MINI CHANNEL BASED SOLAR COLLECTORS FOR EFFECTIVE UTILIZATION OF SOLAR ENERGY

(51) International classification	:H01L0027092000, C07K0016280000, G06N0003020000, H01L0023310000, C02F0001140000	(71)Name of Applicant :
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(62) Divisional to Application Number	:NA	<b>5)DEEPTI AMRUT CHAUDHARI</b>
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(57) Abstract :

Artificial Intelligence based approach to analyse the pros and cons of mini channel based solar collectors for effective utilization of solar energy is the proposed invention. The proposed invention focuses on analysing the positive and negative aspects of mini channel-based collector. Also, the proposed invention aims at increasing the utilization of solar energy and increasing the efficiency of solar based devices.

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(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :30/07/2024

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(43) Publication Date : 02/08/2024

(54) Title of the invention : ARTIFICIAL INTELLIGENCE BASED WATER PURIFICATION SYSTEM TO SUPPLY DRINKING WATER WITH RIGHT NUTRIENTS

(51) International classification :C02F0001000000, C02F0001280000, C02F0001440000, C02F0001500000, C02F0001320000

(86) International Application No :NA  
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(61) Patent of Addition to Application Number :NA  
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(57) Abstract :

Artificial Intelligence based water purification system to supply drinking water with right nutrients is the proposed invention. The proposed invention focuses on designing a water filter that will filter of the water using the ceramic candles, one of the oldest methodologies to filter water. The ceramic candle is used such that the water is not cleaned too much, which is the major drawback of the existing water filters. The proposed water filter is designed to include the minerals, such that they can be added in required amount. This will help the water purifier users to stay away from the problems of mineral deficiency and stay healthy.

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(21) Application No.202441057830 A

(43) Publication Date : 02/08/2024

(54) Title of the invention : FARMER BOT FOR YIELD PREDICTION AND FERTILIZER RECOMMENDATIONS

(51) International classification	:G06N0020000000, H04L0051020000, G06N0003000000, G06N0005020000, G06N0005040000	(71) <b>Name of Applicant :</b> <b>1)S SOUNDHAR</b> Address of Applicant :ASSISTANT PROFESSOR, DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE V S B COLLEGE OF ENGINEERING TECHNICAL CAMPUS ----- <b>Name of Applicant : NA</b> <b>Address of Applicant : NA</b>
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(57) Abstract :

This study develops a chat room and a Chat-Bot to discuss the prevailing issues related to farming with peers and expertise and support farmers to make timely decision on farming. A standard set of questions was identified through discussions and surveys with farmers, expertise and other stakeholders. Intents, which the users might want to know, and examples, which the users use to explain a specific intent and entities that are different objects referring to an intent were identified from the questions. Artificial Intelligence Markup Language (AIML) was used to train a model, which predicts an intent based on the given example. The Chat-Bot was implemented in a cloud platform and therefore, the client end does not require more computational resources. Farmers loose their yield because they lack knowledge of new technologies and different parameters that help them increase their yield. Our proposed system performs machine learning analysis on all the valuable parameters required for increasing the farmers yield .We analyse the weather , season, rainfall ,and type of soil of a region and based on historic data train the system to suggest which crops to grow , and which mix crops grown together increase their yield We also answer all these farmers questions using auto-chat bot .This chat bot is NLP trained hence it learns on its own and improvises its answers .This system helps farmers in remote places where no connectivity is present to better understand the crop to be grown based on atmospheric conditions and also answer their basic questions on farming

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(19) INDIA

(22) Date of filing of Application :14/03/2025

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(54) Title of the invention : Driver Somnolence & Lethargy Detection Model based on Eyes & Facial Movement using OpenCV Library

(51) International classification	:G06V0020590000, A61B0005000000, G08B0021060000, A61B0005180000, A61B0005110000	(71) Name of Applicant : <b>1)Dr. R. Murugadoss</b> Address of Applicant :Professor and Head, Artificial Intelligence and Data Science Department, ----- <b>2)Mrs.V Murugalakshmi</b> <b>3)Mrs.D S Jayakumari</b> <b>4)Ms.D Jeevitha</b> Name of Applicant : NA Address of Applicant : NA
(86) International Application No	:NA	(72) Name of Inventor : <b>1)Kumara Guru S V</b> Address of Applicant :Department of Artificial Intelligence & Data Science V S B College of Engineering Technical Campus Coimbatore ----- <b>2)Stanis Jeba J</b> Address of Applicant :Department of Artificial Intelligence & Data Science V S B College of Engineering Technical Campus Coimbatore ----- <b>3)Srivimal M</b> Address of Applicant :Department of Artificial Intelligence & Data Science V S B College of Engineering Technical Campus Coimbatore ----- <b>4)Aurlian J</b> Address of Applicant :Department of Artificial Intelligence & Data Science V S B College of Engineering Technical Campus Coimbatore -----
(87) International Publication No	: NA	
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Filing Date	:NA	

(57) Abstract :

Driver Somnolence, Drowsiness & Fatigue Detection Model based on Eyes & Facial Movement using OpenCV Library Abstract: Drowsiness, or excessive sleep, otherwise referred to as somnolence, and fatigue, or lethargy, severely disrupt driver alertness hence leading to accidents because of longer reaction times and lack of good judgment. Prompt and early identification of those conditions is very important in enhancing road safety. Monitoring eye activity has been suggested as an appropriate way to inspect the presence of somnolence; it is argued that several studies have pointed to the fact that such technologies and algorithms for evaluating driver alertness are potentially useful. YOLO is commonly applied to analyze facial features in real-time, whereas PERCLOS and EAR are mainly used to quantify eye closure time and blinking rates, respectively. However, these single approaches have their shortcomings, such as imposters due to variation in illumination and inability to differentiate between normal blinking and drowsiness. We, therefore, propose an end-to-end algorithm which takes the best from PERCLOS, YOLO, and EAR-based approaches while at the same time minimizing the disadvantages these approaches have. Experimental findings authenticate that our model has elevated real-time detection accuracy, decreased false-positive alerts, and provided a much more stable solution to avoid accidents caused by tired drivers. The developed system looks to have a lot of potential for large-scale implementation and saving lives in drowsiness-related accidents.

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(54) Title of the invention : AI AND IOT BASED WATERBORNE DISEASE SURVEILLANCE FOR RAPID OUTBREAK DETECTION USING PIR SENSORS

(51) International classification :G01N0033180000, H04W0004380000, G01N0015060000, C12Q0001100000, C12Q0001682500  
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(62) Divisional to Application Number :NA  
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(57) Abstract :

This methodology investigates the possibility of using modified PIR sensors in conjunction with AI and IoT for microbe detection in small heated water samples. Small, high—sensitivity PIR sensors (modified for potentially improved sensitivity) would be used alongside a microcontroller board, data acquisition system, and AI software. Water samples with varying microbe concentrations would be heated to a specific temperature. The sensor would continuously record data while the AI model is trained on prepossessed sensor data labeled with microbe concentration. The trained model would then analyze data from new samples with unknown microbe concentrations, aiming to detect and estimate microbe presence based on the sensor data. An IoT platform could be integrated for remote monitoring, data visualization, and real-time alerts based on the AI model's predictions. This approach explores the potential of sensor technology and AI applications in microbe detection, but challenges 'include sensor limitations, data complexity, and real-world applicability. This approach presents an exciting exploration at the intersection of sensor technology and AI applications in microbe detection. However, it's crucial to acknowledge the challenges. The limitations of the modified PIR sensors themselves come into play, as they might not be sensitive enough to capture the subtle thermal changes caused by microbes. Additionally, extracting meaningful data from the sensor readings amidst background noise and temperature fluctuations could pose a significant challenge for the AI model. Finally, the real-world applicability of this approach in environments with diverse water compositions and microbe types remains uncertain. Despite these limitations, this methodology offers a valuable thought experiment, pushing the boundaries of what's possible in microbe detection.

No. of Pages : 7 No. of Claims : 4

(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :26/03/2024

(21) Application No.202441023831 A

(43) Publication Date : 05/04/2024

(54) Title of the invention : AI AND CHATBOT BASED DIGITAL PLATFORM FOR LAND AND FOREST RIGHTS AWARENESS AND SUPPORT FOR ST COMMUN

(51) International classification	:G06Q0050180000, G06Q0010100000, G06Q0010060000, G06F0021620000, G06Q0030020000	(71) <b>Name of Applicant :</b> <b>1)V.S.B. College of Engineering Technical Campus</b> Address of Applicant :Professor & Head of the Department, Department of Artificial Intelligence and Data Science, V.S.B. College of Engineering Technical Campus, Kinathukadavu, Coimbatore -642109. drrmdcse@gmail.com ----- <b>Name of Applicant : NA</b> <b>Address of Applicant : NA</b>
(86) International Application No	:NA	
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(61) Patent of Addition to Application Number	:NA	
Filing Date	:NA	
(62) Divisional to Application Number	:NA	
Filing Date	:NA	

(57) Abstract :

AI and Chatbot based Digital Platform for Land and Forest Rights Awareness and Support for ST Communities \*Abstract: Scheduled Tribe (ST) communities often face challenges in understanding and asserting their land and forest rights. An AI-powered digital platform can bridge this gap by providing accessible and culturally relevant information. This platform would feature a multilingual Chatbot, allowing users to ask questions about land rights acts, grievance procedures, and entitlements in their native language. Easy-to-understand explainer videos, infographics, and downloadable booklets would further clarify complex legal concepts. Interactive modules like quizzes and simulations would make learning engaging. Beyond information, the platform would empower communities through a multilingual helpline with human experts to address specific situations. A safe online forum would foster peer support and knowledge sharing. A comprehensive legal aid directory would connect users with lawyers specializing in tribal land rights. Accessibility is key: the platform would function offline for areas with limited internet, and a voice interface would cater to users with low literacy or visual impairments. Partnerships with NGOs and local organizations would ensure outreach and training sessions using the platform. Robust data security measures would protect user privacy, particularly regarding sensitive land ownership information; The platform would be available in multiple local languages, recognizing the diverse linguistic needs of ST communities. Finally, a long-term plan for maintenance, content updates, and staff training would ensure the platform's continued effectiveness in empowering ST communities to claim their rightful ownership of land and forest resources.

No. of Pages : 7 No. of Claims : 5

(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :15/10/2022

(21) Application No.202241058952 A

(43) Publication Date : 18/11/2022

(54) Title of the invention : ARTIFICIAL INTELLIGENCE BASED APPROACH TO ANALYSE THE PROS AND CONS OF MINI CHANNEL BASED SOLAR COLLECTORS FOR EFFECTIVE UTILIZATION OF SOLAR ENERGY

(51) International classification	:H01L0027092000, C07K0016280000, G06N0003020000, H01L0023310000, C02F0001140000	(71)Name of Applicant :
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(62) Divisional to Application Number	:NA	<b>5)DEEPTI AMRUT CHAUDHARI</b>
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(57) Abstract :

Artificial Intelligence based approach to analyse the pros and cons of mini channel based solar collectors for effective utilization of solar energy is the proposed invention. The proposed invention focuses on analysing the positive and negative aspects of mini channel-based collector. Also, the proposed invention aims at increasing the utilization of solar energy and increasing the efficiency of solar based devices.

No. of Pages : 13 No. of Claims : 5

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202441057879 A

(19) INDIA

(22) Date of filing of Application :30/07/2024

(43) Publication Date : 02/08/2024

(54) Title of the invention : ARTIFICIAL INTELLIGENCE BASED WATER PURIFICATION SYSTEM TO SUPPLY DRINKING WATER WITH RIGHT NUTRIENTS

(51) International classification :C02F0001000000, C02F0001280000, C02F0001440000, C02F0001500000, C02F0001320000

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

(87) International Publication No : NA

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

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

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(57) Abstract :

Artificial Intelligence based water purification system to supply drinking water with right nutrients is the proposed invention. The proposed invention focuses on designing a water filter that will filter of the water using the ceramic candles, one of the oldest methodologies to filter water. The ceramic candle is used such that the water is not cleaned too much, which is the major drawback of the existing water filters. The proposed water filter is designed to include the minerals, such that they can be added in required amount. This will help the water purifier users to stay away from the problems of mineral deficiency and stay healthy.

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(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :10/03/2025

(21) Application No.202541021597 A

(43) Publication Date : 21/03/2025

(54) Title of the invention : HYBRID AI FOR EMOTION- AWARE PERSONALIZED LEARNING

(51) International classification	:G10L0025630000, G06Q0050200000, G06V0040160000, G09B0005060000, G09B0007040000	(71) Name of Applicant : <b>1)Dr. R. Murugadoss</b> Address of Applicant :Professor and Head, Artificial Intelligence and Data Science Department, ----- <b>2)Mrs. V. Murugalakshmi</b> <b>3)Mrs. D.S.Jayakumari</b> <b>4)Mrs. G. Nithya</b> <b>5)Ms. M. Aberna Kumari</b> <b>6)Mr. S. Soundhar</b> Name of Applicant : NA Address of Applicant : NA
(86) International Application No	:NA	(72) Name of Inventor : <b>1)Ms. K. Sowmithra</b> Address of Applicant :Department of Artificial Intelligence and Data Science, V.S.B College of Engineering Technical Campus, Coimbatore. Coimbatore ----- -----
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(61) Patent of Addition to Application Number	:NA	
Filing Date	:NA	
(62) Divisional to Application Number	:NA	
Filing Date	:NA	

(57) Abstract :

**ABSTRACT:** The integration of Artificial Intelligence (AI) in education has opened new frontiers in personalized and adaptive learning. Traditional e-learning platforms often lack the ability to gauge student engagement, leading to passive learning experiences. This project aims to bridge this gap by utilizing multi-modal emotion recognition to analyse students' real-time emotional states, enhancing both student engagement and teacher effectiveness. Our model incorporates Convolutional Neural Networks (CNNs) for facial expression analysis, Wav2Vec for speech emotion recognition, and BERT for textual sentiment detection. These three components work together to capture emotions such as confusion, boredom, frustration, and interest, providing valuable insights into the student's learning process. The system continuously monitors these emotional cues and adjusts teaching methods accordingly to maintain an optimal learning experience. One major application of this project is in AI driven tutoring systems, where virtual tutors can modify their teaching pace, tone, and style based on a student's emotional feedback. If signs of stress or confusion are detected during an assessment, the AI can suggest personalized revision topics or provide simplified explanations to reinforce understanding. Additionally, teachers receive real-time reports on student engagement levels, helping them identify struggling learners and adapt lesson plans more effectively. By implementing emotion-aware learning, this system makes online education more interactive, engaging, and human-like. It fosters a more inclusive and adaptive educational environment, ensuring that students receive the necessary support to enhance their comprehension and academic performance. This innovative approach transforms digital learning into a more intuitive and student centred experience, paving the way for the future of AI-driven education.

No. of Pages : 11 No. of Claims : 10

(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :30/07/2024

(21) Application No.202441057830 A

(43) Publication Date : 02/08/2024

(54) Title of the invention : FARMER BOT FOR YIELD PREDICTION AND FERTILIZER RECOMMENDATIONS

(51) International classification	:G06N0020000000, H04L0051020000, G06N0003000000, G06N0005020000, G06N0005040000	(71) <b>Name of Applicant :</b> <b>1)S SOUNDHAR</b> Address of Applicant :ASSISTANT PROFESSOR, DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE V S B COLLEGE OF ENGINEERING TECHNICAL CAMPUS ----- <b>Name of Applicant : NA</b> <b>Address of Applicant : NA</b>
(86) International Application No Filing Date	:NA :NA	(72) <b>Name of Inventor :</b> <b>1)S Soundhar</b> Address of Applicant :Assistant Professor AI&DS V S B College of Engineering Technical Campus Coimbatore Coimbatore ----- <b>2)M Abernakumari</b> Address of Applicant :Assistant Professor,AI&DS V S B College of Engineering Technical Campus Coimbatore Coimbatore ----- <b>3)D Jeevitha</b> Address of Applicant :Assistant Professor,AI&DS V S B College of Engineering Technical Campus Coimbatore Coimbatore ----- <b>4)D S Jaya Kumari</b> Address of Applicant :Assistant Professor AI&DS V S B College of Engineering Technical Campus Coimbatore Coimbatore ----- <b>5)V MurugaLakshmi</b> Address of Applicant :Assistant Professor AI&DS V S B College of Engineering Technical Campus Coimbatore Coimbatore ----- <b>6)F Theophilus</b> Address of Applicant :Assistant Professor AI&DS V S B College of Engineering Technical Campus Coimbatore Coimbatore ----- <b>7)Dr R Murugadoss</b> Address of Applicant :Professor ,AI&DS,V S B College of Engineering Techmical Campus Coimbatore Coimbatore ----- <b>8)Dr P Venkadesh</b> Address of Applicant :Professor ,AI&DS, V S B College of Engineering Techmical Campus Coimbatore Coimbatore -----
(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 :

This study develops a chat room and a Chat-Bot to discuss the prevailing issues related to farming with peers and expertise and support farmers to make timely decision on farming. A standard set of questions was identified through discussions and surveys with farmers, expertise and other stakeholders. Intents, which the users might want to know, and examples, which the users use to explain a specific intent and entities that are different objects referring to an intent were identified from the questions. Artificial Intelligence Markup Language (AIML) was used to train a model, which predicts an intent based on the given example. The Chat-Bot was implemented in a cloud platform and therefore, the client end does not require more computational resources. Farmers loose their yield because they lack knowledge of new technologies and different parameters that help them increase their yield. Our proposed system performs machine learning analysis on all the valuable parameters required for increasing the farmers yield .We analyse the weather , season, rainfall ,and type of soil of a region and based on historic data train the system to suggest which crops to grow , and which mix crops grown together increase their yield We also answer all these farmers questions using auto-chat bot .This chat bot is NLP trained hence it learns on its own and improvises its answers .This system helps farmers in remote places where no connectivity is present to better understand the crop to be grown based on atmospheric conditions and also answer their basic questions on farming

No. of Pages : 9 No. of Claims : 5

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202541023106 A

(19) INDIA

(22) Date of filing of Application :14/03/2025

(43) Publication Date : 28/03/2025

(54) Title of the invention : Driver Somnolence & Lethargy Detection Model based on Eyes & Facial Movement using OpenCV Library

(51) International classification	:G06V0020590000, A61B0005000000, G08B0021060000, A61B0005180000, A61B0005110000	(71) Name of Applicant : <b>1)Dr. R. Murugadoss</b> Address of Applicant :Professor and Head, Artificial Intelligence and Data Science Department, ----- <b>2)Mrs.V Murugalakshmi</b> <b>3)Mrs.D S Jayakumari</b> <b>4)Ms.D Jeevitha</b> Name of Applicant : NA Address of Applicant : NA
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(87) International Publication No	: NA	
(61) Patent of Addition to Application Number	:NA	
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(62) Divisional to Application Number	:NA	
Filing Date	:NA	

(57) Abstract :

Driver Somnolence, Drowsiness & Fatigue Detection Model based on Eyes & Facial Movement using OpenCV Library Abstract: Drowsiness, or excessive sleep, otherwise referred to as somnolence, and fatigue, or lethargy, severely disrupt driver alertness hence leading to accidents because of longer reaction times and lack of good judgment. Prompt and early identification of those conditions is very important in enhancing road safety. Monitoring eye activity has been suggested as an appropriate way to inspect the presence of somnolence; it is argued that several studies have pointed to the fact that such technologies and algorithms for evaluating driver alertness are potentially useful. YOLO is commonly applied to analyze facial features in real-time, whereas PERCLOS and EAR are mainly used to quantify eye closure time and blinking rates, respectively. However, these single approaches have their shortcomings, such as imposters due to variation in illumination and inability to differentiate between normal blinking and drowsiness. We, therefore, propose an end-to-end algorithm which takes the best from PERCLOS, YOLO, and EAR-based approaches while at the same time minimizing the disadvantages these approaches have. Experimental findings authenticate that our model has elevated real-time detection accuracy, decreased false-positive alerts, and provided a much more stable solution to avoid accidents caused by tired drivers. The developed system looks to have a lot of potential for large-scale implementation and saving lives in drowsiness-related accidents.

No. of Pages : 12 No. of Claims : 10

# UNIVERSAL APPROXIMATION WITH NON-SIGMOID HIDDEN LAYER ACTIVATION FUNCTIONS BY USING ARTIFICIAL NEURAL NETWORK MODELING

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## Abstract

Neural networks are modeled on the way the human brain. They are capable of learning and can automatically recognize by skillfully training and design complex relationships and hidden dependencies based on historical example patterns and use this information for forecasting. The main difference, and at the same time is biggest advantage of the model of neural networks over statistical techniques seen that the forecaster the exact functional structure between input and Output variables need not be specified, but this by the system with certain Learning algorithms is "learned" using a kind of threshold logic. Goal of the learning procedure is to define the training phase while those parameters of the network, with Help the network has one of those adequate for the problem behavior. Mathematically, the training phase is an iterative, converging towards a minimum error value process. They identify the processors of the network, minimize the "total error". The currently the most popular and most widely for business applications algorithm is the backpropagation algorithm. This paper opens the black box of Backpropagation networks and makes the optimization process in the network over time and locally comprehensible.

**Keywords:** FPGA; Sigmoid Activation Function; Artificial Neural Network (ANN).

## 1. Introduction

Neural networks are capable of learning, information processing systems, the large from a Number of simple units (cells, neurons, or "units") which is the information in the form of activation of the cells via their connections ("connections, links"). A distinction is generally made between biological and artificial networks. in the event of a biological or natural neural network represent the neurons and the network is part of the nervous system of a biological organism. The processed information is biological information essentially of nerve impulses In an artificial neural network are the Neurons implemented as mathematical models whose formalized behavior principle the biological neurons corresponds. The processed information here can be call pattern ("pattern"). The information processing itself is done by Interaction between the individual units, which have a positive (excitatory) or negative (inhibitory) signals lovely reminder, if certain thresholds exceed. The Units are available via links in contact, which the Strengthen or weaken signals. The compounds at the entrance of a unit each having a weight which determines the strength of the connection. The weights of connections (algorithms) can be changed due to certain regulations. This process is called one training, learning or self-adaptation. Puts the "knowledge" of an ANN So in the weights and is distributed over the entire network (distributed knowledge representation) . The complex and intense combination of the individual neurons with each other ultimately determines the concept of connectionism. Simplified mathematical model to simulate neural network information biological nervous system to perform certain aspects of treatment. Adopted a number of principles in nature, including parallel processing, for example, by learning and knowledge abstraction. Neural computing is a fast-growing branch of study, which is different from the continuous development of new applications of neural networks. Pattern recognition and classification is a typical application of this method. Many tasks in earth sciences, especially in the interpretation of data, consider and treat the classification problem. In this terminology, the study (earth model, for example, sub-region) of the object is divided into a characteristic (e.g., physical

properties), based on the rock type. Numerical solutions to face as incorrect and incomplete nature of the data and the overlapping challenges in some of the properties of different lithologies. Self-organizing map is an interesting concept, which allows classification of certain behavior by unsupervised learning. We have developed a workflow GFZ, including data preparation, application of learning rules, segmentation maps trained, using image processing technology, and application of knowledge. The application displays the Northeast basin from Germany and Indonesia, merged into a joint lithologic interpretation of geothermal exploration projects in different geophysical models of the same research.

## 2. Literature Survey

Many different physical systems of financial markets, because we know that time is the financial market is a complex feedback mechanism. What people expect prices affect the price of their observations, and then observe their prices in turn affect how they form what price they will be expected next period. Market is basically a beast unclear or uncertain system is a system that people exchange rate risk, exchange rate risk, which is why it is there. Therefore, it is possible to predict if there will be dangerous. In person, I think there is no system available to the public, in order to predict the financial markets. On the other hand, neural networks have been found in predicting stock prices is useful. Both feedforward and feedback neural networks have been studied, and success. This means that the prediction software will be very useful to help people make the final decision. In this article, assume that it is possible to predict the market, forecasting system using fuzzy neural network learning algorithm to predict future stock value development. Several modules of the system by neural networks. These models are used to study the relationship between the technical and economic indicators and decide to buy or sell stocks. Input to the network in the technical and economic indices. The output of the system is to decide to buy and sell. There are several methods for neural network stock prediction method of time series, often neural network and feedforward neural network method. When compared with these technologies, the process of fuzzy neural network, which will be described in subsequent sections of a very useful and effective method. Learning algorithm to train the network, when you start learning, tolerance is defined as output units. In learning, the weights only when the output error exceeds the allowable limit updates. Power error within the tolerance range of learning data is eliminated from the training data set. Each network input data by using a Java program is directly obtained from the average value data of the week moving average site. The simulation output data is the data amount of the weekly average. Predictive analysis of past projects estimated time series data and future data values. Basically, this method attempts to derive value from the past recursive relationship model nonlinear function. Recursive relationship can be used to predict the time sequence in which the hope that the new value is a good approximation of the actual value. Two basic types of time series forecasting: univariate and multivariate analysis. Single-factor model, such as boxes Jenkins, including recurrence equation is only one variable. Containing equations used in the model, and the moving speed of the intermediate values in the past. Box Jenkins good short-term prediction, but requires large amounts of data, and is complicated to determine an appropriate process model equations and parameters. Multivariate model is a single-variable model was extended to "behavior found to affect the data causal factor. As its name implies, these models contain a number of variables in their equations. Regression analysis is a multivariate model, which is often compared to the neural network. In the general case, the time series forecasting with reasonable accuracy for a short time, but the accuracy of the time series forecasting a sharp decline in the predicted length increases. Many other computer techniques have been used to predict the stock market. They range from tracking program to complex expert systems. Fuzzy logic is also used. Process expert system knowledge of the order and the development of regulations. They can be used to develop trading rules based on technical indicators. In this capacity, the expert system can use neural networks to predict the market combined. In the combined system, neural network can perform its forecast, while the expert system can verify the prediction based on the well-known commercial standards. Advantage of the expert system, they can be obtained by interpretation of their results. Neural network, the input data is difficult to analyze, and the importance of how to get the result in the network. However, the speed of neural networks faster because they run in parallel, and fault tolerant. The main problem is the use of expert systems market in developing markets, because we ourselves do not fully understand the difficulty of knowledge. Expert systems have the advantage of fuzzy neural networks because they can extract rules, without the need for explicit formalization. In a highly confused and only partially understood, such as the stock market, this environment is an important factor. Expert information is difficult to extract and use by the expert system in the form of regularization. Knowledge of expert system, its scope is only good part, when it does not work, there are missing or incomplete information. Neural networks to better manage dynamic data, can be summarized, so that "speculation." Therefore, the neural network expert system is more suitable for the stock market environment. In a variety of different models, so far described, each model has its own advantages and disadvantages. The best way is to use these methods works best when we work together. Using fuzzy neural network is the main advantage of the network to learn how to use these methods combine efficiency, and want to understand the behavior of the market as a factor in our collective consciousness.

### 3. Methodology

The activity control system based on fuzzy logic, fuzzy neural network usually has five functional layers: (1) The first layer is the input layer. (2) Layer 2 is the fuzzy layer; (3) Layer 3 is the fuzzy inference layer may consist of one or more layer of Y and; (4) Layer 4 is the defuzzification layer; (5) The fifth layer is output layer. Fuzzy neural network structure shown in Figure 1 depicts a general fuzzy neural network input crisp map Hee (I = 1,2, ..., N) crisp output Yi (J = 1, 2, ..., M). Fuzzy neural network is built layer by layer as linguistic variables, IF-THEN rules fuzzy control system, fuzzy logic, fuzzy reasoning and fuzzy fuzzy reasoning schemes and fuzzy programs. Enter the representatives of each neuron fuzzy layer of a fuzzy rule antecedent membership functions. Membership functions for common way to apply this coating is expressed in discrete points. Therefore, the fuzzy rule "if X1 and X2 is for A1 A2 ..... then Y is B", A premise of the terms "X is a" possibility distribution features. Each of the fuzzy inputs is defined as in the spatial reference point of hidden nodes. Defuzzification layer, the function of the rules evaluated. In each neuron layer is a subsequent proposal, "then y is B" and the membership functions can be combined with one or two S-shaped function and the linear function to achieve.

#### Learning Algorithm

An  $n$  inputs and one output fuzzy neural network has  $m$  fuzzy if-then rules, by the specified

$$\text{IF } x_1 \text{ is } A_1^k \text{ and } \dots \text{ and } x_n \text{ is } A_n^k \text{ THEN } y \text{ is } B^k,$$

Where  $x_i$  and  $y$  are input and output fuzzy linguistic variables, respectively. Fuzzy linguistic values  $A_i^k$  and  $B^k$  are defined by fuzzy membership functions as follows,

$$\mu_{A_i^k}(x_i) = \exp\left[-\left(\frac{x_i - a_i^k}{\sigma_i^k}\right)^2\right] \quad (1)$$

$$\mu_{B^k}(y) = \exp\left[-\left(\frac{y - b^k}{\eta^k}\right)^2\right] \quad (2)$$

The  $n$ -input-1-output fuzzy neural network with modest fuzzy cognitive is defined below:

$$f(x_1, \dots, x_n) = \frac{\sum_{k=1}^m b^k [\prod_{i=1}^n \mu_{A_i^k}(x_i)]}{\sum_{k=1}^m [\prod_{i=1}^n \mu_{A_i^k}(x_i)]} \quad (3)$$

Given  $n$ -dimensional input data vectors  $x^p$  (i.e.,  $x^p = (x_1^p, x_2^p, \dots, x_n^p)$ ) and one-dimensional output data vector  $y^p$  for  $p=1,2,\dots,N$ , (i.e.,  $N$  training data sets). The energy function for  $p$  is defined by

$$E^p = \frac{1}{2} [f(x_1^p, \dots, x_n^p) - y^p]^2 \quad (4)$$

For simplicity, let  $E$  and  $f^p$  denote  $E^p$  and  $f(x_1^p, \dots, x_n^p)$ , respectively. After training the centers of output membership functions ( $\frac{\partial E^p}{\partial b^k}$ ), the widths of output membership functions ( $\frac{\partial E^p}{\partial \sigma^k}$ ), the centers of input membership functions ( $\frac{\partial E^p}{\partial a^k}$ ) and the centers of input membership functions ( $\frac{\partial E^p}{\partial \eta^k}$ ), then we obtain the training algorithm:

$$b^k(t+1) = b^k(t) - \theta \frac{\partial E^p}{\partial b^k} \Big|_t \quad (5)$$

$$\sigma^k(t+1) = \sigma^k(t) - \theta \frac{\partial E^p}{\partial \sigma^k} \Big|_t \quad (6)$$

$$a^k(t+1) = a^k(t) - \theta \frac{\partial E^p}{\partial a^k} \Big|_t \quad (7)$$

$$\eta^k(t+1) = \eta^k(t) - \theta \frac{\partial E^p}{\partial \eta^k} \Big|_t \quad (8)$$

Where,  $\eta$  is the learning rate and  $t = 0, 1, 2, \dots$ . The main steps using the learning algorithm as follows:

- Step 1:** Present an input data sample, compute the corresponding output;
- Step 2:** Compute the error between the output(s) and the actual target(s);
- Step 3:** The connection weights and membership functions are adjusted;
- Step 4:** At a fixed number of epochs, delete useless rule and membership function nodes, and add in new ones;
- Step 5:** IF Error > Tolerance THEN go to Step 1 ELSE stop.

When the error level falls below the tolerance specified by the user, the weight of the weight of the interconnected ends of the change reflects the initial fuzzy rules and membership functions. If the resultant weight rule is close to zero, the rule can be safely removed from the rule base, because it is negligible compared to other. Further, by adjusting the parameters of neurons, in the process of forming these layers and adjusted to the fuzzification of the shape and position of the fuzzy membership function layer.

#### 4. Proposed System

The system can predict the future of any exchange or market index. For example, to predict the number of days of Microsoft's value shares, it requires historical data. Data for the neural network may be the most important aspect of the training. No user intervention, including data obtained with the needs of users directly via the Internet, in this process, the user can decide what kind of action they want to achieve, how long the relevant price information. Pre-processing operation is necessary as a preparation step of the next stage. As an example of pre-treatment, the daily price data is downloaded, the periphery of a packet through, and the average is calculated every week for the next step. Write an HTML parser in Java to retrieve data.

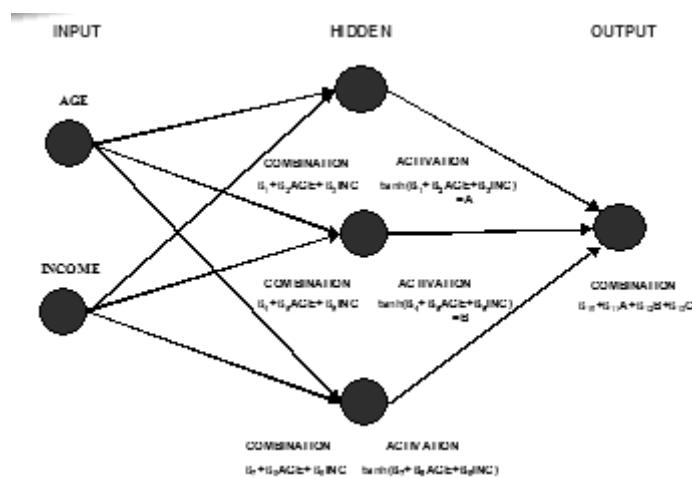


Figure 1 Sigmoid activation function

The program analyzes the entire file line by line, in order to obtain the necessary information, and insert it into the database. All training data system, the preparation of 2-input 1-output formats:  $(D_1, D_2, D_3 \dots), (D_2, D_3, D_4 \dots)$ , wherein for said first vector,  $D_1$  and  $D_2$  and  $D_3$  is input as the output, and the second vector,  $D_2$  and  $D_3$  and  $D_4$  is the entry is a way out. It has some of the parameters to be used during training. Exact results son error threshold, depending on tolerances, etc. These parameters. In order to quickly achieve our goals, some of the parameters pretreatment. For example, the diffusion function of the members 1 and 2, there are two important parameters: the center and the width of fuzzy sets. Their initial value on system performance has a critical influence. A random value generated by the machine is not optimal. In this system, a simple method is proposed to optimize the initial values: all of the data from the Internet to sort, and then divided into five groups of data to obtain an average value of each group, these values are used in the fuzzy set of features the initial value of the center. The prediction algorithm will need to enter these parameters. When you click to enter the stock symbol, the prediction system called the future of this algorithm. This algorithm allows neural network learning. The algorithm returns to the next output values are stored in witch finally results in the Table for each population. The average error until you click on this special group for all analog, we will track these results. An organic neural network has 10 one billion parallel highly interconnected neurons. Each neuron may receive other neurons over 200,000 electrochemical signal. These connections can be changed by environmental stimuli. If the correct input is received, the trigger signal in neurons and send excitatory or inhibitory signals to other neurons. In the data analysis, artificial neural network is a kind of prediction for the supervision, flexible non-linear models. However, due to the attached analog neurophysiology, and is generally considered more attractive than other predictive

models. Artificial neural network construction basic building blocks are called hidden units. Hidden units are model neurons. Each hidden unit receives input variable linear combination. The weight coefficients are known weight. Transform a linear combination of the activation function, and then send them to another drive and then use it as input.

## 5. Experiment Result

The input vector and the corresponding destination vector to be used to train the network until it can be approximated function to the input vector of the input vector of the vector associated with a particular output, or classified in an appropriate manner as defined by you. Network prejudices, S-shaped layer, and a linear output layer can approximate any function discontinuous finite number. Is a standard back-propagation gradient descent algorithm, such as learning the rules of Widrow- Hof, where network weights, moving along the slope of the negative performance of the function. This term refers to multiple back-propagation network nonlinear gradient layer calculated. There are some changes in the basic algorithm is based on other conventional optimization techniques, such as Newton's method and conjugate gradient. Properly trained back-propagation network often presents with their investment never seen when making a reasonable answer. Usually lead to a new input is similar to the correct output using the input vector in the training input is similar to the new proposed output. This property allows a group to summarize / destination entry represents, and get a good result on the training network, and all possible input / output training network. Still, aimed at improving the generalization of neural network software network two characteristics: regularization and early stopping. The popularity of the algorithm is that the flexibility of the network, capture the hidden features in your application data. Simple view may represent linearly separable FNS limits are exceeded. Only BP algorithm provides a multi-layer network of more power before general learning rules. The foundation is called gradient descent optimization algorithm that, during the study, each connection WTS technology. The slope at the current location of the network by a global amount proportional to the amount of error metrics can be adjusted. Based on the results in the formation stage of the iterative process, we found that the best architecture of MLP neural network comprising an input layer, eight, 10 hidden neurons in the first hidden layer, 14 neurons in the second hidden layer, the hidden and layer neuron output a (building 8-10-14-1). Scatter ozone concentrations predicted values and observed the training set and test set is in Figure 4, the average absolute error (MAE) and root mean square error shown (RMSE), for the training data for 8.64 and 11.84 ppbv respectively. The test data set corresponding errors were 10.26 and 13.53 ppbv, respectively. In order to further validate the accuracy of the MLP model developed to predict the ozone concentration was observed to predicted values are shown in Figure 5 and 6 are in good agreement with the recording density, a graph of ozone, O<sub>3</sub> represents a horizontal maximum taken by MLP mode is quite good.

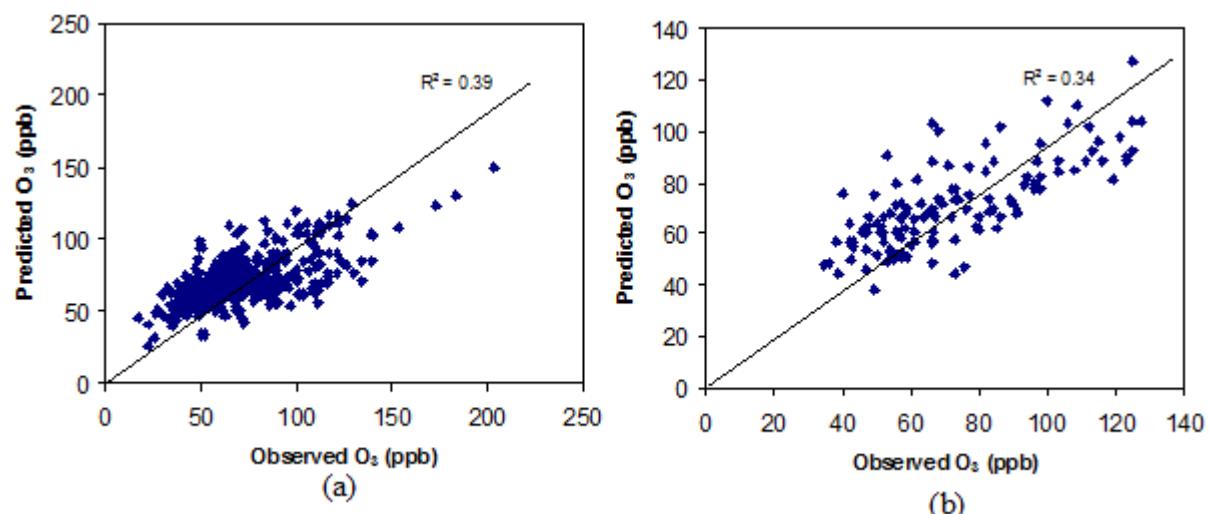


Figure 2: Scatter plots of observed versus predicted ozone levels of regression model.  
(a) Training dataset; and (b) testing dataset.

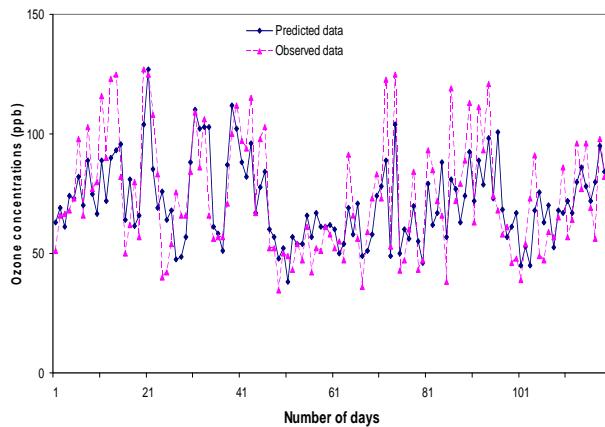


Figure 3: Comparison of observed and predicted ozone levels of regression model for the testing dataset.

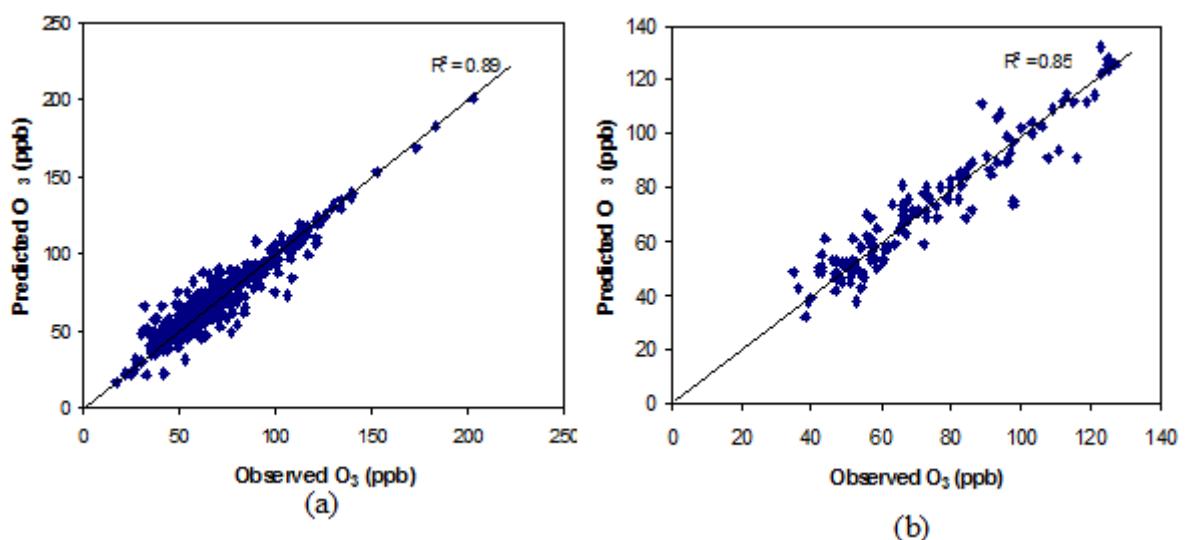


Figure 4: Scatter plots of observed versus predicted values of MLP model. (a) Training dataset; and (b) Testing dataset.

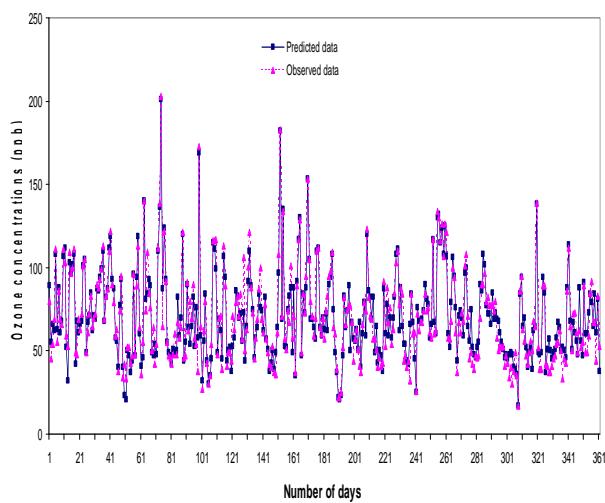


Figure 5: Comparison of observed and predicted ozone for the training dataset of the MLP model.

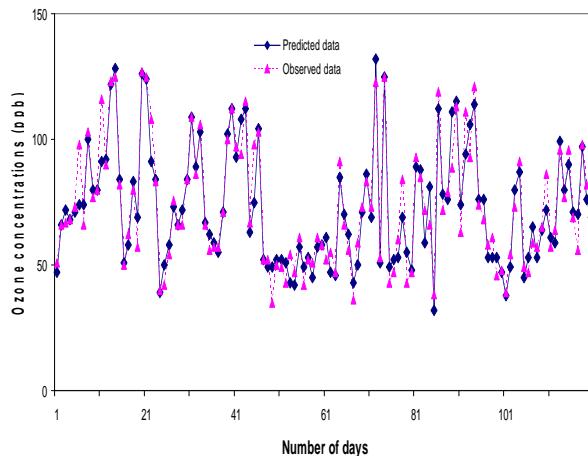


Figure 6: Comparison of observed and predicted ozone for the testing dataset of the MLP model.

#### *Comparative analysis of the developed models*

We examined the relative effectiveness of the models in predicting ozone levels using the testing data set. The performance of the developed models was evaluated using statistical indicators and graphical comparisons (Table 2 and Figure 7).

Table 2: Performance statistical indicators for the developed models

Indicators	MLP		LR	
	Training	Testing	Training	Testing
MAE (ppb)	8.64	10.26	16.91	16.42
RMSE (ppb)	11.84	13.53	21.4	22.42
R <sup>2</sup>	0.89	0.85	0.39	0.34
d	0.92	0.89	0.74	0.68

It can be seen clearly under the best results for all of the statistical indicators of the MLP model. In terms of beauty and rms values, MLP model than the regression model for better performance datasets. Figure 6 shows a high concentration of ozone in the horizontal prediction is significantly worse linear regression model. The reason for this is undervalued is placed in question the regression coefficients, the use of "least squares" standard solutions. A direct consequence is that the LR model properties, such that the low level and a high value there is no difference. The purpose of regression analysis method is to simulate the "normal" to forecast the amount of variables (output), with respect to the behavior of air quality standards, the level of extreme O<sub>3</sub> forecast is much more important from the point of a health standpoint. Despite the s strongly nonlinear, the MLP this phenomenon is given daily maximum 1 hour ozone AAQS pretty good predict 100 ppbv. In order to study the results of this study and previously published prediction model ozone compare artificial neural network, which is the most common manifestation of the three indicators, namely the United States, root mean square error and the coefficient of determination, R<sup>2</sup>, is used. Table 3 shows the results of some selected published. Table 3 shows the neural network model range worldwide Bangkok results with similar studies reported results. Interesting to note that, in the study examined the neural network model similar performance, although the test cases were applied to different urban environments, in different weather conditions and at different time periods. The MLP model Bangkok urban development should take into account specifically for this area. While this is possible, it is impossible to extend this study to other websites accurate model, this method may be generalizable. With our specific data model another issue is the choice in this study is limited to the period 2000-2003, January 1 to April 30 of. This period is interesting because it represents the worst case ozone pollution in the Bangkok area. Seasonal factors in the model to minimize the impact of this choice. Therefore, it may not be appropriate for use of the model for the other seasons due to seasonal changes in ozone formation. Measuring prediction model developed in this study in the morning with the independent variables in predicting the day. Use the balance of the predicted value is not severely limited the effectiveness of the model to predict ozone levels in advance, because the model can be modified by using more alternative variables.

## 6. Conclusion

This paper describes the number between neurons and hidden nodes and connection weights before MLP model can be used to predict the hidden layer of MLP network through an iterative process using training data (learning) stage determined through statistical indicators of performance (see Annex details) training error measured error below. The initial values of the weights are randomly selected, and may be negative and positive values. In addition, the activation function used in the hidden layer and output layer is studied by the accuracy required to determine the problem. In this study, the learning algorithm used is Levenberg - Marquardt back-propagation neural network MATLAB toolbox. Sigmoid layer through logical and linear activation functions for the hidden layer to the output layer selected. They tried to hide layers and hidden neurons (nodes) and to systematically increase the number of checks each time, graphs obtained if the neural network performance and stability of yield errors preparation. The best MLP network was found most suitable for the iterative process. The MLP network trained model is used to model the performance of the test pattern 120 of the test data set. Predict the results obtained with the observed data for comparison, and calculate statistical performance indicators.

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(57) Abstract :

Customer retention is a critical factor in business success, as acquiring new customers is often more costly than retaining existing ones. With the rise of data-driven decision-making, machine learning (ML) has emerged as a powerful tool for predicting customer churn and enhancing loyalty strategies. This paper provides a comprehensive review of machine learning methods used for churn prediction, examining their effectiveness, advantages, and limitations. We explore various supervised and unsupervised learning techniques, including decision trees, neural networks, support vector machines, and ensemble models, as well as deep learning approaches. Additionally, we discuss key factors influencing customer churn and how businesses can leverage ML insights to implement proactive retention strategies. The paper also highlights challenges in data quality, model interpretability, and ethical considerations. Finally, we provide recommendations for business practitioners to effectively apply ML-based churn prediction models for improved customer loyalty and long-term business growth.

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(57) Abstract :

The invention features a machine learning-powered, voiced-assistant medical device to generate a better experience for interaction from healthcare professionals to medical systems. Utilizing cutting-edge technology, the device combines state-of-the-art voice recognition capabilities with natural language processing (NLP) and machine learning techniques to accurately interpret and respond to medical queries in real time. It enables healthcare providers to issue voice commands to operate medical equipment, retrieve patient data and receive decision-support guidance informed by a patient's condition, medical history and real-time sensor data. It can also accurately process specialized medical terminology, handle noisy environments via noise cancellation, and generate dynamic, context-aware responses. Moreover, the system is configured for multilingual support and can be easily integrated into most existing healthcare infrastructures, allowing for wide applicability in various clinical environments.

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(57) Abstract :

This methodology investigates the possibility of using modified PIR sensors in conjunction with AI and IoT for microbe detection in small heated water samples. Small, high—sensitivity PIR sensors (modified for potentially improved sensitivity) would be used alongside a microcontroller board, data acquisition system, and AI software. Water samples with varying microbe concentrations would be heated to a specific temperature. The sensor would continuously record data while the AI model is trained on prepossessed sensor data labeled with microbe concentration. The trained model would then analyze data from new samples with unknown microbe concentrations, aiming to detect and estimate microbe presence based on the sensor data. An IoT platform could be integrated for remote monitoring, data visualization, and real-time alerts based on the AI model's predictions. This approach explores the potential of sensor technology and AI applications in microbe detection, but challenges 'include sensor limitations, data complexity, and real-world applicability. This approach presents an exciting exploration at the intersection of sensor technology and AI applications in microbe detection. However, it's crucial to acknowledge the challenges. The limitations of the modified PIR sensors themselves come into play, as they might not be sensitive enough to capture the subtle thermal changes caused by microbes. Additionally, extracting meaningful data from the sensor readings amidst background noise and temperature fluctuations could pose a significant challenge for the AI model. Finally, the real-world applicability of this approach in environments with diverse water compositions and microbe types remains uncertain. Despite these limitations, this methodology offers a valuable thought experiment, pushing the boundaries of what's possible in microbe detection.

No. of Pages : 7 No. of Claims : 4

(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :26/03/2024

(21) Application No.202441023831 A

(43) Publication Date : 05/04/2024

(54) Title of the invention : AI AND CHATBOT BASED DIGITAL PLATFORM FOR LAND AND FOREST RIGHTS AWARENESS AND SUPPORT FOR ST COMMUN

(51) International classification	:G06Q0050180000, G06Q0010100000, G06Q0010060000, G06F0021620000, G06Q0030020000	(71) <b>Name of Applicant :</b> <b>1)V.S.B. College of Engineering Technical Campus</b> Address of Applicant :Professor & Head of the Department, Department of Artificial Intelligence and Data Science, V.S.B. College of Engineering Technical Campus, Kinathukadavu, Coimbatore -642109. drrmdcse@gmail.com ----- <b>Name of Applicant : NA</b> <b>Address of Applicant : NA</b>
(86) International Application No	:NA	
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(87) International Publication No	: NA	<b>(72)Name of Inventor :</b> <b>1)Dr.R.Murugadoss</b> Address of Applicant :V.S.B. College of Engineering Technical Campus, Kinathukadavu, Coimbatore -642109. drrmdcse@gmail.com -----
(61) Patent of Addition to Application Number	:NA	
Filing Date	:NA	
(62) Divisional to Application Number	:NA	
Filing Date	:NA	

(57) Abstract :

AI and Chatbot based Digital Platform for Land and Forest Rights Awareness and Support for ST Communities \*Abstract: Scheduled Tribe (ST) communities often face challenges in understanding and asserting their land and forest rights. An AI-powered digital platform can bridge this gap by providing accessible and culturally relevant information. This platform would feature a multilingual Chatbot, allowing users to ask questions about land rights acts, grievance procedures, and entitlements in their native language. Easy-to-understand explainer videos, infographics, and downloadable booklets would further clarify complex legal concepts. Interactive modules like quizzes and simulations would make learning engaging. Beyond information, the platform would empower communities through a multilingual helpline with human experts to address specific situations. A safe online forum would foster peer support and knowledge sharing. A comprehensive legal aid directory would connect users with lawyers specializing in tribal land rights. Accessibility is key: the platform would function offline for areas with limited internet, and a voice interface would cater to users with low literacy or visual impairments. Partnerships with NGOs and local organizations would ensure outreach and training sessions using the platform. Robust data security measures would protect user privacy, particularly regarding sensitive land ownership information; The platform would be available in multiple local languages, recognizing the diverse linguistic needs of ST communities. Finally, a long-term plan for maintenance, content updates, and staff training would ensure the platform's continued effectiveness in empowering ST communities to claim their rightful ownership of land and forest resources.

No. of Pages : 7 No. of Claims : 5

(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :15/10/2022

(21) Application No.202241058952 A

(43) Publication Date : 18/11/2022

(54) Title of the invention : ARTIFICIAL INTELLIGENCE BASED APPROACH TO ANALYSE THE PROS AND CONS OF MINI CHANNEL BASED SOLAR COLLECTORS FOR EFFECTIVE UTILIZATION OF SOLAR ENERGY

(51) International classification	:H01L0027092000, C07K0016280000, G06N0003020000, H01L0023310000, C02F0001140000	(71)Name of Applicant :
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(87) International Publication No	: NA	<b>2)DILIP MISHRA</b>
(61) Patent of Addition to Application Number	:NA	<b>3)DR. SANYASI NAIDU DADI</b>
Filing Date	:NA	<b>4)GLADYS JEBAKUMARI GNANADURAI</b>
(62) Divisional to Application Number	:NA	<b>5)DEEPTI AMRUT CHAUDHARI</b>
Filing Date	:NA	<b>6)MS D JEEVITHA</b>
		<b>7)VASUPALLI MANOJ</b>
		<b>8)S ARUN KUMAR</b>
		<b>9)AAKULA SWATHI</b>
		<b>10)RAHUL SINGH</b>
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		<b>5)DEEPTI AMRUT CHAUDHARI</b>
		Address of Applicant :ASSISTANT PROFESSOR DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING, B 501, PRIME SQUARE, NEAR ROSELAND RESIDENCY, KUNAL ICON RIAD, PIMPLE SAUDAGAR, PUNE- 411027 MAHARASHTRA. INDIA. PUNE -----
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(57) Abstract :

Artificial Intelligence based approach to analyse the pros and cons of mini channel based solar collectors for effective utilization of solar energy is the proposed invention. The proposed invention focuses on analysing the positive and negative aspects of mini channel-based collector. Also, the proposed invention aims at increasing the utilization of solar energy and increasing the efficiency of solar based devices.

No. of Pages : 13 No. of Claims : 5

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202441057879 A

(19) INDIA

(22) Date of filing of Application :30/07/2024

(43) Publication Date : 02/08/2024

(54) Title of the invention : ARTIFICIAL INTELLIGENCE BASED WATER PURIFICATION SYSTEM TO SUPPLY DRINKING WATER WITH RIGHT NUTRIENTS

(51) International classification :C02F0001000000, C02F0001280000, C02F0001440000, C02F0001500000, C02F0001320000

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

(87) International Publication No : NA

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

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

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Address of Applicant : NA

(72) Name of Inventor :

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(57) Abstract :

Artificial Intelligence based water purification system to supply drinking water with right nutrients is the proposed invention. The proposed invention focuses on designing a water filter that will filter of the water using the ceramic candles, one of the oldest methodologies to filter water. The ceramic candle is used such that the water is not cleaned too much, which is the major drawback of the existing water filters. The proposed water filter is designed to include the minerals, such that they can be added in required amount. This will help the water purifier users to stay away from the problems of mineral deficiency and stay healthy.

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(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :30/07/2024

(21) Application No.202441057830 A

(43) Publication Date : 02/08/2024

(54) Title of the invention : FARMER BOT FOR YIELD PREDICTION AND FERTILIZER RECOMMENDATIONS

(51) International classification	:G06N0020000000, H04L0051020000, G06N0003000000, G06N0005020000, G06N0005040000	(71) <b>Name of Applicant :</b> <b>1)S SOUNDHAR</b> Address of Applicant :ASSISTANT PROFESSOR, DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE V S B COLLEGE OF ENGINEERING TECHNICAL CAMPUS ----- <b>Name of Applicant : NA</b> <b>Address of Applicant : NA</b>
(86) International Application No Filing Date	:NA :NA	(72) <b>Name of Inventor :</b> <b>1)S Soundhar</b> Address of Applicant :Assistant Professor AI&DS V S B College of Engineering Technical Campus Coimbatore Coimbatore ----- <b>2)M Abernakumari</b> Address of Applicant :Assistant Professor,AI&DS V S B College of Engineering Technical Campus Coimbatore Coimbatore ----- <b>3)D Jeevitha</b> Address of Applicant :Assistant Professor,AI&DS V S B College of Engineering Technical Campus Coimbatore Coimbatore ----- <b>4)D S Jaya Kumari</b> Address of Applicant :Assistant Professor AI&DS V S B College of Engineering Technical Campus Coimbatore Coimbatore ----- <b>5)V MurugaLakshmi</b> Address of Applicant :Assistant Professor AI&DS V S B College of Engineering Technical Campus Coimbatore Coimbatore ----- <b>6)F Theophilus</b> Address of Applicant :Assistant Professor AI&DS V S B College of Engineering Technical Campus Coimbatore Coimbatore ----- <b>7)Dr R Murugadoss</b> Address of Applicant :Professor ,AI&DS,V S B College of Engineering Techmical Campus Coimbatore Coimbatore ----- <b>8)Dr P Venkadesh</b> Address of Applicant :Professor ,AI&DS, V S B College of Engineering Techmical Campus Coimbatore Coimbatore -----
(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 :

This study develops a chat room and a Chat-Bot to discuss the prevailing issues related to farming with peers and expertise and support farmers to make timely decision on farming. A standard set of questions was identified through discussions and surveys with farmers, expertise and other stakeholders. Intents, which the users might want to know, and examples, which the users use to explain a specific intent and entities that are different objects referring to an intent were identified from the questions. Artificial Intelligence Markup Language (AIML) was used to train a model, which predicts an intent based on the given example. The Chat-Bot was implemented in a cloud platform and therefore, the client end does not require more computational resources. Farmers loose their yield because they lack knowledge of new technologies and different parameters that help them increase their yield. Our proposed system performs machine learning analysis on all the valuable parameters required for increasing the farmers yield .We analyse the weather , season, rainfall ,and type of soil of a region and based on historic data train the system to suggest which crops to grow , and which mix crops grown together increase their yield We also answer all these farmers questions using auto-chat bot .This chat bot is NLP trained hence it learns on its own and improvises its answers .This system helps farmers in remote places where no connectivity is present to better understand the crop to be grown based on atmospheric conditions and also answer their basic questions on farming

No. of Pages : 9 No. of Claims : 5

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202541023106 A

(19) INDIA

(22) Date of filing of Application :14/03/2025

(43) Publication Date : 28/03/2025

(54) Title of the invention : Driver Somnolence & Lethargy Detection Model based on Eyes & Facial Movement using OpenCV Library

(51) International classification	:G06V0020590000, A61B0005000000, G08B0021060000, A61B0005180000, A61B0005110000	(71) Name of Applicant : <b>1)Dr. R. Murugadoss</b> Address of Applicant :Professor and Head, Artificial Intelligence and Data Science Department, ----- <b>2)Mrs.V Murugalakshmi</b> <b>3)Mrs.D S Jayakumari</b> <b>4)Ms.D Jeevitha</b> Name of Applicant : NA Address of Applicant : NA
(86) International Application No	:NA	(72) Name of Inventor : <b>1)Kumara Guru S V</b> Address of Applicant :Department of Artificial Intelligence & Data Science V S B College of Engineering Technical Campus Coimbatore ----- <b>2)Stanis Jeba J</b> Address of Applicant :Department of Artificial Intelligence & Data Science V S B College of Engineering Technical Campus Coimbatore ----- <b>3)Srivimal M</b> Address of Applicant :Department of Artificial Intelligence & Data Science V S B College of Engineering Technical Campus Coimbatore ----- <b>4)Aurlian J</b> Address of Applicant :Department of Artificial Intelligence & Data Science V S B College of Engineering Technical Campus Coimbatore -----
(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 :

Driver Somnolence, Drowsiness & Fatigue Detection Model based on Eyes & Facial Movement using OpenCV Library Abstract: Drowsiness, or excessive sleep, otherwise referred to as somnolence, and fatigue, or lethargy, severely disrupt driver alertness hence leading to accidents because of longer reaction times and lack of good judgment. Prompt and early identification of those conditions is very important in enhancing road safety. Monitoring eye activity has been suggested as an appropriate way to inspect the presence of somnolence; it is argued that several studies have pointed to the fact that such technologies and algorithms for evaluating driver alertness are potentially useful. YOLO is commonly applied to analyze facial features in real-time, whereas PERCLOS and EAR are mainly used to quantify eye closure time and blinking rates, respectively. However, these single approaches have their shortcomings, such as imposters due to variation in illumination and inability to differentiate between normal blinking and drowsiness. We, therefore, propose an end-to-end algorithm which takes the best from PERCLOS, YOLO, and EAR-based approaches while at the same time minimizing the disadvantages these approaches have. Experimental findings authenticate that our model has elevated real-time detection accuracy, decreased false-positive alerts, and provided a much more stable solution to avoid accidents caused by tired drivers. The developed system looks to have a lot of potential for large-scale implementation and saving lives in drowsiness-related accidents.

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(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :26/03/2024

(21) Application No.202441023823 A

(43) Publication Date : 05/04/2024

(54) Title of the invention : AI AND IOT BASED WATERBORNE DISEASE SURVEILLANCE FOR RAPID OUTBREAK DETECTION USING PIR SENSORS

(51) International classification :G01N0033180000, H04W0004380000, G01N0015060000, C12Q0001100000, C12Q0001682500  
(86) International Application No :NA  
Filing Date :NA  
(87) International Publication No : NA  
(61) Patent of Addition to Application Number :NA  
Filing Date :NA  
(62) Divisional to Application Number :NA  
Filing Date :NA

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Address of Applicant :Professor & Head of the Department,Department of Artificial Intelligence and Data Science, V.S.B. College of Engineering Technical Campus, Kinathukadavu, Coimbatore -642109. -----

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(51) International classification	:G06Q0050180000, G06Q0010100000, G06Q0010060000, G06F0021620000, G06Q0030020000	(71) <b>Name of Applicant :</b> <b>1)V.S.B. College of Engineering Technical Campus</b> Address of Applicant :Professor & Head of the Department, Department of Artificial Intelligence and Data Science, V.S.B. College of Engineering Technical Campus, Kinathukadavu, Coimbatore -642109. drrmdcse@gmail.com ----- <b>Name of Applicant : NA</b> <b>Address of Applicant : NA</b>
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(61) Patent of Addition to Application Number	:NA	
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(51) International classification	:H01L0027092000, C07K0016280000, G06N0003020000, H01L0023310000, C02F0001140000	(71)Name of Applicant :
(86) International Application No	:PCT//	<b>1)DR. R. MURUGADOS</b>
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(87) International Publication No	: NA	<b>2)DILIP MISHRA</b>
(61) Patent of Addition to Application Number	:NA	<b>3)DR. SANYASI NAIDU DADI</b>
Filing Date	:NA	<b>4)GLADYS JEBAKUMARI GNANADURAI</b>
(62) Divisional to Application Number	:NA	<b>5)DEEPTI AMRUT CHAUDHARI</b>
Filing Date	:NA	<b>6)MS D JEEVITHA</b>
		<b>7)VASUPALLI MANOJ</b>
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(57) Abstract :

Artificial Intelligence based approach to analyse the pros and cons of mini channel based solar collectors for effective utilization of solar energy is the proposed invention. The proposed invention focuses on analysing the positive and negative aspects of mini channel-based collector. Also, the proposed invention aims at increasing the utilization of solar energy and increasing the efficiency of solar based devices.

No. of Pages : 13 No. of Claims : 5

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202441057879 A

(19) INDIA

(22) Date of filing of Application :30/07/2024

(43) Publication Date : 02/08/2024

(54) Title of the invention : ARTIFICIAL INTELLIGENCE BASED WATER PURIFICATION SYSTEM TO SUPPLY DRINKING WATER WITH RIGHT NUTRIENTS

(51) International classification :C02F0001000000, C02F0001280000, C02F0001440000, C02F0001500000, C02F0001320000

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

(87) International Publication No : NA

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

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

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(57) Abstract :

Artificial Intelligence based water purification system to supply drinking water with right nutrients is the proposed invention. The proposed invention focuses on designing a water filter that will filter of the water using the ceramic candles, one of the oldest methodologies to filter water. The ceramic candle is used such that the water is not cleaned too much, which is the major drawback of the existing water filters. The proposed water filter is designed to include the minerals, such that they can be added in required amount. This will help the water purifier users to stay away from the problems of mineral deficiency and stay healthy.

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

(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :10/03/2025

(21) Application No.202541021597 A

(43) Publication Date : 21/03/2025

(54) Title of the invention : HYBRID AI FOR EMOTION- AWARE PERSONALIZED LEARNING

(51) International classification	:G10L0025630000, G06Q0050200000, G06V0040160000, G09B0005060000, G09B0007040000	(71) Name of Applicant : <b>1)Dr. R. Murugadoss</b> Address of Applicant :Professor and Head, Artificial Intelligence and Data Science Department, ----- <b>2)Mrs. V. Murugalakshmi</b> <b>3)Mrs. D.S.Jayakumari</b> <b>4)Mrs. G. Nithya</b> <b>5)Ms. M. Aberna Kumari</b> <b>6)Mr. S. Soundhar</b> Name of Applicant : NA Address of Applicant : NA
(86) International Application No	:NA	(72) Name of Inventor : <b>1)Ms. K. Sowmithra</b> Address of Applicant :Department of Artificial Intelligence and Data Science, V.S.B College of Engineering Technical Campus, Coimbatore. Coimbatore ----- -----
Filing Date	:NA	<b>2)Ms. K. Abinaya</b> Address of Applicant :Department of Artificial Intelligence and Data Science, V.S.B College of Engineering Technical Campus, Coimbatore. Coimbatore ----- -----
(87) International Publication No	: NA	<b>3)Ms. C.Sathyra</b> Address of Applicant :Department of Artificial Intelligence and Data Science, V.S.B College of Engineering Technical Campus, Coimbatore. Coimbatore ----- -----
(61) Patent of Addition to Application Number	:NA	
Filing Date	:NA	
(62) Divisional to Application Number	:NA	
Filing Date	:NA	

(57) Abstract :

**ABSTRACT:** The integration of Artificial Intelligence (AI) in education has opened new frontiers in personalized and adaptive learning. Traditional e-learning platforms often lack the ability to gauge student engagement, leading to passive learning experiences. This project aims to bridge this gap by utilizing multi-modal emotion recognition to analyse students' real-time emotional states, enhancing both student engagement and teacher effectiveness. Our model incorporates Convolutional Neural Networks (CNNs) for facial expression analysis, Wav2Vec for speech emotion recognition, and BERT for textual sentiment detection. These three components work together to capture emotions such as confusion, boredom, frustration, and interest, providing valuable insights into the student's learning process. The system continuously monitors these emotional cues and adjusts teaching methods accordingly to maintain an optimal learning experience. One major application of this project is in AI driven tutoring systems, where virtual tutors can modify their teaching pace, tone, and style based on a student's emotional feedback. If signs of stress or confusion are detected during an assessment, the AI can suggest personalized revision topics or provide simplified explanations to reinforce understanding. Additionally, teachers receive real-time reports on student engagement levels, helping them identify struggling learners and adapt lesson plans more effectively. By implementing emotion-aware learning, this system makes online education more interactive, engaging, and human-like. It fosters a more inclusive and adaptive educational environment, ensuring that students receive the necessary support to enhance their comprehension and academic performance. This innovative approach transforms digital learning into a more intuitive and student centred experience, paving the way for the future of AI-driven education.

No. of Pages : 11 No. of Claims : 10

(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :30/07/2024

(21) Application No.202441057830 A

(43) Publication Date : 02/08/2024

(54) Title of the invention : FARMER BOT FOR YIELD PREDICTION AND FERTILIZER RECOMMENDATIONS

(51) International classification	:G06N0020000000, H04L0051020000, G06N0003000000, G06N0005020000, G06N0005040000	(71) <b>Name of Applicant :</b> <b>1)S SOUNDHAR</b> Address of Applicant :ASSISTANT PROFESSOR, DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE V S B COLLEGE OF ENGINEERING TECHNICAL CAMPUS ----- <b>Name of Applicant : NA</b> <b>Address of Applicant : NA</b>
(86) International Application No Filing Date	:NA :NA	(72) <b>Name of Inventor :</b> <b>1)S Soundhar</b> Address of Applicant :Assistant Professor AI&DS V S B College of Engineering Technical Campus Coimbatore Coimbatore ----- <b>2)M Abernakumari</b> Address of Applicant :Assistant Professor,AI&DS V S B College of Engineering Technical Campus Coimbatore Coimbatore ----- <b>3)D Jeevitha</b> Address of Applicant :Assistant Professor,AI&DS V S B College of Engineering Technical Campus Coimbatore Coimbatore ----- <b>4)D S Jaya Kumari</b> Address of Applicant :Assistant Professor AI&DS V S B College of Engineering Technical Campus Coimbatore Coimbatore ----- <b>5)V MurugaLakshmi</b> Address of Applicant :Assistant Professor AI&DS V S B College of Engineering Technical Campus Coimbatore Coimbatore ----- <b>6)F Theophilus</b> Address of Applicant :Assistant Professor AI&DS V S B College of Engineering Technical Campus Coimbatore Coimbatore ----- <b>7)Dr R Murugadoss</b> Address of Applicant :Professor ,AI&DS,V S B College of Engineering Techmical Campus Coimbatore Coimbatore ----- <b>8)Dr P Venkadesh</b> Address of Applicant :Professor ,AI&DS, V S B College of Engineering Techmical Campus Coimbatore Coimbatore -----
(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 :

This study develops a chat room and a Chat-Bot to discuss the prevailing issues related to farming with peers and expertise and support farmers to make timely decision on farming. A standard set of questions was identified through discussions and surveys with farmers, expertise and other stakeholders. Intents, which the users might want to know, and examples, which the users use to explain a specific intent and entities that are different objects referring to an intent were identified from the questions. Artificial Intelligence Markup Language (AIML) was used to train a model, which predicts an intent based on the given example. The Chat-Bot was implemented in a cloud platform and therefore, the client end does not require more computational resources. Farmers loose their yield because they lack knowledge of new technologies and different parameters that help them increase their yield. Our proposed system performs machine learning analysis on all the valuable parameters required for increasing the farmers yield .We analyse the weather , season, rainfall ,and type of soil of a region and based on historic data train the system to suggest which crops to grow , and which mix crops grown together increase their yield We also answer all these farmers questions using auto-chat bot .This chat bot is NLP trained hence it learns on its own and improvises its answers .This system helps farmers in remote places where no connectivity is present to better understand the crop to be grown based on atmospheric conditions and also answer their basic questions on farming

No. of Pages : 9 No. of Claims : 5

(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :23/07/2025

(21) Application No.202541070309 A

(43) Publication Date : 01/08/2025

(54) Title of the invention : "Next-Generation Cloud Architectures for Large-Scale Generative AI Systems"

(51) International classification	:G06F0009500000, G06F0021620000, G06N0003063000, G06N0003045000, G06F0009455000	(71)Name of Applicant : <b>1)MURUGALAKSHMI k</b> Address of Applicant :Assistant Professor, Department of Artificial Intelligence and Data Science, VSB College of Engineering Technical Campus, Kinathukadavu. ----- <b>2)Dr. R. Murugadoss</b> <b>3)Mrs. D.S. Jayakumari</b> <b>4)Ms. D.Jeevitha</b> <b>5)Mrs. B. Jebaranjanji</b> <b>6)Mr. S. Soundhar</b> <b>7)Mr. F. Theophilus</b> <b>8)Mrs. G. Nithya</b> <b>9)Ms. G. Yogapriya</b> Name of Applicant : NA Address of Applicant : NA
(86) International Application No	:NA	(72)Name of Inventor : <b>1)MURUGALAKSHMI k</b> Address of Applicant :Assistant Professor, Department of Artificial Intelligence and Data Science, VSB College of Engineering Technical Campus, Kinathukadavu. ----- <b>2)Dr. R. Murugadoss</b> Address of Applicant :Professor, Department of AI & DS, V.S.B College of Engineering and Technical Campus, Coimbatore Coimbatore -----
(87) International Publication No	: NA	<b>3)Mrs. D.S. Jayakumari</b> Address of Applicant :Assistant Professor, Department of AI & DS, V.S.B College of Engineering and Technical Campus, Coimbatore coimbatore -----
(61) Patent of Addition to Application Number	:NA	<b>4)Ms. D.Jeevitha</b> Address of Applicant :Assistant Professor, Department of AI & DS, V.S.B College of Engineering and Technical Campus, Coimbatore coimbatore -----
Filing Date	:NA	<b>5)Mrs. B. Jebaranjanji</b> Address of Applicant :Assistant Professor, Department of AI & DS, V.S.B College of Engineering and Technical Campus, Coimbatore coimbatore -----
(62) Divisional to Application Number	:NA	<b>6)Mr. S. Soundhar</b> Address of Applicant :Assistant Professor, Department of AI & DS, V.S.B College of Engineering and Technical Campus, Coimbatore coimbatore -----
Filing Date	:NA	<b>7)Mr. F. Theophilus</b> Address of Applicant :Assistant Professor, Department of AI & DS, V.S.B College of Engineering and Technical Campus, Coimbatore coimbatore -----
		<b>8)Mrs. G. Nithya</b> Address of Applicant :Assistant Professor, Department of AI & DS, V.S.B College of Engineering and Technical Campus, Coimbatore coimbatore -----
		<b>9)Ms. G. Yogapriya</b> Address of Applicant :Assistant Professor, Department of AI & DS, V.S.B College of Engineering and Technical Campus, Coimbatore coimbatore -----

(57) Abstract :

Abstract The rapid evolution of generative AI systems—such as large language models (LLMs), diffusion models, and multi-modal transformers—demands a fundamental rethinking of cloud architectures to meet the scale, latency, security, and efficiency requirements of modern workloads. This paper explores next-generation cloud architectures designed to support large-scale generative AI systems. It presents a layered framework that integrates heterogeneous computing (GPUs, TPUs, FPGAs), high-throughput networking, advanced memory hierarchies, and disaggregated storage. The architecture leverages innovations in distributed training, model parallelism, and elastic inference serving, orchestrated via AI-native platforms such as Kubernetes with custom scheduling and autoscaling policies. Moreover, it addresses critical challenges in energy efficiency, cost optimization, and compliance with data privacy regulations through federated and edge-cloud hybrid deployments. We also examine the role of AI accelerators, service meshes, serverless AI pipelines, and zero-trust security models in enabling reliable, real-time AI model delivery. The proposed architectures aim to provide scalable, resilient, and sustainable infrastructure foundations for the future of generative AI in industries ranging from healthcare and finance to autonomous systems and creative content generation.

No. of Pages : 9 No. of Claims : 10

(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :30/07/2024

(21) Application No.202441057830 A

(43) Publication Date : 02/08/2024

(54) Title of the invention : FARMER BOT FOR YIELD PREDICTION AND FERTILIZER RECOMMENDATIONS

(51) International classification	:G06N0020000000, H04L0051020000, G06N0003000000, G06N0005020000, G06N0005040000	(71) <b>Name of Applicant :</b> <b>1)S SOUNDHAR</b> Address of Applicant :ASSISTANT PROFESSOR, DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE V S B COLLEGE OF ENGINEERING TECHNICAL CAMPUS ----- <b>Name of Applicant : NA</b> <b>Address of Applicant : NA</b>
(86) International Application No Filing Date	:NA :NA	(72) <b>Name of Inventor :</b> <b>1)S Soundhar</b> Address of Applicant :Assistant Professor AI&DS V S B College of Engineering Technical Campus Coimbatore Coimbatore ----- <b>2)M Abernakumari</b> Address of Applicant :Assistant Professor,AI&DS V S B College of Engineering Technical Campus Coimbatore Coimbatore ----- <b>3)D Jeevitha</b> Address of Applicant :Assistant Professor,AI&DS V S B College of Engineering Technical Campus Coimbatore Coimbatore ----- <b>4)D S Jaya Kumari</b> Address of Applicant :Assistant Professor AI&DS V S B College of Engineering Technical Campus Coimbatore Coimbatore ----- <b>5)V MurugaLakshmi</b> Address of Applicant :Assistant Professor AI&DS V S B College of Engineering Technical Campus Coimbatore Coimbatore ----- <b>6)F Theophilus</b> Address of Applicant :Assistant Professor AI&DS V S B College of Engineering Technical Campus Coimbatore Coimbatore ----- <b>7)Dr R Murugadoss</b> Address of Applicant :Professor ,AI&DS,V S B College of Engineering Techmical Campus Coimbatore Coimbatore ----- <b>8)Dr P Venkadesh</b> Address of Applicant :Professor ,AI&DS, V S B College of Engineering Techmical Campus Coimbatore Coimbatore -----
(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 :

This study develops a chat room and a Chat-Bot to discuss the prevailing issues related to farming with peers and expertise and support farmers to make timely decision on farming. A standard set of questions was identified through discussions and surveys with farmers, expertise and other stakeholders. Intents, which the users might want to know, and examples, which the users use to explain a specific intent and entities that are different objects referring to an intent were identified from the questions. Artificial Intelligence Markup Language (AIML) was used to train a model, which predicts an intent based on the given example. The Chat-Bot was implemented in a cloud platform and therefore, the client end does not require more computational resources. Farmers loose their yield because they lack knowledge of new technologies and different parameters that help them increase their yield. Our proposed system performs machine learning analysis on all the valuable parameters required for increasing the farmers yield .We analyse the weather , season, rainfall ,and type of soil of a region and based on historic data train the system to suggest which crops to grow , and which mix crops grown together increase their yield We also answer all these farmers questions using auto-chat bot .This chat bot is NLP trained hence it learns on its own and improvises its answers .This system helps farmers in remote places where no connectivity is present to better understand the crop to be grown based on atmospheric conditions and also answer their basic questions on farming

No. of Pages : 9 No. of Claims : 5

(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :03/02/2025

(21) Application No.202541008630 A

(43) Publication Date : 14/02/2025

(54) Title of the invention : Improving Customer Loyalty with Machine Learning: A Review of Churn Prediction Models

(51) International classification	:G06N002000000, G06Q0030020200, G06Q0030020000, G06N0003088000, G06N0003045000	(71) Name of Applicant : 1)Dr. R. Murugadoss Address of Applicant :Professor and Head, Artificial Intelligence and Data Science Department, ----- Name of Applicant : NA Address of Applicant : NA
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(62) Divisional to Application Number	:NA	6)Mr. S. ASHWIN Address of Applicant :DEPARTMENT OF AI & DS, V.S.B COLLEGE OF ENGINEERING AND TECHNICAL CAMPUS, COIMBATORE. COIMBATORE -----
Filing Date	:NA	7)Mr. S. IYYAPPAN Address of Applicant :DEPARTMENT OF AI & DS, V.S.B COLLEGE OF ENGINEERING AND TECHNICAL CAMPUS, COIMBATORE. COIMBATORE -----

(57) Abstract :

Customer retention is a critical factor in business success, as acquiring new customers is often more costly than retaining existing ones. With the rise of data-driven decision-making, machine learning (ML) has emerged as a powerful tool for predicting customer churn and enhancing loyalty strategies. This paper provides a comprehensive review of machine learning methods used for churn prediction, examining their effectiveness, advantages, and limitations. We explore various supervised and unsupervised learning techniques, including decision trees, neural networks, support vector machines, and ensemble models, as well as deep learning approaches. Additionally, we discuss key factors influencing customer churn and how businesses can leverage ML insights to implement proactive retention strategies. The paper also highlights challenges in data quality, model interpretability, and ethical considerations. Finally, we provide recommendations for business practitioners to effectively apply ML-based churn prediction models for improved customer loyalty and long-term business growth.

No. of Pages : 13 No. of Claims : 10

(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :28/01/2025

(21) Application No.202511006946 A

(43) Publication Date : 14/02/2025

(54) Title of the invention : MACHINE LEARNING VOICE ASSISTED MEDICAL DEVICE

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7) Dr. T. Priya

8) Ms. Alafia J

9) Dr. S Chandrasekaran

10) Dr. R. Murugadoss

Name of Applicant : NA

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(72) Name of Inventor :

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(57) Abstract :

The invention features a machine learning-powered, voiced-assistant medical device to generate a better experience for interaction from healthcare professionals to medical systems. Utilizing cutting-edge technology, the device combines state-of-the-art voice recognition capabilities with natural language processing (NLP) and machine learning techniques to accurately interpret and respond to medical queries in real time. It enables healthcare providers to issue voice commands to operate medical equipment, retrieve patient data and receive decision-support guidance informed by a patient's condition, medical history and real-time sensor data. It can also accurately process specialized medical terminology, handle noisy environments via noise cancellation, and generate dynamic, context-aware responses. Moreover, the system is configured for multilingual support and can be easily integrated into most existing healthcare infrastructures, allowing for wide applicability in various clinical environments.

No. of Pages : 22 No. of Claims : 10

(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :26/03/2024

(21) Application No.202441023823 A

(43) Publication Date : 05/04/2024

(54) Title of the invention : AI AND IOT BASED WATERBORNE DISEASE SURVEILLANCE FOR RAPID OUTBREAK DETECTION USING PIR SENSORS

(51) International classification :G01N0033180000, H04W0004380000, G01N0015060000, C12Q0001100000, C12Q0001682500  
(86) International Application No :NA  
Filing Date :NA  
(87) International Publication No : NA  
(61) Patent of Addition to Application Number :NA  
Filing Date :NA  
(62) Divisional to Application Number :NA  
Filing Date :NA

(71)Name of Applicant :

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(72)Name of Inventor :

1)R.Murugadoss

Address of Applicant :Professor & Head of the Department,Department of Artificial Intelligence and Data Science, V.S.B. College of Engineering Technical Campus, Kinathukadavu, Coimbatore -642109. -----

(57) Abstract :

This methodology investigates the possibility of using modified PIR sensors in conjunction with AI and IoT for microbe detection in small heated water samples. Small, high—sensitivity PIR sensors (modified for potentially improved sensitivity) would be used alongside a microcontroller board, data acquisition system, and AI software. Water samples with varying microbe concentrations would be heated to a specific temperature. The sensor would continuously record data while the AI model is trained on prepossessed sensor data labeled with microbe concentration. The trained model would then analyze data from new samples with unknown microbe concentrations, aiming to detect and estimate microbe presence based on the sensor data. An IoT platform could be integrated for remote monitoring, data visualization, and real-time alerts based on the AI model's predictions. This approach explores the potential of sensor technology and AI applications in microbe detection, but challenges 'include sensor limitations, data complexity, and real-world applicability. This approach presents an exciting exploration at the intersection of sensor technology and AI applications in microbe detection. However, it's crucial to acknowledge the challenges. The limitations of the modified PIR sensors themselves come into play, as they might not be sensitive enough to capture the subtle thermal changes caused by microbes. Additionally, extracting meaningful data from the sensor readings amidst background noise and temperature fluctuations could pose a significant challenge for the AI model. Finally, the real-world applicability of this approach in environments with diverse water compositions and microbe types remains uncertain. Despite these limitations, this methodology offers a valuable thought experiment, pushing the boundaries of what's possible in microbe detection.

No. of Pages : 7 No. of Claims : 4

(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :26/03/2024

(21) Application No.202441023831 A

(43) Publication Date : 05/04/2024

(54) Title of the invention : AI AND CHATBOT BASED DIGITAL PLATFORM FOR LAND AND FOREST RIGHTS AWARENESS AND SUPPORT FOR ST COMMUN

(51) International classification	:G06Q0050180000, G06Q0010100000, G06Q0010060000, G06F0021620000, G06Q0030020000	(71) <b>Name of Applicant :</b> <b>1)V.S.B. College of Engineering Technical Campus</b> Address of Applicant :Professor & Head of the Department, Department of Artificial Intelligence and Data Science, V.S.B. College of Engineering Technical Campus, Kinathukadavu, Coimbatore -642109. drrmdcse@gmail.com ----- <b>Name of Applicant : NA</b> <b>Address of Applicant : NA</b>
(86) International Application No	:NA	
Filing Date	:NA	
(87) International Publication No	: NA	<b>(72)Name of Inventor :</b> <b>1)Dr.R.Murugadoss</b> Address of Applicant :V.S.B. College of Engineering Technical Campus, Kinathukadavu, Coimbatore -642109. drrmdcse@gmail.com -----
(61) Patent of Addition to Application Number	:NA	
Filing Date	:NA	
(62) Divisional to Application Number	:NA	
Filing Date	:NA	

(57) Abstract :

AI and Chatbot based Digital Platform for Land and Forest Rights Awareness and Support for ST Communities \*Abstract: Scheduled Tribe (ST) communities often face challenges in understanding and asserting their land and forest rights. An AI-powered digital platform can bridge this gap by providing accessible and culturally relevant information. This platform would feature a multilingual Chatbot, allowing users to ask questions about land rights acts, grievance procedures, and entitlements in their native language. Easy-to-understand explainer videos, infographics, and downloadable booklets would further clarify complex legal concepts. Interactive modules like quizzes and simulations would make learning engaging. Beyond information, the platform would empower communities through a multilingual helpline with human experts to address specific situations. A safe online forum would foster peer support and knowledge sharing. A comprehensive legal aid directory would connect users with lawyers specializing in tribal land rights. Accessibility is key: the platform would function offline for areas with limited internet, and a voice interface would cater to users with low literacy or visual impairments. Partnerships with NGOs and local organizations would ensure outreach and training sessions using the platform. Robust data security measures would protect user privacy, particularly regarding sensitive land ownership information; The platform would be available in multiple local languages, recognizing the diverse linguistic needs of ST communities. Finally, a long-term plan for maintenance, content updates, and staff training would ensure the platform's continued effectiveness in empowering ST communities to claim their rightful ownership of land and forest resources.

No. of Pages : 7 No. of Claims : 5

(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :15/10/2022

(21) Application No.202241058952 A

(43) Publication Date : 18/11/2022

(54) Title of the invention : ARTIFICIAL INTELLIGENCE BASED APPROACH TO ANALYSE THE PROS AND CONS OF MINI CHANNEL BASED SOLAR COLLECTORS FOR EFFECTIVE UTILIZATION OF SOLAR ENERGY

(51) International classification	:H01L0027092000, C07K0016280000, G06N0003020000, H01L0023310000, C02F0001140000	(71)Name of Applicant :
(86) International Application No	:PCT//	<b>1)DR. R. MURUGADOS</b>
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(87) International Publication No	: NA	<b>2)DILIP MISHRA</b>
(61) Patent of Addition to Application Number	:NA	<b>3)DR. SANYASI NAIDU DADI</b>
Filing Date	:NA	<b>4)GLADYS JEBAKUMARI GNANADURAI</b>
(62) Divisional to Application Number	:NA	<b>5)DEEPTI AMRUT CHAUDHARI</b>
Filing Date	:NA	<b>6)MS D JEEVITHA</b>
		<b>7)VASUPALLI MANOJ</b>
		<b>8)S ARUN KUMAR</b>
		<b>9)AAKULA SWATHI</b>
		<b>10)RAHUL SINGH</b>
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		Address of Applicant :NA
		(72)Name of Inventor :
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		<b>2)DILIP MISHRA</b>
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		<b>3)DR. SANYASI NAIDU DADI</b>
		Address of Applicant :SOFTWARE ENGINNER, HOUSE NO LIG 113, HB COLONY, SEETAMADARA, BESIDE SIVAAALAYAM, VISAKHAPATNAM, PIN - 530022, ANDHRA PRADESH. INDIA. VISAKHAPATNAM -----
		<b>4)GLADYS JEBAKUMARI GNANADURAI</b>
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		<b>5)DEEPTI AMRUT CHAUDHARI</b>
		Address of Applicant :ASSISTANT PROFESSOR DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING, B 501, PRIME SQUARE, NEAR ROSELAND RESIDENCY, KUNAL ICON RIAD, PIMPLE SAUDAGAR, PUNE- 411027 MAHARASHTRA. INDIA. PUNE -----
		<b>6)MS D JEEVITHA</b>
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		<b>7)VASUPALLI MANOJ</b>
		Address of Applicant :ASSISTANT PROFESSOR, DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING, GMR INSTITUTE OF TECHNOLOGY, GMR NAGAR, RAJAM, VIZIANAGARAM DISTRICT – 532127, ANDHRA PRADESH, INDIA. RAJAM -----
		<b>8)S ARUN KUMAR</b>
		Address of Applicant :ASSISTANT PROFESSOR, INFORMATION TECHNOLOGY, VSB COLLEGE OF ENGINEERING TECHNICAL CAMPUS, COIMBATORE, SOLAVAMPALAYAM, COIMBATORE, TAMIL NADU - 642109. INDIA. SOLAVAMPALAYAM -----
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		<b>10)RAHUL SINGH</b>
		Address of Applicant :HEAD OF DEPARTMENT-ASST. PROFESSOR (PHYSICS), N.B.G.S.M. COLLEGE, GURUGRAM UNIVERSITY, HARYANA - 122003. INDIA GURUGRAM -----

(57) Abstract :

Artificial Intelligence based approach to analyse the pros and cons of mini channel based solar collectors for effective utilization of solar energy is the proposed invention. The proposed invention focuses on analysing the positive and negative aspects of mini channel-based collector. Also, the proposed invention aims at increasing the utilization of solar energy and increasing the efficiency of solar based devices.

No. of Pages : 13 No. of Claims : 5

(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :30/07/2024

(21) Application No.202441057879 A

(43) Publication Date : 02/08/2024

(54) Title of the invention : ARTIFICIAL INTELLIGENCE BASED WATER PURIFICATION SYSTEM TO SUPPLY DRINKING WATER WITH RIGHT NUTRIENTS

(51) International classification :C02F0001000000, C02F0001280000, C02F0001440000, C02F0001500000, C02F0001320000

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

(87) International Publication No : NA

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

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

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2)Dr. D. SHAMIA

Name of Applicant : NA

Address of Applicant : NA

(72) Name of Inventor :

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(57) Abstract :

Artificial Intelligence based water purification system to supply drinking water with right nutrients is the proposed invention. The proposed invention focuses on designing a water filter that will filter of the water using the ceramic candles, one of the oldest methodologies to filter water. The ceramic candle is used such that the water is not cleaned too much, which is the major drawback of the existing water filters. The proposed water filter is designed to include the minerals, such that they can be added in required amount. This will help the water purifier users to stay away from the problems of mineral deficiency and stay healthy.

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

(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :30/07/2024

(21) Application No.202441057830 A

(43) Publication Date : 02/08/2024

(54) Title of the invention : FARMER BOT FOR YIELD PREDICTION AND FERTILIZER RECOMMENDATIONS

(51) International classification	:G06N0020000000, H04L0051020000, G06N0003000000, G06N0005020000, G06N0005040000	(71) <b>Name of Applicant :</b> <b>1)S SOUNDHAR</b> Address of Applicant :ASSISTANT PROFESSOR, DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE V S B COLLEGE OF ENGINEERING TECHNICAL CAMPUS ----- <b>Name of Applicant : NA</b> <b>Address of Applicant : NA</b>
(86) International Application No Filing Date	:NA :NA	(72) <b>Name of Inventor :</b> <b>1)S Soundhar</b> Address of Applicant :Assistant Professor AI&DS V S B College of Engineering Technical Campus Coimbatore Coimbatore ----- <b>2)M Abernakumari</b> Address of Applicant :Assistant Professor,AI&DS V S B College of Engineering Technical Campus Coimbatore Coimbatore ----- <b>3)D Jeevitha</b> Address of Applicant :Assistant Professor,AI&DS V S B College of Engineering Technical Campus Coimbatore Coimbatore ----- <b>4)D S Jaya Kumari</b> Address of Applicant :Assistant Professor AI&DS V S B College of Engineering Technical Campus Coimbatore Coimbatore ----- <b>5)V MurugaLakshmi</b> Address of Applicant :Assistant Professor AI&DS V S B College of Engineering Technical Campus Coimbatore Coimbatore ----- <b>6)F Theophilus</b> Address of Applicant :Assistant Professor AI&DS V S B College of Engineering Technical Campus Coimbatore Coimbatore ----- <b>7)Dr R Murugadoss</b> Address of Applicant :Professor ,AI&DS,V S B College of Engineering Techmical Campus Coimbatore Coimbatore ----- <b>8)Dr P Venkadesh</b> Address of Applicant :Professor ,AI&DS, V S B College of Engineering Techmical Campus Coimbatore Coimbatore -----
(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 :

This study develops a chat room and a Chat-Bot to discuss the prevailing issues related to farming with peers and expertise and support farmers to make timely decision on farming. A standard set of questions was identified through discussions and surveys with farmers, expertise and other stakeholders. Intents, which the users might want to know, and examples, which the users use to explain a specific intent and entities that are different objects referring to an intent were identified from the questions. Artificial Intelligence Markup Language (AIML) was used to train a model, which predicts an intent based on the given example. The Chat-Bot was implemented in a cloud platform and therefore, the client end does not require more computational resources. Farmers loose their yield because they lack knowledge of new technologies and different parameters that help them increase their yield. Our proposed system performs machine learning analysis on all the valuable parameters required for increasing the farmers yield .We analyse the weather , season, rainfall ,and type of soil of a region and based on historic data train the system to suggest which crops to grow , and which mix crops grown together increase their yield We also answer all these farmers questions using auto-chat bot .This chat bot is NLP trained hence it learns on its own and improvises its answers .This system helps farmers in remote places where no connectivity is present to better understand the crop to be grown based on atmospheric conditions and also answer their basic questions on farming

No. of Pages : 9 No. of Claims : 5

(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :26/03/2024

(21) Application No.202441023823 A

(43) Publication Date : 05/04/2024

(54) Title of the invention : AI AND IOT BASED WATERBORNE DISEASE SURVEILLANCE FOR RAPID OUTBREAK DETECTION USING PIR SENSORS

(51) International classification :G01N0033180000, H04W0004380000, G01N0015060000, C12Q0001100000, C12Q0001682500  
(86) International Application No :NA  
Filing Date :NA  
(87) International Publication No : NA  
(61) Patent of Addition to Application Number :NA  
Filing Date :NA  
(62) Divisional to Application Number :NA  
Filing Date :NA

(71)Name of Applicant :

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Name of Applicant : NA

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(72)Name of Inventor :

1)R.Murugadoss

Address of Applicant :Professor & Head of the Department,Department of Artificial Intelligence and Data Science, V.S.B. College of Engineering Technical Campus, Kinathukadavu, Coimbatore -642109. -----

(57) Abstract :

This methodology investigates the possibility of using modified PIR sensors in conjunction with AI and IoT for microbe detection in small heated water samples. Small, high—sensitivity PIR sensors (modified for potentially improved sensitivity) would be used alongside a microcontroller board, data acquisition system, and AI software. Water samples with varying microbe concentrations would be heated to a specific temperature. The sensor would continuously record data while the AI model is trained on prepossessed sensor data labeled with microbe concentration. The trained model would then analyze data from new samples with unknown microbe concentrations, aiming to detect and estimate microbe presence based on the sensor data. An IoT platform could be integrated for remote monitoring, data visualization, and real-time alerts based on the AI model's predictions. This approach explores the potential of sensor technology and AI applications in microbe detection, but challenges 'include sensor limitations, data complexity, and real-world applicability. This approach presents an exciting exploration at the intersection of sensor technology and AI applications in microbe detection. However, it's crucial to acknowledge the challenges. The limitations of the modified PIR sensors themselves come into play, as they might not be sensitive enough to capture the subtle thermal changes caused by microbes. Additionally, extracting meaningful data from the sensor readings amidst background noise and temperature fluctuations could pose a significant challenge for the AI model. Finally, the real-world applicability of this approach in environments with diverse water compositions and microbe types remains uncertain. Despite these limitations, this methodology offers a valuable thought experiment, pushing the boundaries of what's possible in microbe detection.

No. of Pages : 7 No. of Claims : 4

(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :26/03/2024

(21) Application No.202441023831 A

(43) Publication Date : 05/04/2024

(54) Title of the invention : AI AND CHATBOT BASED DIGITAL PLATFORM FOR LAND AND FOREST RIGHTS AWARENESS AND SUPPORT FOR ST COMMUN

(51) International classification	:G06Q0050180000, G06Q0010100000, G06Q0010060000, G06F0021620000, G06Q0030020000	(71) <b>Name of Applicant :</b> <b>1)V.S.B. College of Engineering Technical Campus</b> Address of Applicant :Professor & Head of the Department, Department of Artificial Intelligence and Data Science, V.S.B. College of Engineering Technical Campus, Kinathukadavu, Coimbatore -642109. drrmdcse@gmail.com ----- <b>Name of Applicant : NA</b> <b>Address of Applicant : NA</b>
(86) International Application No	:NA	
Filing Date	:NA	
(87) International Publication No	: NA	<b>(72)Name of Inventor :</b> <b>1)Dr.R.Murugadoss</b> Address of Applicant :V.S.B. College of Engineering Technical Campus, Kinathukadavu, Coimbatore -642109. drrmdcse@gmail.com -----
(61) Patent of Addition to Application Number	:NA	
Filing Date	:NA	
(62) Divisional to Application Number	:NA	
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(57) Abstract :

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No. of Pages : 7 No. of Claims : 5

(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :15/10/2022

(21) Application No.202241058952 A

(43) Publication Date : 18/11/2022

(54) Title of the invention : ARTIFICIAL INTELLIGENCE BASED APPROACH TO ANALYSE THE PROS AND CONS OF MINI CHANNEL BASED SOLAR COLLECTORS FOR EFFECTIVE UTILIZATION OF SOLAR ENERGY

(51) International classification	:H01L0027092000, C07K0016280000, G06N0003020000, H01L0023310000, C02F0001140000	(71)Name of Applicant :
(86) International Application No	:PCT//	<b>1)DR. R. MURUGADOS</b>
Filing Date	:01/01/1900	Address of Applicant :PROFESSOR, DEPARTMENT OF CSE, V. S. B COLLEGE OF ENGINEERING TECHNICAL CAMPUS, KINATHUKADAVU, COIMBATORE- 642109, TAMILNADU. INDIA. COIMBATORE -----
(87) International Publication No	: NA	<b>2)DILIP MISHRA</b>
(61) Patent of Addition to Application Number	:NA	<b>3)DR. SANYASI NAIDU DADI</b>
Filing Date	:NA	<b>4)GLADYS JEBAKUMARI GNANADURAI</b>
(62) Divisional to Application Number	:NA	<b>5)DEEPTI AMRUT CHAUDHARI</b>
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		<b>7)VASUPALLI MANOJ</b>
		<b>8)S ARUN KUMAR</b>
		<b>9)AAKULA SWATHI</b>
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		<b>6)MS D JEEVITHA</b>
		Address of Applicant :ASSISTANT PROFESSOR, DEPARTMENT OF INFORMATION TECHNOLOGY, V. S. B COLLEGE OF ENGINEERING TECHNICAL CAMPUS, SOLAVAMPALAYAM, COIMBATORE, TAMIL NADU - 642109. INDIA. SOLAVAMPALAYAM -----
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(57) Abstract :

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No. of Pages : 13 No. of Claims : 5

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202441057879 A

(19) INDIA

(22) Date of filing of Application :30/07/2024

(43) Publication Date : 02/08/2024

(54) Title of the invention : ARTIFICIAL INTELLIGENCE BASED WATER PURIFICATION SYSTEM TO SUPPLY DRINKING WATER WITH RIGHT NUTRIENTS

(51) International classification :C02F0001000000, C02F0001280000, C02F0001440000, C02F0001500000, C02F0001320000

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

(87) International Publication No : NA

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

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

(71) Name of Applicant :

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2)Dr. D. SHAMIA

Name of Applicant : NA  
Address of Applicant : NA

(72) Name of Inventor :

1)Dr. R. MURUGADOSS

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Address of Applicant :PROFESSOR DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING V.S.B. COLLEGE OF ENGINEERING TECHNICAL CAMPUS KINATHUKADAVU COIMBATORE - 642109 TAMILNADU COIMBATORE -----

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

(12) PATENT APPLICATION PUBLICATION

(19) INDIA

(22) Date of filing of Application :10/03/2025

(21) Application No.202541021597 A

(43) Publication Date : 21/03/2025

(54) Title of the invention : HYBRID AI FOR EMOTION- AWARE PERSONALIZED LEARNING

(51) International classification	:G10L0025630000, G06Q0050200000, G06V0040160000, G09B0005060000, G09B0007040000	(71) Name of Applicant : <b>1)Dr. R. Murugadoss</b> Address of Applicant :Professor and Head, Artificial Intelligence and Data Science Department, ----- <b>2)Mrs. V. Murugalakshmi</b> <b>3)Mrs. D.S.Jayakumari</b> <b>4)Mrs. G. Nithya</b> <b>5)Ms. M. Aberna Kumari</b> <b>6)Mr. S. Soundhar</b> Name of Applicant : NA Address of Applicant : NA
(86) International Application No	:NA	(72) Name of Inventor : <b>1)Ms. K. Sowmithra</b> Address of Applicant :Department of Artificial Intelligence and Data Science, V.S.B College of Engineering Technical Campus, Coimbatore. Coimbatore ----- -----
Filing Date	:NA	<b>2)Ms. K. Abinaya</b> Address of Applicant :Department of Artificial Intelligence and Data Science, V.S.B College of Engineering Technical Campus, Coimbatore. Coimbatore ----- -----
(87) International Publication No	: NA	<b>3)Ms. C.Sathyra</b> Address of Applicant :Department of Artificial Intelligence and Data Science, V.S.B College of Engineering Technical Campus, Coimbatore. Coimbatore ----- -----
(61) Patent of Addition to Application Number	:NA	
Filing Date	:NA	
(62) Divisional to Application Number	:NA	
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(57) Abstract :

**ABSTRACT:** The integration of Artificial Intelligence (AI) in education has opened new frontiers in personalized and adaptive learning. Traditional e-learning platforms often lack the ability to gauge student engagement, leading to passive learning experiences. This project aims to bridge this gap by utilizing multi-modal emotion recognition to analyse students' real-time emotional states, enhancing both student engagement and teacher effectiveness. Our model incorporates Convolutional Neural Networks (CNNs) for facial expression analysis, Wav2Vec for speech emotion recognition, and BERT for textual sentiment detection. These three components work together to capture emotions such as confusion, boredom, frustration, and interest, providing valuable insights into the student's learning process. The system continuously monitors these emotional cues and adjusts teaching methods accordingly to maintain an optimal learning experience. One major application of this project is in AI driven tutoring systems, where virtual tutors can modify their teaching pace, tone, and style based on a student's emotional feedback. If signs of stress or confusion are detected during an assessment, the AI can suggest personalized revision topics or provide simplified explanations to reinforce understanding. Additionally, teachers receive real-time reports on student engagement levels, helping them identify struggling learners and adapt lesson plans more effectively. By implementing emotion-aware learning, this system makes online education more interactive, engaging, and human-like. It fosters a more inclusive and adaptive educational environment, ensuring that students receive the necessary support to enhance their comprehension and academic performance. This innovative approach transforms digital learning into a more intuitive and student centred experience, paving the way for the future of AI-driven education.

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