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2021

1st IEEE International Conference on Artificial Intelligence & Machine Vision

24th - 26th September, 2021
PDEU, Gandhinagar, Gujarat



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Volume Editors

Dr. Samir Patel

Dr. Santosh Kumar Bharti

Dr. Rajeev Kumar Gupta



PDEU PANDIT
DEENDAYAL
ENERGY
UNIVERSITY

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Three day International Symposium titled as "1st International Conference on Artificial Intelligence and Machine Vision (AIMV) 2021", September 24 – 26, 2021

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Convener

Dr. Samir Patel

Co-convener

Dr. Santosh Kumar Bharti

Volume Editors

Dr. Samir Patel

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Dr. Rajeev Gupta

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Welcome Note from the Organizers

On behalf of the programme committee, we would like to warmly welcome all of the great scientists, academicians, young researchers, and students from all over the world to the 1st IEEE International conference on **Artificial Intelligence and Machine Vision (AIMV-2021)** during **24-26th September, 2021** at Department of Computer Science and Engineering, School of Technology, Pandit Deendayal Energy University, Gandhinagar, Gujarat, India.

We are delighted and honored to have **Prof. Sharatkumar K. Patra (Director IIIT Vadodara, Gujarat, India)** as our chief guest and is also a matter of pride and immense pleasure to have **Prof. Maniklal Das (DA-IICT, Gandhinagar, India and Chairman-IEEE Gujarat Section)** as our Guest of Honor to this memoir of our 1st IEEE International conference **AIMV-2021**.

We also have plethora of well-known researchers who have placed a remarkable mark in their respective field such as **Dr. Korhan Cengiz** (Assistant Professor at Trakya University, Turkey), **Dr. Avnish Kshatriya** (Global Head & Principal Consultant of Transformation & Advisory Office (TAO) within the CIO/CDO Function of Wipro Limited), **Dr. Snehanшу Saha** (Professor of Computer Science and Engineering at PES University and heads the Center for AstroInformatics, Modeling and Simulation). He is also a visiting Professor at the department of Statistics, University of Georgia, USA and BTS Pilani) **Dr. Jagdish Chand Bansal** (Associate Professor at South Asian University New Delhi and Visiting Faculty at Maths and Computer Science, Liverpool Hope University UK), **Dr. Jennifer Corbett** (Lecturer in Psychology at Brunel University, London), **Dr. Bhushan Garware** (Senior Data Scientist at Persistent Systems with special interest in Digital Healthcare), **Dr. Ketan Kotecha** (Director at Symbiosis Institute of Technology, Dean of Faculty of Engineering at Symbiosis International University) and many more.

In this conference an equal opportunity is provided to all the participants to share their ideas in the areas of Machine Intelligence, Computer Vision, Human Computer Interaction, Data Science, and Cognitive Science. The research groups involved are not only scientist but also physicists, biologists, ecologists, and many more. Artificial Intelligence has now become a standard where programs are developed to perform specific tasks, that is being utilized for a wide range of activities including medical diagnosis, electronic trading platforms, robot control, and remote sensing.

AI has been used enormously in numerous fields and industries, including finance, healthcare, education, transportation, and more. These three days International conference includes several such research problems dealing with AI of various real life phenomenon, computational techniques and research articles based on AI and Machine Vision.

This event is the result of the continuous efforts of our students from the day one to its final stage. We congratulate to our dutiful students and faculty members for their great work and endless efforts for making this conference a memorable event. We are very much grateful to all the authors who gave their contributions by sharing their research work in our conference. We gratefully acknowledge all the members of organizing committee and the review panel members who have given their precious time and efforts in this endeavor.

We would like to thank **IEEE Gujarat Section**, **PDPU-Innovation and Incubation Centre** and **Computer Society of India**, for technical and financial support.

We are sincerely thankful to the entire PDEU family especially employees from registrar office, accounts office, amenities, IT department and all others which are directly or indirectly associated to this International event.

Once again, we are very happy to welcome you all in this IEEE international Conference to exchange your views and share experience with internationally renowned Professors, Researchers, Colleagues and Students representing many well-known Universities and Research organizations.

The organizing team wishes all of you a memorable and pleasant stay.

Thanking you for your participation.



A handwritten signature in black ink that reads "Samir Patel".

Dr. Samir Patel
General Chair - AIMV '21
HoD, CSE Dept., PDEU



A handwritten signature in black ink that reads "Santosh Kumar Bharti".

Dr. Santosh Kumar Bharti
General Chair - AIMV '21
CSE Dept., PDEU

Message from Chief Patron

It is indeed a pleasure for me to know that the Department of Computer Science and Engineering, School of Technology, Pandit Deendayal Energy University (PDEU), Gandhinagar, Gujarat organizing an International Conference on “Artificial Intelligence and Machine Vision”, during September 24-26, 2021.

At this momentous historic juncture, where we stand high amidst the pandemic, the knowledge torch keeps the intellectual flame burning bright at our university. Artificial Intelligence (AI) is a rapidly growing field in both IT and academia. It has a significant impact on the advancement of science and technology. It is also constantly changing and evolving in response to new scientific discoveries and social needs. Global technological advancements are prompting people to come up with new solutions to solve real-world problems. The theme as well as sub-themes of this international conference are quite apt, given the global as well as national challenges.

PDPU has developed a vibrant campus with advanced facilities and technologies on its campus. It has set up State of the art Laboratories in each discipline with support of Industries, Knowledge partners and internationally renowned University partners. The University has also developed cutting edge digital infrastructure with up to date research and educational curriculum to promote and facilitate research and learnings.

Through its various endeavors, PDEU has made a significant number of value-based contributions to society, and this conference will provide an additional multi-disciplinary forum for all stakeholders in the global community to discuss and share their ideas and opinions on how to address the real-life problems. I wish success to this initiative of our University on Artificial Intelligence and Machine Vision'.



Prof. (Dr.) S Sunder Manoharan

Chief Patron - AIMV '21

Director General, PDEU

Message from Patron

It gives me immense pleasure to be a part of the 1st edition of our flagship mega event, International Conference on “Artificial Intelligence and Machine Vision”, being organized by the Department of Computer Science and Engineering, Pandit Deendayal Energy University, Gandhinagar, Gujarat from September 24-26, 2021.

AI is gradually gaining a significant position in all domain. Today, artificial intelligence drives everything, and its widespread use accomplishes more than any other technology in history. The technology is being used in a variety of industries and is resulting in significant advances that have a positive impact on humanity.

Considering the current state of the world, the conference's theme is quite timely. It will provide a unique platform for researchers and academics to keep up with the most recent advances in artificial intelligence.

On this occasion, I whole-heartedly welcome our esteemed guests, eminent speakers, and delegates from the country and overseas, participating in the conference.



Prof. (Dr.) Sunil Khanna

Patron - AIMV '21

Director, SOT, PDEU

Message of Congratulations, from Chief Guest

At the outset, I express my appreciation for the Department of Computer Science & Engineering, Pandit Deendayal Energy University for their initiative in arranging an International Conference on “Artificial Intelligence and Machine Vision”. Their efforts in arranging this event during the Covid19 pandemic is noteworthy.

Starting with the Industrial Revolution 1.0 in the later part of the 18th century, industry has grown to Industry 4.0 and is on the verge of moving towards Industry 5.0. Industry 4.0 is characterized by intelligent machines. Artificial Intelligence forms the core technology. Lower cost of hardware, miniaturization of gadgets, and development in software has fueled this growth considerably. Everything we do and use today are affected by these technologies. Artificial intelligence enables machines with the intelligence of humans even though they will take many years to reach the competency of humans.

AI is influencing every sector affecting us. AI has been the driving force behind the development of technologies such as Big Data, Cloud Computing, robotics, and the Internet of Things and will continue to dominate in the foreseeable future. AI is also being used in all application areas. I am confident this conference will provide a platform to express and share thoughts and innovative ideas. I sincerely appreciate the efforts by the university in organizing this event in this unprecedented period and providing a platform for valuable knowledge sharing.

Wishing the entire team a successful event with meaningful deliberations and thought sharing.



Prof. Sharatkumar Patra
Director, IIIT Vadodara, Gujarat, India

Message of Congratulations, from Guest of Honor

It is our great pleasure to welcome all of you to International Conference on Artificial Intelligence & Machine Vision (AIMV 2021).

AIMV 2021 brings together researchers and professionals from the emerging fields of AI and ML, where the forum is equipped with keynote sessions, plenary sessions, and technical paper presentation. We thank all speakers, paper contributors and participants in the event.

Congratulations to the organizing team for making this event a grand success!



Prof. Maniklal Das
DA-IICT, Gandhinagar, India
2021 Chair - IEEE Gujarat Section

DETAILED PRESENTATION SCHEDULE

DAY-I

Day-1 Session-1

Session Chair 1: Dr. Kaushal Shah

Session Chair 2: Dr. Mohendra Roy

Paper Presentation (2:30 PM - 4.00 PM)

S. No.	P_ID	Authors' Name	Paper Title
1	4	Toshita Sharma and Riya D Tanna	Binary Classification of Melanoma Skin Cancer using SVM and CNN
2	5	Ranjana S Jadhav, Tanay P Vartak, Kalyani A Vidhate, Shailesh N. Kadam, Tasmiya Tamreen Kankurti and Rutvik Deshmukh	Automatic Mask and Temperature Detection System using Deep Learning and Bus sanitization module for Covid-19
3	7	Manasi Sambhaji More and Deepali Joshi	An Examination Application for Blind Students With Subjective Answer Evaluator
4	9	Sanjana Dumpala and Premanand Ghadekar	Deep Learning model for diagnosis and report generation of lethal chest diseases using X-rays
5	12	Ashish Lalchandani and Dr. Samir B. Patel	Smart IoT Based People Counting System
6	13	Siddhartha kumar Arjaria, Riya Sahu, Sejal Agarwal, Suyash Khare, Yashi Agrawal and Gyanendra Chaubey	Hand Gesture Identification System Using Convolutional Neural Networks

Day-1 Session-2

Session Chair 1: Dr. Rajeev Kumar Gupta

Session Chair 2: Dr. Hardik Patel

Paper Presentation (2:30 PM - 4.00 PM)

S. No.	P_ID	Authors' Name	Paper Title
1	16	Premanand Ghadekar, Tejas V Kachare, Abhishek S., Om Deshpande, Rushikesh Chounde and Prachi Tapadiya	Voice Controlled Augmented Reality For Real Estate
2	17	Vishva H Jani, Dr. Samir B. Patel and Kush S Sutaria	IoT in Automobile Industry – A Smart Sensor Based Collision Avoidance Parking system
3	21	Kevin Vijaykumar Patel and Rajeev Kumar Gupta	Song playlist generator system based on Facial Expression and Song Mood
4	25	Ambarish Shashank Gadgil, Aditya Desity, Prasanna Hemant Asole, Harsh Shailesh Dandge and Spurti Sachin Shinde	Stock Market Prediction through Artificial Intelligence, Machine Learning and Neural Networks
5	30	Priyank R Mistry, Vedang V Jotaniya, Parth Patel, Narendra M. Patel and Mosin Dr Hasan	Indian Sign Language Recognition using Deep Learning
6	31	Deepali Deshpande, Tejas V Kachare, Swapnil Jadhav, Kaustubh Bhale, Rushikesh Chounde and Pratik Waso	A Survey on the Role of IoT in Agriculture for Smart Farming

Day-1 Session-3

Session Chair 1: Dr. Nayantara Kotoky

Session Chair 2: Dr. Purvi Koringa

Paper Presentation (4:30 PM - 6.00 PM)

S. No.	P_ID	Authors' Name	Paper Title

1	36	Seema Sachin Vanjire and Dr. M Lakshmi	Behaviour-based Anomaly Detection System Approach for Mobile Security using Machine Learning
2	39	Anshul Joshi and Premanand Ghadekar	Dyslexia Prediction Using Machine Learning
3	40	Mansi K Phute, Aditi Sahastrabudhe, Sameer Pimparkhede, Shubham Potphode, Kshitij Rengade and Swati Shilaskar	A Survey on Machine Learning in Lithography
4	41	Nitish U Thorat, Yash S Punna, Jay Appa Narayane, Sourav Sanjay Waje and Geeta S Navale	An E-commerce Medicine Website Deployed on AWS with Prescription Verification
5	42	Savita R. Gandhi, Aishawariya Athawale, Hetvi Julasana and Suchit Purohit	Evaluation and Comparison of Machine Learning Algorithms for Solar Flare Class Prediction
6	44	Akshit J Dhruv and Dr. Santosh Kumar Bharti	Real-Time Sign Language Converter for Mute and Deaf People

Day-1 Session-4

Session Chair 1: Dr. Vipin Shukla

Session Chair 2: Dr. Rutvij Jhaveri

Paper Presentation (4:30 PM - 6.00 PM)

S. No.	P_ID	Authors' Name	Paper Title
1	45	Shanu Verma, Rashmi Mukhija and Harish Tanwar	A Machine Learning Approach to Thyroid Carcinoma Prediction
2	46	Anushka Sharma, Smiti Singhal and Dhara Ajudia	Intelligent Recruitment System Using NLP
3	48	Jash Doshi and Harsh Rakesh Patel	Chatbot User Interface for Customer Relationship Management using NLP models
4	49	Daniel Lobo, Jenny H Dcruz, Leander J Fernandes, Smita Deulkar and Priya K Karunakaran	Emotionally relevant background music generation for audiobooks
5	50	Jash Doshi and Harsh Rakesh Patel	Human Action Recognition in Dark Videos
6	53	Arati R Dhake and Sudeep Thepade	Improved Face Gender Identification Using Fusion of Global Thepade's SBTC and Local OTSU Thresholding Features
7	64	Dhvani M Vaidya and Akshit J Dhruv	Data-science to predict Entrepreneurial Skills based on Profession

DAY-II

Day-2 Session-5

Session Chair 1: Dr. Premanand Ghadekar

Session Chair 2: Dr. Rajeev Kumar Gupta

Paper Presentation (12:30 PM - 1:30 PM)

S. No.	P_ID	Authors' Name	Paper Title
1	54	Mehul D Bhundiya and Maulik D Trivedi	An Efficient Spam Review Detection Using Active Deep Learning Classifiers
2	62	Shreya Kothavale, Shivam Pawar, Sanket Kankarej and Sonali Patil	Smart Indoor Navigation, Shopping Recommendation & Queue less billing based shopping assistant using AI

3	63	Harshvardhan Gaikwad	Application of an Expert System for Reverse Parking Sensor in an Electrical Vehicle
4	182	Mayuresh A Pingale, Apoorv Kakade, Anish A Dhage, Gautam Nahar, Sheetal Sonawane and Archana Ghotkar	Recommendation and Prediction of Solar energy consumption for smart homes using machine learning algorithms
5	68	Namit Kharade and Amrut Khatavkar	Helmet Violation Detection using Deep Learning Techniques
6	69	Hansal M Shah, Aditya Shaulik Gandhi, Badal M Parmar, Devam Jariwala and Dr. Nishant Doshi	Integrated Database Management System for Emergency Services

Day-2 Session-6

Session Chair 1: Dr. Pramit Mazumdar

Session Chair 2: Dr. Shakti Mishra

Paper Presentation (12:30 PM - 1:30 PM)

S. No.	P_ID	Authors' Name	Paper Title
1	70	Maya N, Bindu VR and Greeshma M S	An Effective Keypoints Extraction Scheme for Image Tampering Detection
2	71	Babita Pathik	Analysis of Effort Estimation for Test Suite using Control Graph
3	72	Akshad M Jha , Raj Walnuskar, Saurabh Vedak, Utkarsh Chopade, Kapil Mundada and Anand Iyer	Early Fire Detection using Deep Learning
4	74	Aditya Naik, Vijay Gaikwad, Rajesh Jalnekar and Milind Rane	Daily Stock Price Direction Prediction using Random Multi-Layer Perceptron
5	80	Vivek S Bharati	A Deep Neural Network Machine Vision Application for Preventing Wildlife-Human Conflicts
6	82	Deepali Joshi, Adarsh Sharma, Shantanu Pingale, Chanchal Sunil Mal, Sangeeta Malviya and Nikita K Patil	Face Mask Detection Using Optimized CNN

Day-2 Session-7

Session Chair 1: Dr. Adarsh Parikh

Session Chair 2: Dr. Paawan Sharma

Paper Presentation (2:30 PM - 4:30 PM)

S. No.	P_ID	Authors' Name	Paper Title
1	84	Charmi K. Jobanputra, Vishwa Vora, Nihit Parikh and Dr. Santosh Kumar Bharti	Parts-of-Speech Tagger for Gujarati Language using Long-short-Term-Memory
2	86	Aishwarya Kogekar, Rashmirajan Nayak and Umesh Chandra Pati	A CNN-GRU-SVR based Deep Hybrid Model for Water Quality Forecasting of the River Ganga
3	89	Trisha K. Baldha, Malvi Mungalpara, Priyanka M Goradia and Dr. Santosh Kumar Bharti	Covid-19 Vaccine Tweets Sentiment Analysis and Topic Modelling for Public Opinion Mining
4	91	Dhara Ladani and Nikita Desai	Automatic stopword Identification Technique for Gujarati text
5	93	Sayyam Gada, Akash A Dhuri, Denish Mukesh Jain, Smita P Bansod and Dhanashree Toradmalle	Blockchain-Based Crowdfunding: A Trust Building Model
6	94	Aditya Razdan and SHRIDEVI S	Hate Speech Detection using ML Algorithms

7	99	Namrata Singh and Pradeep Singh	Exploring the effect of normalization on medical data classification
8	101	Chaitali Mehta, Dr. Paawan Sharma and Amit Vilas Sant	A Comprehensive study of Machine Learning Techniques used for estimating State of Charge for Li-ion Battery
Day-2 Session-8			

Session Chair 1: Dr. Priyanka Sharma

Session Chair 2: Dr. Debabrata Swain

Paper Presentation (2:30 PM - 4:30 PM)

S. No.	P_ID	Authors' Name	Paper Title
1	102	Shaanya Singh, Maithili Lohakare, Keval Sayar and Shivi Sharma	RecNN: A Deep Neural Network based Recommendation System
2	103	K Harshini, Padmini Kousalya Madhira, Chaitra S and Pradeep Reddy Gogulamudi	Enhanced Demand Forecasting System For Food and Raw Materials Using Ensemble Learning
3	104	Rahul B Diwate	Dementia Prediction Using OASIS Data for Alzheimer's Research
4	105	Aravind Kannan, Atish Jain, Ruchi I. Gajjar, Manish Ishwarlal Patel and Prem Nivas	LSTM-Based Prediction of COVID-19 Vaccination Drive in India
5	107	Megha V and Rajkumar K K	Automatic Satellite Image Stitching Based on Speeded Up Robust Feature
6	108	Rohini b Khanday	Analysis of LoRa framework in IoT Technology
7	109	Aditi Gupta, Astha Kawatra, Mitali Mishra and Chaitali Chandankhede	YouTube Content Analysis For Hair Extension's Business
8	112	Santosh K Satapathy and Hari Kishan Kondaveeti	Prognosis of Sleep Stage Classification Using Machine Learning Techniques Applied on single channel of EEG signal of both Healthy Subjects and Mild Sleep effected Subjects

Day-2 Session-9

Session Chair 1: Dr. Vibha Patel

Session Chair 2: Ashok Karania

Paper Presentation (4:45 PM - 6:15 PM)

S. No.	P_ID	Authors' Name	Paper Title
1	113	Yanvi Soni, Priyanka M Goradia, Malvi Mungalpara, and Trisha K. Baldha	Deep Convolutional Neural Networks for Scene Understanding: A Study of Semantic Segmentation Models
2	115	Vaishnavi Jamdar, Yogita D, Manikrao Dhore, Trupti Khedekar and Sneha Waghmare	Inner Voice - An effortless way of communication for the physically challenged deaf and mute people
3	117	Vaishnavi Jamdar, Manikrao Dhore, Trupti Khedekar and Sneha Waghmare	RFID Automatic Bus Ticketing System
4	118	Akshay V Munot, Eshaan N. Mohod, Sahil R Hemnani, and Babita D. Sonare	COVID-19 Outbreak from the Experience of Wave 1 and start of Wave 2: Comparison and Analysis
5	119	Sangeeta Kumari	Market Basket Analysis using A-Priori and FP-Tree Algorithm
6	120	Ketaki A Pattani and Sunil Gautam	A stealthy evasive information invasion using covert channel in mobile phones

Day-2 Session-10

Session Chair 1: Dr. Sunil Gautam

Session Chair 2: Dr. Pallabi Saikia

Paper Presentation (4:45 PM - 6:15 PM)

S. No.	P_ID	Authors' Name	Paper Title
1	129	Ipsita Goel, Siddharth Goradia and Kakelli Anil Kumar	Predicting the Presence of Amphibians Near Road Construction Sites Using Emerging Machine Learning Algorithms
2	135	Sindhu C and Vadiu G	ExOpSum: An Extractive Opinion Summarization methodology based on aspect-sentence-review ranking
3	136	BHARATH S, Khusi C, Ritu Ritu, Shuvendu Maity and M MANOJ KUMAR	IOT BASED SORTING MACHINE USING MQTT PROTOCOL AND MYSQL
4	139	Nisarg Vora, Arush Patel, Kathan Shah and Pallabi Saikia	Land Cover Classification from Satellite Data using Machine Learning Techniques
5	141	Abhi N Lad, Khushali B Patel, Soumya C and Yash Solanki	Improving Machine Learning based Groundwater Level Estimation using Geological Features
6	142	Abhi N Lad, Prithviraj Kanaujia, Soumya C and Yash Solanki	Computer Vision enabled Adaptive Speed Limit Control for Vehicle Safety

DAY - III

Day-3 Session-11

Session Chair 1: Dr. Raju G.

Session Chair 2: Dr. Debabrata Swain

Paper Presentation (10:30 AM - 12:30 PM)

S. No.	P_ID	Authors' Name	Paper Title
1	143	Abhinav Thapper, Aditya Kulraj Kunwar, Ashutosh Raturi and Rajni Jindal	Analysis of Various Clustering Algorithms to Enhance Bag-of-Visual-Words for Drowsiness Prediction
2	144	Archana C. Magare and Maulika Patel	Biomarkers Identification for Parkinson's Disease using Machine Learning
3	145	Vinay O Khilwani, Vasu P Gondaliya, Shreya Manish Patel, Jay Hemnani, Bhuvan Gandhi and Dr. Santosh Kumar Bharti	Diabetes Prediction, using Stacking Classifier
4	146	Anant Dhok, Anuj Khandelwal, Deepali Joshi, Sonica Kulkarni and Srivallabh Mangrulkar	Real Time Emotion Analysis (RTEA)
5	147	Sanjit Kumar , Anil Kumar Kakelli and Rahul Raman	Internet of Things Security: Attacks, Solutions, Strengths and Limitations
6	150	Poojangi Gadekar and Dr. Shubhangi Vinayak Tikhe	Simulating the Cognitive Thought Process with a Modified Genetic Algorithm
7	151	Sachin Sharma and Dr Santosh Kumar Bharti	Malware Analysis using Ensemble Techniques: A Machine Learning Approach
8	152	Jigar shah	A review on Human Activity Recognition

Day-3 Session-12

Session Chair 1: Dr. Mehul Barot

Session Chair 2: Chintan Patel

Paper Presentation (10:30 AM - 12:30 PM)

S. No.	P_ID	Authors' Name	Paper Title

1	154	Chandrasekhar Reddy K	Machine Intelligence-Based Reference Evapotranspiration Modelling: An application of Neural Networks
2	158	Vasu P Gondaliya, Shreya Manish Patel, Jay Hemnani and Dr. Samir B. Patel	Efficient vaccine scheduler based on CPU scheduling algorithms
3	179	Nishant A Rajadhyaksha	Modelling Veracity of Football Player Trade Rumours on Twitter Using Naive Bayes Algorithm
4	181	Abhinav Thapper, Aditya Kulraj Kunwar, Ashutosh Raturi and Rajni Jindal	Analysis and Application of Regularized Neural Networks in Smart Agriculture
5	189	ANEESH R KHANDELWAL	Histopathological Cancer Detection using Deep Learning
6	192	Debabrata Swain	Intelligent system for detecting intrusion with Feature bagging

Day-3 Session-13

Session Chair 1: Dr. Kanhaiya Sharma

Session Chair 2: Dr. Kaushal Shah

Paper Presentation (1:30 PM - 2:30 PM)

S. No.	P_ID	Authors' Name	Paper Title
1	193	A Lakshmanarao, M Raja Babu and T Srinivasa Ravi Kiran	Plant Disease Prediction and classification using Deep Learning ConvNets
2	195	Noopur Tyagi, Deepika Sharma, Jaiteg Singh, Bhisham Sharma and Sushil Narang	Assistive Navigation System for Visually Impaired and Blind People: A Review
3	201	Amrut Khatavkar and Namit Kharade	COVID-19 Exploratory data analysis and disease prediction using deep learning
4	203	Karan Bajaj	Edge, Fog and Cloud-based Smart Communications for IoT Network based Services & Applications

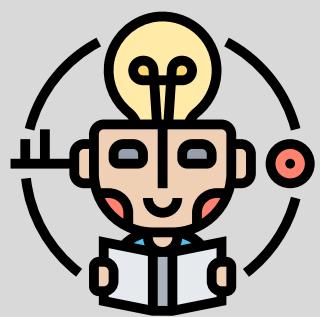
Day-3 Session-14

Session Chair 1: Dr. Nishant Doshi

Session Chair 2: Dr. Arti Jain

Paper Presentation (1:30 PM - 2:30 PM)

S. No.	P_ID	Authors' Name	Paper Title
1	204	Kavita R Shinde	Deep Hybrid Learning Method for Classification of Fetal Brain Abnormalities
2	205	Vishwa P Parmar and Akshit J Dhruv	Efficient sea water Purification using Hybrid Nanofiltration system and ML for Optimization
3	206	Apoorv Kakade, Mihir P Deshpande, Suyash Nitin Sardeshpande and Varad Suhas Thokal	3D Modelling using Sequential and Convolutional Generative Adversarial Networks.
4	208	Nirali Sharad Parekh and Lynette D'Mello	ChaDRaL: RGB Image Encryption based on 3D Chaotic Map, DNA, RSA and LSB
5	190	Pavan Kumar Dharmoju, Karthik Yeluripati, Jahnvi Guduri and Kowstubha Palle	FORECASTING ELECTRICAL DEMAND FOR THE RESIDENTIAL SECTOR AT THE NATIONAL LEVEL USING DEEP LEARNING



ACCEPTED
ABSTRACTS

Binary Classification of Melanoma Skin Cancer using SVM and CNN

Toshita Sharma and Riya D Tanna

Nirma University

Skin cancer is seen as one of the most hazardous forms of cancer found in humans. Malignant Melanoma is a deadly and dangerous type of skin cancer. Most skin cancers either spread to other parts of the body and are fatal unless identified and treated early. Medical technology has shown advancement in computer-aided diagnosis systems which can classify dermoscopic images. In this paper, we propose two methods for the Detection of Skin Cancers particularly with image data taken for melanoma cancerous cells. One is using Convolutional Neural Networks with three layers and the second one is simple model of Support Vector Machines with the default RBF kernel. After applying the image processing techniques, the extracted feature parameters are used to classify the image as Benign or Malignant. The calculation metrics are accuracy, ROC curve, and the AUC and confusion matrix. The classification accuracy obtained using the SVM classifier is 79.39% and AUC is 0.81. CNN is computed for 100 epochs and the accuracy obtained is 84.39%. The CNN model is bought for deployment in form of a web app with the help of streamlit.

Automatic Mask and Temperature Detection System using Deep Learning and Bus sanitization module for Covid-19

Ranjana S Jadhav, Tanay P Vartak, Kalyani A Vidhate, Shailesh N. Kadam,

Tasmiya Tamreen Kankurti and Rutvik Deshmukh

Vishwakarma Institute of Technology

In the pandemic situation of Covid-19 the public transport was totally stuck. During the phase of unlock the offices, banks, and other institutes started reopening. But restarting the public transport was the major challenge. Citizens were facing a lot of issues due to this problem. A survey says that about 85 to 90% population in India travels through public transport. Hence, it was essential to restart the public transport as soon as possible. The proposed idea in this paper focuses on solving the above-mentioned problem. The precautions and rules that are implemented by the government in welfare of the citizens are only available at offices and other public places. The proposed system makes it possible to implement such measures in public transport effectively so that people can travel through public transport without the fear of the virus.

An Examination Application for Blind Students With Subjective Answer Evaluator

Manasi Sambhaji More and Deepali Joshi

Vishwakarma Institute Of Technology

We present in this paper an examination application for blind students with a subjective answer evaluator. In the present scenario, Blind students need a volunteer to give exams, but we have proposed a solution to that by developing a completely voice-controlled website that also records answers given by the students. This will help increase the number of literates who are visually impaired giving as they can independently give exams. The current way of checking subjective answers is adverse. Whenever a human being evaluates papers, the quality is affected by emotion. In this paper, we are proposing four different models for subjective answers evaluation using machine language. These models include Logistic Regression, Decision Tree, Random Forest, K-Nearest Neighbors. After testing Random Forest proved to be the best giving 83%accuracy.

IoT in Automobile Industry – A Smart Sensor Based Collision Avoidance Parking system

Vishva H Jani, Dr. Samir B. Patel and Kush S Sutaria

Pandit Deendayal Petroleum University

The automobile industry is one of the most thriving and rapidly growing industries in the modern world and with the recent advancement in technologies, it is inevitable to avoid the merger of different technological sectors for creating more efficient systems. Automobile manufacturers have understood the plethora of features and advancements IoT provides and especially in the safety of the vehicle and its passengers and as the cars become bigger and longer, the safety of the vehicle has become a major concern for the manufacturers as bigger support pillars introduce more hindrance in the driver's field of view. It becomes even more difficult for amateur drivers and geriatric people to handle such vehicles, as they are not able to get a proper judgment of the size of the car making them unable to maneuver the car properly. So far, only a few cost-effective systems are available in the market which assists the driver in avoiding a front-head collision. In this paper, an android application has been built that incorporates all of the above-mentioned components and helps to avoid head-on accidents utilising the Raspberry Pi, motioneyeOS, cameras, Arduino, ultrasonic sensor, and LCD screen. The cameras are placed in front of the vehicle which will assist the driver in avoiding the obstacles which are in front of the car. The prototype system has shown promising results and the components and the technology implemented are quite feasible and cost-effective.

Voice Controlled Augmented Reality For Real Estate

Premanand Ghadekar, Tejas V Kachare, Abhishek S., Om Deshpande,
Rushikesh Chounde and Prachi Tapadiya

Vishwakarma Institute Of Technology

As technology advances, augmented reality is becoming more prevalent in every business. The most frequent usage of AR is to project real things onto the user, which is usually done via an image target. In the real estate industry, no one can deny AR's capacity to improve the buying and selling experience. AR can help real estate developers expand their marketing methods and give clients a more memorable home experience. It has already been used in apps for house design and land hunting, and the industry's strike proves that Augmented Reality has a lot more to give. Everyone nowadays has a smartphone or tablet with which to access the internet, and the technology utilized in these devices is improving every day. As a result, using AR tools in everyday life and having a comfortable AR experience on mobile devices is becoming more convenient. The amount of time spent touring each site with consumers and not having appropriate resources to impress them is a common challenge that real estate developers confront. Augmented reality software is frequently the seal of approval that realtors receive in order to grow their business and overcome these obstacles. This paper proposes a method for projecting a home onto an image target and allowing the user to explore the interior of the house. Voice controllers incorporated into AR can control the interior.

Smart IoT Based People Counting System

Ashish Lalchandani and Dr. Samir B. Patel
Pandit Deendayal Petroleum University

People counting is of interest in many commercial scenarios. The number of people entering and leaving shops, the occupancy of office buildings or the passenger count of trains provide useful information to shop owners, security officials, train operators, tourism management, transport management and disaster management. To that end, this paper proposes a scheme for counting people based on a variety of approaches. One with RaspberryPi and USB webcam and another with Arduino UNO and IR sensors and further compare their accuracies. In the work it is observed that people counter using IR sensors is much more accurate than the counter which uses USB webcam and OpenCV algorithm. But different ways to increase the frame per seconds of the webcam also make RaspberryPi more efficient to process the OpenCV algorithms accurately.

Deep Learning model for diagnosis and report generation of lethal chest diseases using X-rays

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Viewing medical images, diagnosing and summarizing them is a challenging task. An expert in this field gives a description of the X Ray in the form of a radiology report by distinguishing between the usual and unusual findings and provide an overview for their decision. Research shows that because of the inadequate number of experts, which in turn increases patient volumes, and the nature of human perception, radiology practice sometimes results in error. To lessen the volume of analytical errors and to assuage the job of radiologists, there is a necessity for a computer-assisted diagnosis and create a radiology report when an X Ray is given as an input. In the proposed model, chest X Rays are used for the diagnosis of diseases. Additionally, VGG16 has been used to classify the images resulting in an accuracy of 88%. For summarizing the X-rays, Encoder Decoder model has been used along with the Xception model. To further evaluate the reports, Bilingual evaluation has been used which has given a score of 96 percent for the proposed model.

Integrating Machine to Machine Communication (M2M) and MQTT Protocol Techniques for Conversion of Water Motor Pump into a Smart System

Rahul Bejgam and Tulasi Krishna Gannavaram V

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Among the precious elements that are available over the planet Earth, water is precious and is one of the major elements for human survival. There were many innovative projects to conserve the water and also regulate its usage. Internet accessibility has given some advantage for humans to innovate themselves in conserving and regulate the water management techniques. This project connects a human Personal Digital Assistant (PDA) integrated with web based application and a domestic water motor involved in pumping water from a source of water to a sink that stores water, formally an overhead water tank. The connection can be established using the Internet as a medium of interaction between the Humans and the electromechanical motor either to power it on or off. The concept of connecting things to internet using MQTT protocol has actually been of good use in implementing the home automation projects, MQTT is usually preferred more in the Machine to Machine communication (M2M) projects. It is most important building blocks for the Internet of Things (IoT). M2M communication represents intelligent node to node systems that facilitate smart solutions a machine can communicate with other machine to ease a task and improve the quality of life for humans.

Hand Gesture Identification System Using Convolutional Neural Networks

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Recognition of hand movements is a key to conquering several difficulties and building warmth for human life. In an enormous number of applications, human actions and their significance are used in an array of applications to grasp the flexibility of machines. Sign language interpretation is one particular area of interest. This paper describes a practical and interactive method for hand gesture detection using a Convolutional Neural Network. The techniques are suitably graded into various stages during the process, such as the data acquisition, pre-processing, segmentation, extraction of features, and classification. The different algorithms that have done their task at each location are elaborated, along with their merits. Challenges and limitations faced during the process are discussed. Overall, it is hoped that the analysis might provide a detailed introduction into the sector of machine-driven gesture and signing acknowledgment and further facilitation of future research efforts in this sector. The proposed methodology has been tested over the 70400 images, and it classifies the images with an approximate accuracy of above 95%.

Song playlist generator system based on Facial Expression and Song Mood

Kevin Vijaykumar Patel and Rajeev Kumar Gupta

Pandit Deendayal Petroleum University

Nowadays song becomes important part of daily lifestyle. After emergence of the different music players into the market person are tend to listen music during day-to-day activities as well as listen for relaxing from daily stress. So that this music players are trying to provide best possible recommendation for the user. So that in this paper we are going to proposed new approach for the playlist generation task. In this approach we have proposed method to generate playlist from the emotion of the user and user personal choices of the songs for providing more personalized experience. After introduction of the Convolutional Neural Network object detection, Image classification, Emotion detection tasks reaches great height. In proposed method we have used CNN for Emotion detection task and ANN for the song classification task. With the CNN we have achieve 84% accuracy with FER-13 dataset which contain around 14k facial images. For song classification task we have used different song-features which is extracted from Spotify music player. We have achieved 82% accuracy in song classification task. Currently this system is only with Spotify music player.

Isolated Gujarati Handwritten Character Recognition (HCR) using Deep Learning (LSTM)

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With the swiftly escalating the paperless and automated offices and governance, there is a need of converting the paper document into machine editable form. HCR is the form of optical character recognition to recognition the printed or handwritten text into digital text. HCR is more challenging due to diversity in human writing style, size, curve, stroke, and thickness of the character. The HCR systems are readily available for foreign languages and many of the Indian languages like Bangla, Devanagari, and Gurumukhi but for the Gujarati language the HCR development is still in its infancy stage [1]. This study is focused on the development of a deep learning-based offline HCR model for Gujarati Handwritten character recognition. Along with this an attempt to improve the rate of Gujarati character recognition using the LSTM model with the help of teaching and learning process of model with the given dataset of almost 58,000 images. The novelty of this proposed system is to identify a complete set of Gujarati characters that are available with the Unicode dataset. Author have used LSTM model in this study and achieved ~ 97% success rate of each character class.

Stock Market Prediction through Artificial Intelligence, Machine Learning and Neural Networks

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Stock prices and their fluctuations have a major impact on our daily lives. Therefore, it is necessary to discuss this forum today and study its various aspects. The use of machine learning(ML) and artificial intelligence(AI) in this field can bring us new insights, and the use of computers to predict prices can give us significant advantages in this field. In this paper, there is a significant attempt to achieve this stock market forecasting with the help of two techniques as follows: The first technique uses neural networking : It is used to collect and analyse the data to calculate a price by finding a suitable balance of past information that equals the present information. The final report which is generated by the above process is then upgraded by combining the actual prices in the past associated with the market. The next technique which is being involved here is linear regression. Linear regression is used to forecast prices that will involve the coming price having a calculated and nearly accurate probability. This model uses the previous data available and gives accurate results for the stock price for the next day. The model will further assist in the future research and will be useful for the growing scientific community in this field.

Indian Sign Language Recognition using Deep Learning

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Sign language is used by people having speaking and hearing disabilities. It generally has a set of words, where each word is represented by one or more hand gestures in sequence and may contain facial expressions. In order to address the interpretation/translation from sign language to English Language, we present our sign recognition approach for Indian sign language which aims to provide a method for interpreting signs in Indian sign language to words in English language translation. The approach is to have a vision based system in which the sequence of images representing a word in ISL is translated to equivalent English word. The translation would be done by means of Deep learning algorithms namely convolutional neural nets and recurrent neural nets. The system will be analyzing sequence of images, hence CNNs will analyze each image and their sequence is analyzed by LSTM (which is an implementation of RNN). We developed two datasets one for training purposes and other for testing, which obtained 99.98% of accuracy and 73.60% cumulative accuracy respectively. The image distributions are kept fairly different in training and testing datasets.

A Survey on the Role of IoT in Agriculture for Smart Farming

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IoT technology helps with the weather, precipitation, temperature, and soil fertility data, as well as crop online monitoring. Farmers can connect to their fields from anywhere at any time thanks to the Internet of Things. Wireless sensor networks are utilized to track farm conditions, while microcontrollers are used to manage and automate agricultural activities. Wireless cameras were used to monitor the type's condition. Farmers should utilize their cell phones to keep informed about current conditions in all parts of the country. The Internet of Things (IoT) is a promising technology that has the potential to update a variety of industries at a low cost and with high reliability. IoT-based solutions are in the works to autonomously manage and track agricultural fields with the bare minimum of human intervention. The article discusses a variety of IoT-related technologies in agriculture. It goes over the key elements of IoT-enabled smart farming.

Behaviour-based Anomaly Detection System Approach for Mobile Security using Machine Learning

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In today's world, mobile security is critical not only for our society but also for each individual. Today, everyone wants their own mobile device, which has resulted in a growth in the number of Android users around the world. Each device with internet access interacts with a variety of applications, resulting in a large number of malware infections or dangers in a mobile home. Our strategy moving forward will be to keep everyone's mobile device secure. So, using machine learning, we've created a model for a behavior-based anomaly detection system from an Android mobile device. We used three machine algorithms in this system to detect malware vulnerabilities based on the behaviour of mobile applications. To determine the accuracy of mobile application behaviour in this system, we employed KNN, Naive Bayes, and a decision tree method. As a result, this technique can be utilised to keep a person's Android mobile secure.

An E-commerce Medicine Website Deployed on AWS with Prescription Verification

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Sourav Sanjay Waje and Geeta S Navale

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E-commerce websites have made everyone's lives simpler in the current date due to the luxury provided by them of getting almost anything delivered at the doorstep at any time required. There are also websites that provide the same advantage to order medicines whenever needed. The drawback of such websites is that the prescription is not verified on those. A prescription is the most important component when it comes to buying prescription based drugs. The proposed work aims to develop an e-commerce website that offers medicines and drugs with the feature of connecting the customers with their doctors using simple web development tools. Also, the doctors will be able to write the prescriptions via this website for their patients. The customers can use this prescription to order medicines for themselves safely or can use the same prescription to order medicines from their local chemist. A prescription parser will be created to check the prescriptions by using the python-docx, docx2pdf module of Python. These prescriptions will be signed and verified using the RSA algorithm. For this, the rsa module of python will be used. The encryption of the prescriptions will be done using the 'SHA-512' hash module. This website will be deployed on Amazon Web Services (AWS) due to their low cost in their services, flexibility, security and pay-as-you-go pricing. The services used for the same will be EC2, RDS, S3. Also, a round of Vulnerability Assessment and Penetration Testing (VAPT) will be performed on the website to remove the vulnerabilities and reduce the chances of Ethical Hacking.

Dyslexia Prediction Using Machine Learning

Anshul Joshi and Premanand Ghadekar
Vishwakarma Institute of Technology

Dyslexia is a learning disorder characterized by a lack of reading and /or writing skills, difficulty in rapid word naming, and also poor spelling. Dyslexia can be written down into two ways, surface, and phonological dyslexia. The challenge of reading the word as a whole is surface dyslexia, while phonological dyslexia is the issue of exploring a portion of a word. Scientists are interested mainly in phonological dyslexia since it is more severe. A kid can read and show indicators of reading problems most of the time, and dyslexia is recognized. If phonological indicators are used to diagnose the disease before a kid can read it, it would have substantial advantages for early reading. The current effort aims to produce a software tool that parents may use before their children can determine if a child's dyslexia is in danger. In this, the techniques used are SVM, Grid search CV with an accuracy of 97.42%. We have improved the accuracy in predicting dyslexia by using conventional methodologies of predicting dyslexia.

A CNN-SVM based Computer Aided Diagnosis of Breast Cancer using Histogram K-Means Segmentation Technique

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MANIT Bhopal

Breast Cancer is reported as one of the most diagnosed cancers among all cancers and the most common health issue reported among adult females. Prior detection and screening of patients can help to reduce the high mortality rate. Computer Aided Diagnosis (CAD) using different imaging methods like mammography, Computed Tomography (CT), ultrasound, and biopsy (histopathological images) is beneficial for early diagnoses and detection. In this paper, we used histogram-based K-means for sections of K clusters and spatial location to segment the ROIs from images. The tumor is segmented from another part of the tissue. Before segmentation, we utilized haze reduction to enhance the images and make them more define and sharp. The segmented images help in feature selection, where a pretrained ReNet18 is used to extract the features from the dataset. Support Vector Machine (SVM) is used to classify these extracted features. The experiments were analyzed over the BreakHis dataset, which contains two categories benign and malignant. The obtained performance is for all four (40x,100x,200x,400x) magnification factor. The result shows that the proposed model achieves an accuracy score of 91.275% with the highest accuracy of 92.6% for 200x magnification. The average sensitivity obtained is 89.325%, where the highest sensitivity score is 94.1% for 200xmagnification. Average specificity and average precision were reported as 92.225% and 82.425%, respectively. The highest specificity and precision obtained are 93.1% and 84.5%, respectively, for the100x magnification factor. The obtained results proved that the proposed architecture is efficient in image classification of histopathological breast cancer cell images. Also, the obtained results were found better than previously reported studies.

A Survey on Machine Learning in Lithography

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Vishwakarma Institute of Technology

Lithography is the process of transferring the geometric patterns from the masks to the resist material on the semiconductor. It is a very important part of VLSI fabrication that is critical when it comes to the efficient functioning of circuits. Many state-of-the-art methods use Machine Learning (ML) to identify lithography patterns that can cause issues in the future as these algorithms can predict defects in patterns which the machine has not encountered before. This paper focuses on the need for Machine Learning in the lithography process, and the various algorithms used like Support Vector Machines (SVM), Artificial Neural Networks (ANN) and Convolutional Neural Networks (CNN). There are multiple applications including Hotspot detection, Optical Proximity Correction (OPC), Phase Shift Masks (PSM), Sub Resolution Assist Feature (SRAF), and Resist Modelling. The major issue faced by Machine Learning algorithms is that of false positives. It can be reduced by utilizing the Gaussian process after initial detection.

Real-Time Sign Language Converter for Mute and Deaf People

Akshit J Dhruv and Dr. Santosh Kumar Bharti
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Deaf people may get irritated due to the problem of not being able to share their views with common people, which may affect their day-to-day life. This is the main reason to develop such system that can help these people and they can also put their thoughts forward similar to other people who don't have such problem. The advancement in the Artificial intelligence provides the door for developing the system that overcome this difficulty. So this project aims on developing a system which will be able to convert the speech to text for the deaf person, and also sometimes the person might not be able to understand just by text, so the speech will also get converted to the universal sign language. Similarly, for the mute people the sign language which they are using will get converted to speech. We will take help of various ML and AI concepts along with NLP to develop the accurate model. Convolutional neural networks (CNN) will be used for prediction as it is efficient in predicting image input, also as lip movements are fast and continuous so it is hard to capture so along with CNN, the use of attention-based long short-term memory (LSTM) will prove to be efficient. Data Augmentation methods will be used for getting the better results. TensorFlow and Keras are the python libraries that will be used to convert the speech to text. Currently there are many software available but all requires the network connectivity for it to work, while this device will work without the requirement of internet. Using the proposed model we got the accuracy of 100% in predicting sign language and 96% accuracy in sentence level understanding.

Evaluation and Comparison of Machine Learning Algorithms for Solar Flare Class Prediction

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Gujarat University

A solar flare is an intense and sudden release of energy, which can have a significant impact on the reliability of space-borne, and ground-based technological systems. This study explores the potential of machine learning in predicting the class of solar flare namely- B: weakest flare, C: weak flare, M: strong flare, X: strongest flare and N: no flare. The study aims to apply machine learning algorithms on SDO/HMI vector magnetic field data obtained by the Space-weather HMI Active Region Patches (SHARP) and assess the performance of different machine learning algorithms namely Logistic Regression, K-Nearest Neighbor (KNN), Support Vector Machine (SVM), Decision tree, Random Forest, Adaptive Boosting and Gradient Boosting with respect to different performance metrics. Of all applied algorithms, Random Forest was found to outperform other classification algorithms.

Intelligent Recruitment System Using NLP

Anushka Sharma, Smiti Singhal and Dhara Ajudia
Pandit Deendayal Petroleum University

India has the highest population of youths and unemployment is still a major problem. Even though a lot of job opportunities are coming in Pharmaceutical, Business Management, Information Technology, Instructors, Billing Counter, Accounts, Textile Business, Food Industries, Tourism, and many more fields, the number of applications is significantly higher. Eligible candidates and suitable jobs are the prime requirements of a recruiter and a candidate respectively. As per census 2011, 19.1% of the Indian population was constituted of Youth which was expected to become around 34% of the total population by the year 2020. Every day, thousands to lakhs of applications are being received for jobs against few vacancies. Recruiters generally screen the resumes manually for the selection of candidates. Going through every candidate's resume in detail to evaluate them based on the skills, experience, and abilities they possess would take a long time for the recruiter. So, in the practical world, they would only be able to read limited resumes which would lead to organizations losing out on the quality of selection. The paper focuses on extracting data from resumes and performing the required analysis on the data to convert it into useful information for the recruiters. Thus, the Resume Parser would help the recruiters to select the best relevant candidates in a minimal amount of time, consequently saving their time and effort.

A Machine Learning Approach to Thyroid Carcinoma Prediction

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A malignant tumor cell, such as a disorder, forms in the thyroid gland tissue, eventually leading to thyroid cancer. When malignant cancerous cells alter structure or change, thyroid cancer emerges. Mutated cells begin to develop in thyroid and eventually form a tumor if there are enough of cells. Thyroid cancer is one of the most curable forms of cancer if diagnosed early. The goal of this research is to use machine learning algorithms to analyse and forecast thyroid carcinoma based on the year, gender, and age group. The proposed research is a descriptive cross-sectional study that uses evidence in the form of data from the World Bank for Cancer on thyroid carcinoma incidence. The purpose of this research is to understand the global effects of thyroid cancer by gender and age. In the future, this paper will use a machine learning algorithm to predict accuracy on a minimal number of specific thyroid carcinoma attributes.

A Deep Neural Network Machine Vision Application for Preventing Wildlife-Human Conflicts

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Homestead High School

Most wildlife-human conflicts can be prevented if humans, who could potentially be affected, can be alerted about the presence of wildlife nearby so that they can take avoidance measures. The alerts must be accurate and timely so that such measures can be taken. We propose a Deep Neural Network consisting of two stages, that we call 'WildlifeNet', to automatically detect the presence of specific wildlife. WildlifeNet is optimized for low power and low memory so that it can be embedded in edge devices such as surveillance cameras or low cost special-purpose cameras. The first stage in WildlifeNet is an object detection system using the MobileNet model in TensorFlow that detects animals in an image. This is followed by our custom Convolutional Neural Network classification system that identifies specific animal species from the animals detected in the first stage. WildlifeNet uses images from surveillance cameras or low cost cameras placed near typical animal paths to detect the presence of wildlife. The components surrounding WildlifeNet in the machine vision system presented in this paper can quickly alert those living near the specific location where detections occur via their mobile phones. The custom Convolutional Neural Network model in WildlifeNet's second stage was trained using a large number of coyote images from the Caltech wildlife image dataset to demonstrate its usefulness in detecting specific wildlife. We observed a consistently high accuracy of coyote detection with a potential towards even higher accuracies with user feedback. Therefore, this system is a viable candidate for consideration as an effective, fast, low-cost technology to assist in preventing wildlife-human conflicts.

Emotionally relevant background music generation for audiobooks

Daniel Lobo, Jenny H Dcruz, Leander J Fernandes,
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St. Francis Institute of Technology

Over the past few years, the number of people listening to audiobooks has only increased. There is no doubt that audiobooks are a popular source of entertainment. However, one may enjoy the narration more if it came along with some background music which is rarely the case as audiobook producers prefer to avoid paying for this premium service due to its cost. This affects the experience that the author is trying to create for the listener with regard to the story. To help tackle this issue, we propose a system that takes an audiobook and generates relevant background music for it based on the emotions predicted by our hybrid emotion analysis model.

A CNN-GRU-SVR based Deep Hybrid Model for Water Quality Forecasting of the River Ganga

Aishwarya Kogekar, Rashmiranjan Nayak and Umesh Chandra Pati
National Institute of Technology, Rourkela

Water pollution is growing exponentially across the globe due to the mismanagement of technical advances achieved in the field of industries, agriculture, and day-to-day life. In developing countries like India, water pollution is increasing due to faster modifications and the development of new industries. Specifically, the water quality of the national river Ganga has been degrading at a significantly faster pace and caused lots of diseases among the human being as well as aqua-animals. Hence, continuous water quality monitoring with appropriate water quality management plans is required to maintain sustainable growth. The manual methods of water quality analysis are not suitable in order to get the proper results due to the involvement of life risk and high time consumption. Therefore, it is very important to move towards some advanced approaches of data collection, processing, and monitoring which are easy, less costly, and fast. This can be achieved by using data-driven approaches like deep learning techniques due to their strong decision-making ability and automatically learning capabilities from their experience. Hence, a deep hybrid model using Convolutional Neural Networks - Gated Recurrent Units - Support Vector Regression (CNN-GRU-SVR) is proposed to predict the water quality of the river Ganga. Here, only two crucial available water pollutants, such as dissolved oxygen and biochemical oxygen demand, collected from Uttar Pradesh Pollution Control Board's official website, are considered for forecasting. The effectiveness of the proposed model is experimentally established by comparing the results with that of the five different deep learning models that have been developed as baseline models.

An Efficient Spam Review Detection Using Active Deep Learning Classifiers

Mehul D Bhundiya and Maulik D Trivedi

Darshan Institute of Engineering and Technology

Online fake reviews and ratings is making a big impact In order to purchase or subscribe to the online services. So it is important to detect fake review from e-commerce sites. So review spam detection is more important nowadays. There are many research have been done in this area but no one can detect review spam efficiently with high accuracy. This is known as review spamming. We integrate SVM which is a supervised method and unsupervised methods (rating consistency check, question in reviews, all capital letter reviews, link in a review etc.)

Automatic stopword Identification Technique for Gujarati text

Dhara Ladani and Nikita Desai

DDU, Nadiad

Natural Language Processing is an Artificially Intelligent mechanism for computers to analyze, understand, and derive meaning from human language in a smart and useful way. In natural language text processing, common words like ‘a’, ‘the’, ‘is’, ‘an’, etc. are known as a stopword. They are typically considered to have no informative value. It is proved that one of the major benefits of removing stopword in NLP text-based processing is the reduction of the text in the corpus by 35 - 45%, without compromising on the efficiency of the target application performance. There are many stopword lists existing for Non-Indian languages like English, Arabic, French, and German. Even for a few Indian languages like Hindi, Sanskrit, and, Tamil substantial lists are available. But as of date, very little research work is reported for one of the widely used Indian language namely Gujarati. As per our survey, for the Gujarati language, two major approaches have been suggested for stopword identification. The first approach is giving a static generic stopword list, and another approach is a Rule-based approach. The major drawback of these methods is their inability to handle neologism. In this paper, we have suggested a domain-specific, robust, and dynamic stopword list identification mechanism developed for documents written in the Gujarati language. In the TC model, the feature vector reduces by approximately 16%, and on other hand, the accuracy of the TC model increased by nearly 3 %. The experiments also found, removal of these stop words in IR application, increased the Mean Average Precision (MAP) of the system by nearly 31%. Thus, the overall time and space requirements were decreased without compromising on the end results of the system.

Breast Cancer Detection using Machine Learning algorithms

Siddhesh U Sheth and Kapil D Tajane

Pimpri Chinchwad College of Engineering

Cancer detection at an early stage is important so that the patient can be ready to deal with it. There are many Machine Learning architectures that help in predicting cancer. Gene expressions are the most prominent thing in classification of breast cancer. The gene expression dataset currently available includes fewer records and a huge number of features (very high dimensionality). We are going to implement three different approaches on different datasets to find out the best performing approach. In the first approach we have used a recursive feature elimination(RFE) and Random Forest Classifier(RBF) on a Gene expression dataset. In the second approach we have used the Resnet-34 model over histopathology image dataset. And in the third approach we are proposing a CNN architecture which has a small number of convolutional layers for classification of cancerous genes from healthy ones using gene expression data available at Pan-Cancer Atlas. Due to high dimensionality of gene expression data, that too with small count of records and high noise it brings more challenges.

Identification of Indian Medicinal Leaves using Convolutional Neural Networks

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Niranjan P Belhekar and Rajeswari Kannan
Pimpri Chinchwad College of Engineering

India is well known for its traditional medicines and the field of Ayurveda. Indians have used home remedies as first aid to multiple common ailments like cough, cold, stomach ache, etc. These remedies involve using leaves from our day-to-day household ingredients. It was easy for people in the earlier times to identify these leaves and map them to ailments. Using the latest technologies like Machine Learning and Deep Learning, we have explored a technological way of identifying these leaves for all the naive users. In this paper, we have described the implementation of Convolutional Neural Networks (CNN) for the identification of Indian medicinal leaves.

Survey of Machine Learning Algorithms for Location Tracking using Beacons

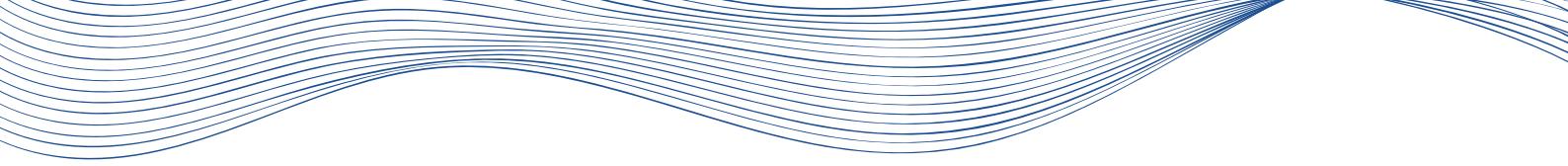
Harshal Pravin, Shailaja V Pede, Aditya Karjule,
Aniket Kamble and Satyavardhan Sunil Kakade
Pimpri Chinchwad College of Engineering

Location tracking with beacons is very trending technology in indoor navigation. Using RFID transmitted by beacons we can detect location by using various machine learning algorithms. We propose to use BLE as it has more accuracy as compared to many other systems and also it has Special Interest Group (SIG) aimed at various novel applications in various domains. In this paper we have conducted a survey of various machine learning algorithms to find the best suitable algorithm for location tracking with beacons.

RecNN: A Deep Neural Network based Recommendation System

Shaanya Singh, Maithili Lohakare, Keval Sayar and Shivi Sharma
Pandit Deendayal Energy University

Deep learning's breakthrough in speech recognition, image analysis and natural language processing has helped it gain a considerable amount of recognition in today's highly modernized world. As it is known, collaborative filtering and content-based filtering are two incredibly desired memory-based methods used for recommending new products to the targeted users, but it does happen to have certain restrictions and it thus fails to provide the intended user with effectual recommendations as primarily required. In this paper, we evaluate the performance of a revised version of a deep learning-based recommender system for movies and books using multiple fully connected dense layered neural net embeddings-based structures that primarily ensembles deep neural networks integrated alongside embedding layers and their dot product values. We develop and test the recommendation systems using the data provided by Wikipedia book dataset and MovieLens 100k dataset for books and movies respectively. To recommend books or movies to a particular user, the inputs are converted to an embedding layer and then passed through dense layers for obtaining recommendations. The same process was applied to 2,3 and 4 layer architecture for obtaining recommendations for both books and movies. The results that we've obtained shows that our approach is a promising solution when compared with the independent memory-based collaborative filtering methods or content-based methods. It leads us to conclude that our comparative study of multiple layered architectures provides probable research directions for deep learning-based recommender systems in the near future.



Improved Face Gender Identification Using Fusion of Global Thepade's SBTC and Local OTSU Thresholding Features

Arati R Dhake and Sudeep Thepade

Pimpri Chinchwad Engineering Technology PCET (PCCOE)

In Image Processing, the face gender classification in real-time applications is an interesting area having important significance. Humans can recognize gender easily but machines find it difficult to recognize gender from facial images. Many researchers are working in order to fill this gap. The recognition of gender is important for human-computer interaction. The goal of this paper is to propose machine learning-based face image gender recognition using global Thepade's SBTC and local Otsu's thresholding features which will help to recognize gender. The experimentations performed on the Faces94 dataset and face gender recognition accuracy has shown the proposed method has given better face gender recognition capability with feature fusion across considered machine learning classifiers.

Human Action Recognition in Dark Videos

Jash Doshi and Harsh Rakesh Patel

New York University

Image processing and action recognition in images are one of the most researched topics in Deep learning. Combining these two concepts for action recognition in low-light footage is useful in a variety of applications, including night surveillance and self-driving at night. Due to the low photon count and SNR, video in low light is difficult. Short exposures videos are prone to noise, while long exposures can result in blur and are often impractical. To get a better understanding of the presented Action Recognition in Dark(ARID) dataset, which has low light videos divided into its action, making it an image classification problem. We examined it in depth and demonstrated its utility using simulated dark images. On this dataset, we also benchmarked the performance of existing action recognition models and investigated possible strategies for improving their performance. We introduce a novel pipeline for low-light images using ResNets and statistical image processing methods to identify the human's actions in it to support the development of learning-based pipelines for human actions recognition in dark videos. We present promising findings from the latest dataset improving the top-1 accuracy by 3.8%. We also examined performance-related causes, and identify areas for potential research.

Chatbot User Interface for Customer Relationship Management using NLP models

Jash Doshi
New York University

NLP is the most researched field. Speech-to- text conversions, fake-news detection, and text summarization are the hot topics of NLP. ChatBot User Interface(UI) using NLP, allows machines to understand customers better. The aim was to use different NLP and machine learning techniques and to add ChatBot UI to guide customers or clients through the CRM software and help them whenever they get stuck. Different approaches, libraries, and algorithms like 'RASA', python's 'Chatterbot', 'Cosine similarity', and Google's embedder were used to train the model and then later compared to see which gave the best results. After that, during the deployment other 2 approaches were tried, one was fetching questions from the database and then training the model, the other was to maintain a local text document and train the model from that. The advantages and disadvantages of each approach, plus challenges and better methods for deployment is also discussed.

Smart Indoor Navigation, Shopping Recommendation & Queue less billing based shopping assistant using AI

Shreya Kothavale, Shivam Pawar, Sanket Kankarej
and Sonali Patil
Pimpri Chinchwad College of Engineering, Pune

This paper presents a queue-less billing system that can be integrated with existing systems for easy and fast checkout at supermarkets. This system includes RFID-based automatic billing checkout as well as a supporting mobile application for customers. The application will cater to additional features like personalised shopping recommendations, product search and indoor navigation, live cart, and voice-based shopping assistant. The user will add products to the cart while shopping. The list of products along with the billing information will be displayed on the mobile application connected to the cart. The mobile application will have an option to pay for the products in the cart. After payment, users can simply walk out with the products. Users can also search for amenities and products and will be navigated to the desired location. While the user is shopping, recommendations will be shown on the mobile application of the products which the user is most likely to buy based on his previous shopping history and current items in the cart. This system can save time and resources for the supermarkets improving efficiency along with giving freedom from long waiting queues.

Application of an Expert System for Reverse Parking Sensor in an Electrical Vehicle

Harshvardhan Gaikwad

Pandit Deendayal Energy University

It is a widely accepted fact that electric vehicles will be replacing the contemporary vehicles in less than three decades. Artificial intelligence (AI) is also a technology of the future. Thus, an integration of both is necessary. Expert System (ES), Fuzzy Logic (FL) and Neural Network (NN) are some very powerful tools of AI that enable the machine to take decisions on its own and improve on its previous mistakes without an external help from a human. An ES manages to take decisions on its own based on the knowledge database that it possesses. AI powered automatic vehicles comprise of several intelligent components which provide a better control of the vehicle to the driver. Reverse parking sensors are an example. These are the devices that aid the driver in parking the vehicle by acting as a warning system. This paper proposes a novel design of the Reverse Parking Sensor for Electric Vehicles (RPSEV) using an Arduino board and an ultrasonic distance sensor. These components together act as an ES that will assist the driver while parking by displaying Light Emitting Diodes (LEDs) and thus human involvement will be greatly reduced.

Data-science to predict Entrepreneurial Skills based on Profession

Dhvani M Vaidya and Akshit J Dhruv

Pandit Deendayal Petroleum University

The main aim is to enable people to discover the entrepreneurial skill needed for a specific job/profession or business. As often people are found having issues getting jobs even when there is a vacancy, or new startups and businesses tend to be unsuccessful in the short run. We analyzed this problem and found that the problem is, people/students are lacking certain entrepreneurial skills, or they aren't aware of those skills. So we found the resolution to this problem by creating a model, with the help of AI and data science, and ML which will help to predict skills based on job/profession or business. This will help to reduce unemployment and uphold business stability as people will get to know what skills they require to execute a particular job or run a business. We have used the multi-output model, and SVM (Support Vector Machine) machine learning model for prediction. Using the model, we got the accuracy of 98.7% in predicting the skills based on profession.

Helmet Violation Detection using Deep Learning Techniques

Sinhgad Institute Of Technology and Science, Narhe

To protect the safety of riders on the road, detection of helmeted and non-helmeted motorcyclists is required. Helmets are meant to keep the driver's head safe in the case of a collision. If a biker does not wear a helmet and is involved in an accident, it might result in death. Most traffic and safety regulations violations are now identified by analysing traffic recordings acquired by security cameras. The objective of this paper is to present a technique for detecting motorcyclists who are not wearing a helmet. In this research, we use a deep learning algorithm to develop a strategy for automatically detecting helmeted and non-helmeted motorcyclists. Motorcycle riders are recognised in this study using the YOLOv4 model, which is an incremental version of the YOLO model and is a state-of-the-art object recognition algorithm. The suggested model is tested on traffic videos, showing promising results when compared to existing CNN-based techniques.

Namit Kharade and Amrut Khatavkar

Integrated Database Management System for Emergency Services

Hansal M Shah, Aditya Shaulik Gandhi, Badal M Parmar,
Devam Jariwala and Dr. Nishant Doshi
Pandit Deendayal Petroleum University

India is the epitome of many emergencies where there arises a need for emergency services frequently. Vehicular accidents, thefts, injuries, riots, fire - breakouts, floods are some of the typical adverse situations that happen in India. According to Indian Healthcare statistics, 25.8% of victim deaths occur due to delayed response to the emergency or inappropriate management of the emergency services. In the medical field, there is a commonly used term, called the 'golden hour'. It is the first '60 minutes' following an emergency of a victim. Appropriate and fast response to the situation within this period decreases the chances of death and can save the life of the victim. It is a very critical period. Also, to overcome this issue of the late or inappropriate response of emergency services our IDMS can be used in any type of emergency to call the required services. It acts as a bridge between all the three pillars of emergency services namely police, medical, and fire. No such system is currently established in India which can keep track of all data related to all emergency services. The file management system cannot handle integrated data so, using IDMS for this data management can provide an easy and reliable method for processing data.

An Effective Keypoints Extraction Scheme for Image Tampering Detection

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School of Computer Sciences, Mahatma Gandhi University

Digital image security has become a key and challenging social issue with the advent of sophisticated image editing tools. Copy move forgery is one of the most common and malicious image tampering techniques. Numerous keypoints-based forgery detection have been proposed in the literature, however some algorithms address the problem of matched keypoints generation competency and performance. In this paper, an effective keypoints generation scheme is proposed based on SIFT features. A robust feature point generator is presented to extract enough keypoints. Moreover, an active extracting step is applied to estimate keypoints of small or smooth textured forged regions. Experimental results illustrate that the proposed keypoints generation scheme can generate more keypoints in terms of different scales and filter sizes.

Analysis of Effort Estimation for Test Suite using Control Graph

Babita Pathik

IET, DAVV

The software test estimation is a vital process for business prospects. The testing effort estimates with test case generation and execution time of test data. This paper evaluates the effort estimated for test cases by branch coverage on Control Flow Graph (CFG). Develop CFG for the programs, and extract all independent paths. The graph covers the information flow among all the classes, their methods, functions, and statements. Examine the number of test cases by assessing the cyclomatic complexity metrics of the graph. We also formed software test metrics with Halstead measurement on two different versions of a program. The empirical evaluation is portrayed on a segment of python code. Test efforts are analyzed on the additional test cases, and a comparative analysis is performed on testing effort estimated for the changed version of source code. This work aims to analyze testing efforts on old and modified versions of a program and measure the difference between the two. The experiment results show that the modified code regression test takes 0.791 sec less time than the complete test.

Early Fire Detection using Deep Learning

Akshad M Jha [1], Raj Walnuskar [1], Saurabh Vedak,
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With the recent advancement in vision-based automation and deep learning, design and development of an intelligent system for fire detection is getting attention of the researchers. Developing such system will improve the safety and efficiency of fire detection. System being intelligent would certainly reduce the human error and would lead to the improved accuracy as well. The main objective of this work is to create an automated system that is capable of generating real-time information about the presence of the fire. The aim of doing this work is to overcome the drawbacks of traditional firefighting systems. Authors have used deep learning techniques to achieve the said objective. To accomplish this, authors used Convolutional Neural Network (CNN) system to classify and identify objects of interest from thermal imagery in real time. This system is able to accurately inform the decision-making process of operators with real-time up-to-date scene information by extracting, processing, and analysing crucial information. The proposed system is having accuracy of 80% for detecting fire in given region while overcoming the false alarm generation.

An Interactive Alphabet and Number learning system using OpenCV and CNN

Anmol Tayal
Thapar University

The advent of technology and easy access to mobile devices in rural areas of India has opened a vast landscape of opportunities for education and teaching using tech. Children with learning disorders like Dyslexia find it extremely hard to learn Alphabet and numbers(A&N), and it can hinder a child's ability to interact with others. It is estimated that total 10 percent children in India suffer from dyslexia. Deep learning is being studied nowadays to overcome challenges in human health, and this paper proposes a pragmatic approach to leverage Deep learning Algorithms in teaching Numbers and Alphabets to Children. The Application, which was developed using the methodology described in this paper, introduces a smart way to have two-way interaction between the digital device and the student; the student gets Rewarded with points by drawing a similar Number or Alphabet as displayed on the screen using a blue, red-colored object; it also introduces different levels which seeds compulsion loop in the student. The Model harnesses the open-source OpenCV library to track blue, red coloured objects(Brobject) using Webcam and interprets the track produced using CNN to predict the A&N associated by implementing appropriate accuracy methodology. It utilizes Reward-based learning to trigger a compulsion loop in children, which could help make learning more interactive.

Daily Stock Price Direction Prediction using Random Multi-Layer Perceptron

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The stock market has always been a quick income source but involved great risks for its high uncertainty. Stock analysts use various fundamental techniques to predict its nature but the results haven't always been profitable. It is mandatory to have a secure prediction method to gain maximum benefits. In this era of automation, machine learning in data science is a valuable tool to predict the nature of the stock market conditions. The literature provides a variety of machine learning techniques such as SVM, AdaBoost, Regression, etc. This study proposes a novel technique called Random Multi-Layer Perceptron (RMLP) Classifier which divides the dataset into subsets and applies MLP on them individually. It predicts whether the closing price of the stocks of a particular firm will increase or decrease on the next day by considering the historical data of the firm's stocks as input. This technique gives an accuracy of about 78% which is greater than normal multi-layer perceptron in predicting the direction of the stock prices. The proposed method of RMLP is also compared with other existing methods of predicting the direction of the stock prices and promising results are obtained in favor of the proposed method.

Face Mask Detection Using Optimized CNN

Deepali Joshi, Adarsh Sharma, Shantanu Pingale,
Chanchal Sunil Mal, Sangeeta Malviya and Nikita K Patil
Vishwakarma Institute Of Technology

COVID-19 has had a rapid impact on people's lives, affecting global trade and transportation. Protecting against COVID-19 by wearing a face mask has become the new normal. Many public service providers will need clients to wear masks to access their services in the near future. As a result, in today's culture, face mask detection is essential. This study proposes attaining the aim by utilizing some basic platforms such as Machine Learning packages such as TensorFlow, Keras, and OpenCV libraries. The goal of this project is to reliably detect the face in an image and then determine whether or not the individual is wearing a mask. In addition, the model can detect the existence of a mask in real time. The mask detection dataset was compiled using Internet resources, and a Google form was constructed to collect photographs with and without masks. We examine optimum parameter values for the Sequential Convolutional Neural Network model in order to correctly detect the presence of masks without causing over-fitting. On camera or in real time, we want to see if a person wearing a face mask is actually wearing one.

A Novel Speech to Sign Communication Model for Gujarati Language

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Deaf Culture is important for deaf community as it is everywhere in the world. Deaf people are using Visual language (Sign language) for communicating. There are around 300 different types of sign languages available in the globe like British Sign Language, Indonesian Sign Language, American sign language, etc. Each sign language has its own syntax and semantics. Some sign languages are using one hand gesture, some are using two hand gesture as they have their own rules for communication. There is a need of one standard form of sign language so it will be easier to understand. There are so many challenges and problems are facing by deaf community. Different sign languages are provided different solutions for speech to sign language and sign language to speech conversion. As there is no solution is provided by anyone for Gujarati Sign Language, we proposed a one communication model for Speech to Sign language. Speech will be recognized and convert into text, text will give the HamNoSys Notation (Sign language Notation) from a database and then it converts in SiGML format and then it displays a sign animation (Avatar). That model will be helpful to Gujarat region deaf and dumb people for communicating with normal people.

Parts-of-Speech Tagger for Gujarati Language using Long-short-Term-Memory

Charmi K. Jobanputra, Vishwa Vora, Nihit Parikh and
Dr. Santosh Kumar Bharti

Pandit Deendayal Energy University

Parts-of-Speech (POS) tagging is a crucial step to process the natural languages. It is a process of assigning the lexicon category such as noun, verb, adjective, etc. to each word that best suits the context of the sentence in which it is used. Being a part of pre-processing makes this task an important step in linguistics and semantics. Gujarati is an Indian language widely spoken in Asia and across the world. Natural Language Processing (NLP) of Gujarati is in its early stage of existence. Information retrieval, machine translation, shallow parsing and word sense disambiguation tasks can be worked more effectively and efficiently with the help of a POS tagger. In this paper, we proposed Long-short-Term-Memory (LSTM) based POS tagger for Gujarati language. With our proposed approach, this paper envisions achieving accuracy of 95.34% and 96% precision with the help of this novel & efficient gradient based method.

AUTOMATED ATTENDANCE SYSTEM USING IMAGE PROCESSING

Ayush Kumar Dixit

MMIT

Automated attendance system is a system which will record the status of the student; whether he/she is present in the class. In this paper we propose an automated attendance management system. This system, which is based on face detection and recognition algorithms, automatically detects the student using web cam when he enters the class room and marks the attendance by recognizing him. The system architecture and algorithms used in each stage are described in this paper. Different real time scenarios are considered to evaluate the performance of various face recognition systems. This paper also proposes the techniques to be used in order to handle the threats like spoofing. When compared to traditional attendance marking this system saves the time and also helps to monitor the students

Prognosis of Sleep Stage Classification Using Machine Learning Techniques Applied on single channel of EEG signal of both Healthy Subjects and Mild Sleep effected Subjects

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Sleep is a basic requirement of human life. It is one of the vital roles in to the human life to maintain the proper mental health, physical health and quality of life. In this proposed research work, we conduct an automated sleep stage classification to proper investigation of irregularities occurred during sleep based on single channel of electroencephalogram (EEG) signal (SleepEEG) with using of machine learning approaches. The major advantage of this proposed research work over standard polysomnography method are: 1) it measures the sleep irregularities during sleep by considering two different medical condition subjects of different gender with different age groups.2) One more important objective of this proposed sleep study is that here we obtain different session recordings to investigate on sleep abnormality patterns, which can help to find better diagnosis towards treatment of sleep related disorder.3)In present work, we have obtained 15s time-framework epochs from individual subjects to check which window size is more effective towards identification on sleep irregularities. The present research work based on two-state sleep stage classification problem based on single channel of EEG signal were performed in different step-wise manner such as acquisition of data from participated subjects, preprocessing, feature extraction, feature selection and classification. We obtained the EEG data from ISRUCL-Sleep data repository for measuring the performances of the proposed framework, where the sleep stages are visually labelled. The obtained results demonstrated that the proposed methodologies achieves high classification accuracy, which support to sleep experts for accurately measure the irregularities occurred during sleep and also helps the clinicians to evaluate the presence and criticality of sleep related disorders.

Covid-19 Vaccine Tweets Sentiment Analysis and Topic Modelling for Public Opinion Mining

Pandit Deendayal Energy University

The world is facing the major crisis in the form of coronavirus pandemic. Since it's been more than a year of Covid-19 pandemic, there has been a significant call in social media regarding the requirement and feasibility for COVID-19 Vaccine. This paper aims at analyzing tweets related to Covid-19 Vaccine, determining the sentiments about vaccination and extracting the significant topics. We performed multi-class sentiment analysis, steps comprising of pre-processing followed by training three different classification models: Gaussian Naïve Bayes, Support Vector Machine and LSTM. Results of the model obtained was one the three (Positive, Negative, Neutral) sentiment. Based on the outcomes, accuracy and F1-scores were computed to draw comparison between distinct models. Topic Modeling was performed using LDA on the combined tweets dataset to derive top seven important topics. In addition, Exploratory Data Analysis was also performed on dataset consisting of Vaccination Progress worldwide to bring out popularity of vaccines.

Trisha K. Baldha, Malvi Mungalpara, Priyanka M. Goradia
and Dr. Santosh Kumar Bharti

A COMPARATIVE STUDY OF PADDY CROP STRESSES USING DIFFERENT MODELS

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Early management and on-time recognition of the stresses within the paddy crops at the booting growth stage is the key to forestall qualitative and quantitative loss of agricultural yield. The traditional paddy crop stress recognition and classification activities invariably rely on human experts identifying visual symptoms as a means of categorization. At present deep learning is a trending research area in pattern recognition. A framework to design Deep Convolutional Neural Network (DCNN) for automated recognition and classification of yield affecting paddy crop stresses using field images is proposed. Four different classifiers, the Convolutional Neural Network (CNN), pre-trained VGG-16, MobileNet and Inception V3 models have been deployed to distinguish biotic stresses such as Bacterial Leaf Blight, Fungal Blast and Brown Spot. The average stress classification accuracies of 92%, 95%, 85% and 98% have been achieved using the CNN, VGG-16, MobileNet and Inception V3 classifiers, respectively.

Blockchain-Based Crowdfunding: A Trust Building Model

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Smita P Bansod and Dhanashree Toradmalle
Shah & Anchor Kutchhi Engineering College

Blockchain-based crowdfunding is one of the new, upcoming alternatives to the traditional centralized approach to crowdfunding. Traditional crowdfunding platforms are vulnerable to data leaks, high transaction and platform fees, and rampant frauds which happens due to the anonymity of user's identity i.e., users cannot be identified when they commit cybercrimes. As blockchain is immutable and decentralized, it can reduce the possibility of data breaches. This brings in transparency as there is no central authority over the blockchain-based crowdfunding system. This paper attempts to solve these existing issues with the aid of a digital identity management system with an underlying Blockchain system. By implementing blockchain in a digital identity management system, malicious users can be identified and action can be taken against them. This paper explores donation-based crowdfunding using Ethereum as a framework and has been tested on the Rinkeby Test Network. This system can conduct several crowdfunding campaigns simultaneously. This paper explains the smart contract written in Solidity language in detail.

Hate Speech Detection using ML Algorithms

Aditya Razdan and SHRIDEVI S
VIT UNIVERSITY

Social media is a growing platform where different users share their ideas and sentiments towards different topics because users spend a lot of time expressing their thoughts and views. There are various research going on in detecting the sentiments of the user's comments but the main sentiment factor remains undiagnosed. In this paper, the aim is to detect hate speeches. The dataset was preprocessed and cleaned and cleaned text was explored to get a better understanding. Salient features were extracted from the data to train our model and to identify the hate sentiments of tweets. The vector model is created using genism to learn the relationship between words and based on that sentence are labeled. Stop words and port stemmer are used to filter unwanted data to build the vocabulary using CountVectorizer before it is used for model building. Using various machine algorithms, a comparative study is done to check the performance of algorithms and promising results are attained.

FACIAL SMILE DETECTION AND ACCURACY COMPARISON USING CNNs

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TKM College Of Engineering

Facial expression evaluation performs a key function in reading emotions and human behaviors. Smile detection is a unique assignment in facial features evaluation with numerous ability applications which include image selection, consumer revel in evaluation, smiling payment and patient monitoring. Conventional methods regularly extract low-stage face descriptors and discover smile primarily based totally on a robust binary classifier. In this project, we recommend powerful architectures of Convolutional Neural Networks (CNNs) to discover smile in real-time speed with excessive accuracy. A big dataset of gray scale images of human faces are used for the experiment. The architectures discover smiling faces and offers the accuracy as output. The output of the two architectures are in comparison to discover the one with the very best accuracy. The architectures used are Vgg16 and Improved Lenet-5.LeNet-5 indicates 92% accuracy and VGG-16 indicates 74% accuracy.

Application of Machine Learning for the Prediction of Liquid Holdup in Horizontal Multiphase Flow Pipelines

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Data Science is an emerging field that involves the use of advanced statistical and machine learning algorithms to discover information & relationships present in different types of data. Machine learning (ML) (a subset of Artificial Intelligence (AI)) can be used to run simulations, use data sets to discover patterns based on a variety of inputs and make cogent predictions. The oil and gas (O&G) industry can make use of ML in this way to test likely impacts of innovative developments or to gauge the environmental risk of a new project before any plans are made. This study focuses on the development of ANN model, a relatively new approach that has been applied successfully to a variety of complex engineering problems. This model was developed using the data available in literature and was used to predict the liquid hold-up in horizontal multiphase flow pipeline, which is a crucial parameter for the calculation of pressure drop in pipelines and in turn a key parameter for carrying out the design calculations of various equipment. The trained model and logic can be incorporated in any O&G or a chemical process industry by automating flow control or installing prediction systems in pipelines and field operations.

Blood Bank Management and Inventory Control Database Management System

Aman Ayan Shah, Daksh Chordiya, Devanshi Shah and Dev Shah
Pandit Deendayal Energy University

This paper presents a detailed approach for an efficient blood bank database management system. The database is the single most useful environment in which we store data and an ideal tool to manage, update and modify that data for a different perspective. The benefits of a well-structured blood bank database are infinite, with increased efficiency and time-saving benefits. Here, our motive is centred around this area. India faces a shortage when it comes to the amount of blood donated. The gap in demand and supply widened due to mismanagement and inefficient databases. We have modelled a well-organized database to try and reduce this gap. Alongside, we have developed an application that reminds donors when they become eligible again, gives locations of nearby blood donation camps, makes requesting blood easier for blood recipients etc. as well as promoting a healthy community. IoT is used for interlinking the application to the server as well as for inter-application communication. With the help of IoT, this collection and exchange of data become more efficient.

Exploring the effect of normalization on medical data classification

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NIT Raipur

Data normalization is one of the pre-processing strategies where the data is either transformed or scaled to make an equal contribution of each attribute. For a given classification problem, the performance of any machine learning approach depends upon the quality of data in order to produce a generalized classification approach. Various studies have shown the significance of data normalization to enhance the quality of data and finally the performance of machine learning techniques. But there is dearth of investigations about the effect of data normalization methods in classifying the medical datasets. Thus, this study intends to explore the effect of three data normalization techniques namely min-max, z-score and Median and Median Absolute Deviation on the performance of four classification algorithms namely Naïve Bayes, Support Vector Machine - Radial Basis Function, Random Forest and k-Nearest Neighbour. The experiments conducted on 20 publicly available medical datasets are based on the classification accuracy as performance parameter. The best performance results were obtained with z-score normalization method along with Random Forest classifier.

A Comprehensive study of Machine Learning Techniques used for estimating State of Charge for Li-ion Battery

Chaitali Mehta, Dr. Paawan Sharma and Amit Vilas Sant
Pandit Deendayal Energy University

Electric Vehicles (EVs) are making more and more financial sense as the operational cost of EV as compared to Internal Combustion Engine Vehicles (ICEV) is becoming much lower. To further increase the confidence of users in EVs precise State of Charge (SoC) estimation is need of the hour. The SoC of a battery depends on several factors such as current, voltage, age, temperature, etc. SoC estimation of a Lithium-ion based battery chemistry is highly complex process. This is due to the fact that Lithium-ion batteries are highly nonlinear, time variant and complex electrochemical system. A comprehensive study of SoC estimation techniques based on Machine Learning algorithms used in Battery Management Systems (BMS) is performed in this paper. Machine Learning algorithms are highly data driven and can give accurate estimation for nonlinear systems. A critical explanation including pros and cons of all these algorithms is presented. The paper also suggests future developments in BMS.

Enhanced Demand Forecasting System For Food and Raw Materials Using Ensemble Learning

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Food wastage and raw materials deterioration are the most noteworthy predicaments faced by any food selling business. To avoid wastage, the restaurants should have prior knowledge of the amount of food required. Several solutions with the help of AI have been compounded to solve this problem of food wastage. Nevertheless, much of this research concentrates on the prediction of sales and its accuracy. It is important to note that sales prediction itself wouldn't be enough to decrease food wastage. Predicting the number of raw materials required also plays a crucial role in reducing food wastage. Therefore, in this paper, a demand forecasting system is proposed that predicts the number of customers, sales for particular dishes, and the amount of raw materials required. Stacking technique is used in the proposed model for making the predictions. This model has been evaluated with the help of MAE metric and it ranges from 0.2 to 0.7. The proposed system will help the restaurant cook dishes and buy raw materials without wastage.

Dementia Prediction Using OASIS Data for Alzheimer's Research

Rahul B Diwate
VIT

The role of data science and machine learning in the medical field has increased manifold in recent years. However there lies a vast scope in conditions like dementia. Complex machine learning models are in place to analyze brain images but these fail to perform on numeric biological and social data of the patients. This work analyses the longitudinal brain data of patients collected by OASIS for Alzheimer research. A graphical analysis is performed on the data and several conclusions regarding dementia have been drawn. Multilayer Perceptron and Decision Tree both provided an accuracy of 0.839 and a recall of 0.836 and 0.800 respectively thereby providing the most efficient model for dementia prediction. Machine learning models can help predict dementia using social and biological data of patients to a fairly accurate degree without the requirement of brain MRI images.

LSTM-Based Prediction of COVID-19 Vaccination Drive in India

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The vaccination drive for the much dangerous and contagious Coronavirus (COVID-19) has started successfully in India. This paper proposes to predict the vaccination drive of COVID-19 using the time series data for India. The proposed model was used for predicting the number of people to be vaccinated once per day in the country. The proposed model was compared with the direct input-based Long Short Term Memory (LSTM) cell model using various performance parameters and the proposed model was found to perform better. The actual closeness of the model's prediction from the actual data was depicted through line graphs. The proposed model was further used to predict the short-term and long-term future values. Herd immunity is another key ongoing research area when it comes to COVID-19. The Herd Immunity Threshold (HIT) of COVID-19 has not been found yet. However, this paper has proposed the expected number of days for different population thresholds. The proposed model predicts 174 days for obtaining a population threshold of 50% and 319 days for obtaining a population threshold of 90%.

Automatic Satellite Image Stitching Based on Speeded Up Robust Feature

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The process of merging multiple images those having overlapping areas and covering different views of the same scene into a composite image is called image stitching. Image stitching can be used in variety of applications such as computer vision, medical image analysis, satellite imaging, photogrammetry etc. Image stitching also used for creating mosaic images which is useful for extending the field of view of the image. Image stitch are generally classified into direct image stitching and feature based image stitching. In this paper we proposed a feature-based satellite image stitching using Speeded Up Robust Feature (SURF) algorithm. SURF mainly involves two steps, feature point detection and feature description. Detected feature points of input images are compared using nearest neighborhood matching for identifying the overlapping points. Affine transformation-based image warping is used for aligning the input images to the mosaic frame. Finally, alpha blending is used for making the final mosaic as perfect smooth image.

Analysis of LoRa framework in IoT Technology

Rohini b Khanderay

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Low Power Wide Area Network (LP-WAN) technology discovered their utilization within the IoT (IoT) structures because of their low energy intake and long-range, with low statistics costs as a compromise. One of the maximum applied LP-WAN technology that operates in unlicensed spectrum is LoRa (Long Range). The description of different LP-WAN technology (Narrowband IoT, Sigfox, and LTE-M) and their evaluation with LoRa are supplied within the paper. Operating in an unlicensed spectrum makes the opportunity of the interference grow, that's treated via way of means of LoRa's chirp unfold spectrum modulation. In LoRa communiqué, spreading factor (SF) has the maximum effect on electricity intake, time on air, and insurance area. Influence of the SF on communiqué parameters including sign-to-noise ratio (SNR), acquired sign power indicator and time on air is analyzed the use of over 6500 LoRa messages accumulated within the check community in Croatia. The evaluation effects confirmed the dependencies among SF, RSSI, and SNR and among theoretical value and the measured one.

Inner Voice - An effortless way of communication for the physically challenged deaf and mute people

Vaishnavi Jamdar, Yogita D Garje, Manikrao Dhore,
Trupti Khedekar and Sneha Waghmare
Vishwakarma Institute of Technology, Pune

Communication, which is the basis of human development, often tends to be an obstacle for those physically challenged people that are unable to speak and articulate their thoughts. During a conversation between a hearing and speech impaired person and a normal person the difficulty of communication hampers the comfort level. Inner voice works as a daily communication tool for those that have trouble speaking. For better communication, it allows users to voice their needs and feelings quickly and simply in a picture-based communication app. It is a portable, fitted, and easy-to-use communication tool designed to reduce the communication gap.

RFID Automatic Bus Ticketing System

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Vishwakarma Institute of Technology, Pune

Public transport is one of lowest cost and therefore most dependable mass transit systems in India. Bus services are a common mode of public transportation. Throughout India, travel is extremely important. During emergence within recent years, the use of public transportation has become more prevalent in daily life. People are increasingly relying on public transportation to go about to workplace, schools, clinics etc. The far more common issue in bus services is indeed the distribution of bus tickets, this further frequently results in a dispute as between the rider and the conductor. Taking that into consideration, we're going to build an automatic bus ticketing system in which RFID cards were used to improve the process. This would be an easy-to-use device that automatically deducts the traveler's payment depending on the distance travelled. The traveler is authenticated via a Radio Frequency Identification (RFID) card, which allows for extremely exact transactions. When comparing paper-based vs RFID-based systems, RFID cards are frequently a superior alternative because they are rechargeable. RFID cards are issued to the general public. By obtaining data and information, a distinct profile will then be generated. RFID cards are being used to grant ID to each individual. As a result of having access to this database, this becomes feasible to detect and verify your passenger's profile and make a withdrawal. The android-based application is used to get the count of passenger travelling in a day which will help the conductor to check total tickets costing in a day.

Design and Simulation of Two-Fingered Soft Robotics Gripper

Juvith Ghosh and Naresh Himadri

University of Bristol

Growth of the field of robotics and automation is one of the rudimentary causes for the rapid industrialization and the reduction of cost and time of production of the complex products. The reason behind the growth is the task handling skills and the repeatability of the same task with higher level of accuracy and precision by the robots has overpowered the human labors in various scenarios. For the task handling, the soft robotics grippers made up of soft and smart materials are in high demand to handle more delicate objects without damaging them. The reason behind the soft materials-based gripper is that they are less power consuming, handles delicate objects, and has high dexterity and longevity. With this motivation the experiment was designed to lift the soft objects even like strawberries using the developed Two Fingered soft robotics gripper which is simulated in the VOXCAD and tested the ability to lift the object in a simulated environment and the viability to work in real world. As the field of soft materials has achieved a massive development in the past decade it is been used many applications like production sectors, space applications, agriculture, etc.

COVID-19 Outbreak from the Experience of Wave 1 and start of Wave 2: Comparison and Analysis

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and Babita D. Sonare

PCCOE

COVID-19 has proved to be one of the greatest outbreaks the world has ever seen. COVID-19 is a respiratory disease, whose fatality varies from person to person depending on factors like age group, weakened immune system and many more. To date, it is believed that the world is fighting the second wave of Novel Coronavirus disease. The first case was observed in Wuhan, China, on December 31st, 2019, and in India, the first case was reported on January 30th, 2020. In this paper, we will be analyzing the data of daily active cases, comparing the 1st and the 2nd wave of the coronavirus in India. The data is collected from December 2019 to May 2020 (1st Wave) and from June 2020 to April 2021 (2nd Wave). We will be using the Machine Learning, Linear Regression model for comparison, and through a series of graphs, we will study how differently each wave hit India. There are 2 datasets for 2 phases, and we have compared them in this paper.

Market Basket Analysis using A-Priori and FP-Tree Algorithm

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Market Basket Analysis is used for many applications like online marketing, recommendation engines, information security, etc. Over the past few years, it has been one of the hot topics among research groups as its widely used e-commerce site to recommend related products or arrangements of layouts on the basis of frequently purchased items in supermarkets and fixing consumer index price as per consumer's demands. In this paper, we have focused on two widely used market basket analysis algorithms i.e. Apriori algorithm and FP-growth algorithm. This paper mainly compares these two algorithms and compares the efficiency on the basis of database sizes, time complexity and space complexity. As a finding of comparison of these two algorithms we discovered that the Apriori algorithm required more time complexity while Fp-growth required more space complexity. Apriori algorithm can be used when there are no time constraints but low space available whereas FP-growth Algorithm used for low time constraint as it uses tree repeatedly to add new types of transactions to reduce time complexity.

Sangeeta Kumari

A stealthy evasive information invasion using covert channel in mobile phones

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The proliferation of mobile devices and widening technological advancements have led the world to potential repercussions of insecurities. This brings in the most intrinsic requirement of security in mobile devices that may have crucial information like contacts, messages or payment passwords. However, the rapid advancements and technological vulnerabilities have created a space for these threats to get unnoticed from detection mechanisms like reverse engineering. Covert channels that either disrupt the information flow or thwart the flow in order to sidestep the detection mechanisms and leak sensitive information have been discovered in mobile devices also. The paper depicts an attack PCEII utilizing one of such covert channels and evasive mechanism to bypass the detection mechanisms like reverse engineering, data and control flow tracking a malware detection tools. The current research discusses the malicious approaches of such Covert channels based evasive attacks, their operation, research gap and its solution in detail. Also, it open up an area for defense against covert channels to be incorporated in state-of-art tools.

Innovative Game Based Educational Application for Learning

**Yahya M H I Asadi, Gagan Babu, Shubham Poojary
and Savitha A Shenoy**

SMVITM

Video games, a multi-billion-dollar industry is one of the most rapidly-growing industries in the world. With game-based learning becoming a growing trend among teachers and children to make play and learn go hand in hand. Researchers have demonstrated that games have the potential to create a learning environment for better achievement of educational and training goals. In this paper we study a game we have developed, that teaches even a layman the basics of science, commerce, arts or any other respective field and life lessons. The main objective of our application is to make learning fun and competitive even for a layman. This application not only makes learning fun but also keeps the user engaged with learning by competing with friends in multiplayer mode. Multiplayer games have good market in gaming industry. Current educational games don't have consistent user base, the plan is to create a multiplayer mode which will keep the users engaged with the game on every day basis to learn new things about the respective fields they are interested in.

Intelligent Rover: An IoT Based Smart Surveillance Robotic Car For Military

**Safa Mohammed Sali and Joy K.R.
Sahridaya College Of Engineering and Technology**

Intelligent Rover is a military based surveillance robotic car that is trained to detect human beings and weapons while moving according to the user need. Intelligent Rover is controlled via smart phone and uses raspberry pi and Arduino to achieve the mission of the rover. It captures live video using picamera and streams it, which can be viewed from a webpage. The camera can be swiveled horizontally and vertically. Intelligent Rover employs yolo V3 algorithms to detect weapons and persons individually. When it detects any objects, it notifies the user via an email. The DC motors connected to the wheels sets the rover into motion that is controlled through the webpage from smartphone or any other devices. This robotic automobile is also capable of detecting metals via sensors and notifies the same to the user via email.

Neural Network Based Detection of Driver's Drowsiness

Shraddha Bhandarkar, Tanvi Naxane, Sayli Shrungare
and Shivani Rajhance

International Institute of Information Technology

The primary purpose of this paper was to propose a way to alert sleepy drivers in the act of driving. Most of the traditional methods to detect drowsiness are based on behavioral aspects while some are intrusive and may distract drivers, while some require expensive sensors/hardware. Therefore, in this paper, driver's drowsiness detection system is developed and implemented to aid drowsy drivers from falling asleep and to prevent accidents. The system takes images from the device as input. Using these image templates, the trained model starts execution and predicts/classifies whether the face of the person in the image is drowsy or alert. The proposed model is able to achieve accuracy of 99.93% using CNN on trained image dataset.

Smart glove-An IoT-Cloud Based Health Monitoring Wearable glove For Covid Patients

Hafsiya T H
Sahridaya College Of Engineering and Technology

The greatest emergency confronting the planet nowadays is that the corona virus or covid 19. most of the individuals inside the Indian country are exceptionally conventional individuals. Numerous tests for Covid 19 are costly and past the reach of the commonplace individual. With the entry of the novel Crown Infection, each nation presently places awesome significance on wellbeing care. So, this year, the only arrangement for such plagues is that the IoT-Cloud cloud-based wellbeing checking framework. the internet may be a breakthrough in inquire about, particularly inside the field of healthcare. With the multiplication of valuable sensors and smartphones, this inaccessible wellbeing care checking has created at such a pace. IoT wellbeing monitoring helps to halt the spread of the infection and to create an exact conclusion of the patient's wellbeing condition though the specialist is absent. amid this paper, the convenient physiological checking system are attending to be shown, which can be able to always check the patient's beat , temperature, blood oxygen level and crucial sign , since the most side effects of coronavirus are tall fever, weakness and trouble breathing. Exchanges sensor data on to the IoT cloud utilizing Wi-Fi. Any MQTT conventions utilized within the IoT cloud to supply clients with unmistakable and time-bound sensor information. This information is unquestionably available to most shrewd terminals utilizing a browser . The camera moreover can screen the patient's wellness .It's a continuous check and control gadget to see the patient's condition and store the patient's data on the cloud cloud server, too as farther correspondence backed the Wi-Fi module. bolstered these values accomplished by authorized people with get to to information put away on any IoT stage, the farther wellbeing observing framework utilized by IoT remotely recognizes patients utilizing the versatile / tablet application.

Predicting the Presence of Amphibians Near Road Construction Sites Using Emerging Machine Learning Algorithms

Ipsita Goel, Siddharth Goradia and Kakelli Anil Kumar
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The construction of dense road networks exerts a drastic influence on the persistence of amphibian species inhabiting the adjacent areas. Preventing any arising conflicts between nature conservation and urbanization is vital. We suggest an efficient system to predict the existence of amphibians in the vicinity while constructing roads and planned infrastructure projects. This model uses the XGBoost framework. Moreover, we implement various classification techniques such as XGBClassifier with GridSearchCV and without GridSearchCV, Naive Bayes Classifier, Decision Tree, KNN Classifier, SVM, and RidgeClassifier and compare their performances. Comparative review of these classifiers shows that XGBClassifier with GridSearchCV outperforms the other classification algorithms with high accuracy. The factors thus identified should be taken into account for sustainable urban planning.

COVID-19 County Level Severity Classification with Imbalanced Dataset: A NearMiss Under-sampling Approach

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University of the District of Columbia, Washington DC

COVID-19 pandemic that broke out in the late 2019 has spread across the globe. The disease has infected millions of people. Thousands of lives have been lost. The momentum of the disease has been slowed by the introduction of vaccine; however, some countries are still recording high number of casualties. The focus of this work is to design, develop and evaluate a machine learning county level COVID-19 severity classifier. The proposed model will predict severity of the pandemic in a county into low, moderate, or high. Policy makers will find the work useful in the distribution of vaccines. Four learning algorithms (two ensembles and two non-ensembles) were trained and evaluated. Class imbalance was addressed using NearMiss under-sampling of the majority classes. The result of our experiment shows that the ensemble models outperformed the non-ensemble models by a considerable margin.

ExOpSum: An Extractive Opinion Summarization methodology based on aspect-sentence-review ranking

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With the evolving web technology, anything you need can be purchased online. With these purchases, the feel of the purchase is also recorded in the web portals in the form of user generated comments and feedbacks. The unlimited pour of opinions on the web has now paved way for automated sentiment analysis of opinionated text. Furthermore, in this fast-paced world, humans don't find time to stand and stare, hence an automated opinion summary is the need of the hour. Summary should include highly ranked aspects, highly ranked sentences and highly ranked reviews. Also, the emotional touch of customers can be deliberately seen only through extractive summarization, which is the core objective of our work. The mathematical computational model designed for our work has proven to work better than the existing work on extractive summarization.

Land Cover Classification from Satellite Data using Machine Learning Techniques

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This work attempts automatic land cover classification of different parts of India into forest, built-up, agricultural land and water bodies using temporal remote sensing data. Data from Agra district, Uttar Pradesh has been used to train different models - k-nearest neighbours, decision trees, support vector machines and convolutional neural networks. These models are then tested in Ahmedabad and Gandhinagar, Gujarat. Google Earth Engine has been used to obtain data from Landsat 8 satellite images. For the purpose of classification, Normalized Difference Vegetation Index (NDVI) values are calculated by masking all other light bands except near-infrared and red light bands. Temporal images with NDVI labels are fed as input to train the models and subsequently, the performance of these models is compared. A convolutional neural network based on the U-Net architecture is found to produce the most accurate results, improving upon traditional machine learning techniques. The models implemented can be used to produce land cover maps for any region, with good accuracy, which can then be used for various applications like natural resource management, urban expansion etc.

IOT BASED SORTING MACHINE USING MQTT PROTOCOL AND MYSQL

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M MANOJ KUMAR
Army Institute of Technology

The growing demand for faster production while maintaining the quality of the product has given scope for technology to take over the materialistic industry. One such technology used is the internet of things to automate, connect and exchange data with other devices. Our project makes use of this technology to create an automatic colour sorting machine which not only sorts the objects according to their colour but also stores and exchanges data with devices. The colour sensor is used to detect the colour; servo motors are used in the segregating process. Node Micro Controller Unit (NodeMCU) coordinates the sensor, actuator which also sends the data to the cloud through its inbuilt Wireless Fidelity (Wi-Fi). The user is provided with an interface by which he can easily visualize the data at any time of the day. The machine has high reliability and compatibility making it ideal for both small and large scale industries.

Improving Machine Learning based Groundwater Level Estimation using Geological Features

Abhi N Lad, Khushali B Patel, Soumya C and Yash Solanki
Pandit Deendayal Energy University

Estimation of Groundwater level is crucial for managing water resources. Forecasting of groundwater level changes can help in determining efficient utilization of groundwater resources and drive water conservation efforts, especially in arid regions. Existing works have used machine learning techniques to estimate groundwater level using meteorological data. However, they have restricted the scope of their research to areas with abundant continuous timeseries data. In this paper, we aim to address the issue of sparse data in estimating groundwater level. We expand the input parameters to incorporate geological and demographic data along with traditional meteorological data. We have collected data of Kutch region in Gujarat, spanning 11 years with varying availability of data at monitoring sites. Using techniques like Random Forest Regression and Neural Networks, we are able to improve the estimation of groundwater level as compared to using traditional features. We also analyze causal effects of different values of Geological parameters by extending concept of treatment effect and provide interpretability of the estimation models. The results presented here indicate that factors like soil type and depth are important in estimating groundwater level and can improve performance on sparse timeseries data. The treatment effect analysis also provides results which conform to existing knowledge thereby bridging the semantic gap between domains of computer science and hydrogeology.

An Efficient Bit Depth Reconstruction from the Micro-Shifted Image

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An initial shifting of the pixel values by a microshift pattern has shown a very important impact on uncertainty range reduction while reconstructing the original bit depth of the pixel values from the quantized pixel values. Based on an in-depth examination of the influence of microshift pattern on uncertainty range reduction, paper proposes an improvement in bit accuracy reformation from the micro-shifted image based on maximum a posteriori (MAP)probability.

Original image pixel values are rotated by a microshift pattern, and then assigned to the values. A framework to infer the original bit depth from these fewer bits is presented in this paper. The uncertainty range in the reconstructed image is reduced by jointly combine the acquired quantized pixel values. The experimental results indicate that our proposed method significantly outperforms the competing methods.

Computer Vision enabled Adaptive Speed Limit Control for Vehicle Safety

Abhi N Lad, Prithviraj Kanaujia, Soumya C and Yash Solanki
Pandit Deendayal Energy University

Over speeding, especially by heavy vehicles, is the major cause of accidents in India. This can be attributed to lack of framework to maintain strict adherence to road safety rules. This leads to heavy vehicles occupying high speed lane which in turn leads to frustration and rapid lane switching among passenger vehicles. With the recent advancements in Computer Vision and IOT, it is possible to enforce such safety rules without the need of on ground personnel. In this paper, we have proposed an IoT based solution for vehicle speed control which uses computer vision to detect the lane and dynamically limit the speed of the vehicle, thus discouraging higher speeds of certain vehicles on specific lanes. We have manually labelled ~1.2 lakh images of TuSimple lane dataset for training the models. We have provided CNN models as baseline and also use a pixel counting based SVM method for detecting lanes which achieved CNN levels of accuracy while being computationally efficient. Our proposed solution aims to automate the regulation of speed on per vehicle basis, which can be very effective in reducing the number of accidents in India.

Analysis of Various Clustering Algorithms to Enhance Bag-of-Visual-Words for Drowsiness Prediction

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Bag-of Visual-Words is a technique used to create image vocabularies which describes the best image features. The construction of visual vocabulary is done using various clustering techniques. This work concentrates on various clustering techniques that can be implemented on Bag-of-visual-Words technique so that to analyse the accuracy of vocabulary creation. The clustering techniques such as K-means, Minibatch K-means, Mean-shift, DBSCAN and OPTICS are implemented individually to record the efficiency of the model. Features from the input images are extracted using Scale Invariant Feature Transform(SIFT) matched with Fast Library for Approximate Nearest Neighbors(FLANN). Drowsy images are classified based on the occurrence of the visual words. The comparison result indicates that the OPTICS clustering algorithm work well with Bag of Visual Words to output an accuracy rate of 79.01%.

Real Time Emotion Analysis (RTEA)

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Recognizing human emotion in real-time is one of the most challenging and powerful tasks in telepsychology. Neural network-based emotion recognition gives a better performance than simple image processing. This project presents the design of a deep learning system that is capable of detecting human emotion through facial and speech emotion recognition. This paper proposes a CNN or convolution neural network-based deep learning. It also discusses the application of human emotion recognition for the purpose of telepsychology. Mental health professionals are provided with real-time emotional data of their patients for better treatment. For the purpose of the project, two datasets are used. One is for facial emotion recognition called AffectNet Database and the other is The Ryerson Audio-Visual Database of Emotional Speech and Song (RAVDESS) for speech emotion recognition. The accuracies achieved with the proposed model are 63 and 77 percent, respectively.

Internet of Things Security: Attacks, Solutions, Strengths and Limitations

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Internet of Things (IoT) has become an intangible part of regular life over the past decade. There are innovations in new wearable smart devices to various domestic appliances on a very regular basis. But IoT devices owing to the intricacy they have with our daily lives also usually store a large amount of sensitive data making IoT devices target large information security attacks. In this article, we have attempted to accumulate various security threats that IoT devices can face and the current landscape of research on countermeasures for the same. Later, we have presented a contrast to analyse the difference between major security frameworks and their efficacy. The research is further concluded on examination of potential research dimensions, scope, and related challenges in multiple research aspects.

Biomarkers Identification for Parkinson's Disease using Machine Learning

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Neuro degenerative diseases such as Alzheimer's disease or Parkinson's disease starts developing at an early age however symptoms are demonstrated quite late. Parkinson's disease is a neuro degenerative disease with a brain neuron loss causing shaking, stiffness and difficulty in motor movements. These symptoms worsen over time as the disease progresses. Computational biology and bioinformatics domains have witnessed advancement with the development of powerful methods to collect, process and analyze health informatics data such as molecular-genomic, proteomic ,transcriptomic data revealing hidden patterns. Several machine learning techniques are widely used to mine the voluminous data with large feature space. Biomarkers identification process using machine learning helps to detect the minute changes that might have occurred at the molecular level. This paper presents preliminary work of identifying biomarkers using machine learning for Parkinson's disease through differentially expressed genes. The dataset GSE54536 - Gene Expression Omnibus is obtained from Gene Expression Omnibus repository and pre-processed. This pre-processed data is used to construct a linear model indicating disease states. Then least square regression along with statistical tests such as t-test and fold change are used to identify differentially expressed genes. Total 8 differentially expressed Parkinson's disease genes-TLR10, OSBPL10, FCRLA, MS4A1,FOS, FOSB,EGR1,SLC11A2 are recognized.

A review on Human Activity Recognition

Jigar Shah

Pandit Deendayal Energy University

Human activity recognition(HAR) and the forecast is nowadays among the few advance application of AI and machine learning. HAR is used in Healthcare assistance systems, Security surveillance, gaming industries etc. In this paper, we look into challenges in this field and also try to get thorough knowledge of HAR architecture. We also compared different machine learning techniques like K-nearest neighbor, Convolution neural network, recurrent neural network, Hidden Markov model, Support Vector Machine, random forest, naive Bayes etc. different Datasets have been taken from various sensors, camera, gyroscope, accelerometer etc.

Diabetes Prediction, using Stacking Classifier

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Pandit Deendayal Energy University (PDEU)

Diabetes is a disease, which occurs due to excessive blood sugar. It has become very common nowadays. It is dependent on various factors of the human body such as Blood Sugar Level, Weight, etc. We have used one benchmark dataset, PIMA Indians Diabetes Dataset, for training and testing our model. For predicting diabetes at an early stage using the risk- based features of a person's health, we have developed a stacking classifier, and for the same, we have stacked 6 classifiers, namely Support Vector Machine, Artificial Neural Network Classifier, Logistic Regression Classifier, Decision Tree Classifier, Random Forest Classifier and Gaussian Naive Bayes Classifier, into a single model, which as a whole, uses Logistic Regression Classification on these 6 basic hyperparameter tuned models. Also, we have compared these 6 basic models with the stacked model in terms of performance. The results obtained are satisfactory and effective in comparison to the results of already proposed methods. We have achieved accuracy of 82.68%. The results of this model will add value to additional reports, because studies on prediction of diabetes using Stacking doesn't seem to be common, in comparison with other Machine Learning Techniques.

Malware Analysis using Ensemble Techniques: A Machine Learning Approach

Sachin Sharma and Dr Santosh Kumar Bharti
Pandit Deendayal Energy University

The impact of malicious software is getting worse every day. Malicious software are programs that are created to harm, interrupt or damage computers, networks and other resources associated with it. This software is transferred in computers without the knowledge of owner. Malwares have always been a threat to digital world but with a rapid increase in the use of internet, and with introduction of concepts like SaaS and PaaS that are encouraging business giants to setup up their empire virtually, the impacts of the malwares have become severe and cannot be ignored anymore. Though lot of malware detectors have been created by security researchers; the accuracy and efficiency of these detectors depends upon the techniques being used. Malware creators are not idle either, they create new techniques and challenges in regular interval of time that makes existing techniques outdated. In this paper, insights of malware analysis in static manner are provided and at later stage, machine learning approach is implemented to obtain nearly accurate results.

Simulating the Cognitive Thought Process with a Modified Genetic Algorithm

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Cognitive Computing is a developing paradigm with its applications found in almost every field. It aims to develop computing methodologies and systems inspired by mind's capabilities. A thought is the most fundamental capability of the mind. Hence it is important in the cognitive computing to understand the Thought Process. The purpose of this paper is to develop a computer model that simulates the Thought Process. The paper proposes that the Genetic Algorithm (GA) can be used for the same. Both cognitive model and computer model of the thought process with the help of GA has been given. In the computer model, a modification of GA has been implemented, which consists of a new crossover operator called Learning Crossover operator. The new crossover operator is not a replacement but is a supplement to the existing crossover operators. The GA is implemented over the Travelling Salesperson Problem (TSP), which is a classical NP problem and hence the algorithm is possible to be implemented on any other problem. The modification to the GA aims to improve the Thought Process Simulation. But it can also improve the performance of GA, when further explored.

Modelling Veracity of Football Player Trade Rumours on Twitter Using Naive Bayes Algorithm

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Twitter today has become one of the most influential social media application in our world. Twitter is a source of a plethora of data contributed by its millions of users. Twitter is a popular choice for journalists reporting about football to disseminate information about impending player transfers. Football has become very popular amongst people and draws a lot of social media engagement towards news of player trading. This has unfortunately given rise to several "in the know" social media accounts that propagate fake news to exploit fundamental flaws in social media ranking applications. This paper attempts to gather data about specific words most commonly used during the period of a player transfer occurring and model it using the Naive Bayes algorithm to determine whether a player transfer has occurred given the choice of words expressed in a tweet whilst comparing its results to models in use for detecting the veracity of transfer rumours.

Machine Intelligence-Based Reference Evapotranspiration Modelling: An application of Neural Networks

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After inventing Artificial Neural Networks, a deep learning algorithm, simulation of hydrology and water resource-related problems become more efficient. The investigation aimed to discover an efficient Artificial Neural Networks (ANN) model for obtaining weekly reference evapotranspiration (ET₀) in the Tirupati region. Air temperature (T), Sunshine hours (S), Wind speed (W) and Relative Humidity (RH) are among the climate variables commonly utilized to evaluate the ET₀. Multiple and partial correlation analyses were performed between the ET₀ calculated by the Penman-Monteith (PM) method (PMET₀) and these variables by deleting one variable each time to determine the most impacting variable, RH, W, S, and T were found to be impacting variables in the order of lowest to highest. As a result, the most desirable ANN model (ANN ET₀) was created using all the variables as inputs and eliminating one of the least influential variables each time to assess ET₀. The ANN models are developed and validated using climatic data from 1992 to 2001. The model's ability was evaluated using numerical indicators and scatter & comparison plots by matching the PM ET₀ to the ANN ET₀. The numerical indexes are employed to validate the usefulness of the generated models. The ANN (1-5-1) considering one input variable (T), ANN (2-5-1) considering two input variables (T & S), ANN (3-4-1) considering three input variables (T, S, & W), and ANN (4-3-1) considering four input variables (T, S, W, & RH), were found to have 83.53%, 89.85%, 94.21%, and 99.30% efficiency during the validation, respectively. Therefore, the ANN models may accurately predict the weekly ET₀ in the research area and elsewhere in climatological situations similar to the study area.

YouTube Content Analysis For Hair Extension's Business

Aditi Gupta, Astha Kawatra, Mitali Mishra
and Chaitali Chandankhede

MITWPU

From 2018 to 2024, the global hair extension market is projected to grow by 8%, reaching more than \$5 billion. Hair care was the second-largest segment in the global beauty industry in 2017, accounting for 18% of total sales, after skincare. A big driver of this market is the need to enhance one's physical appearance which most of the times are affected by any hair loss diseases like cancer, alopecia, pregnancy, thyroid, and so on. Endorsing wigs and hair extensions is becoming increasingly common on social media. Specialty shops, hair salons and beauty stores, and hair clinics account for a large portion of the sale of hair wigs and extensions. Our system provides a unique analytical view for solving problems of customers by helping them choose amongst various brands of hair extensions. It does this by using the video's content to perform sentiment analysis rather than just focusing on public comments on the videos. It also performs statistical analysis and provides an overview about the best channels and influencers. To give a better decision base to customers, the paper focuses on providing content extraction of various YouTube videos covering fashion influencers' reviews as well as common people's reviews and for the investors, insights of market trends to judge its potential.

Deep Convolutional Neural Networks for Scene Understanding: A Study of Semantic Segmentation Models

Yanvi Soni, Priyanka M Goradia, Malvi Mungalpara,
and Trisha K. Baldha
Pandit Deendayal Energy University

Semantic Image Segmentation for autonomous cars is gaining a lot of popularity in recent times with researchers trying to improvise the model as much as possible. In this paper, we have compared three models, UNet, VGG16_FCN and ResNet50_FCN, which are used for semantic image segmentation. We have trained and tested these models on the cityscape dataset where the models classify each pixel of the image into various classes. Results show that the class-wise accuracy of ResNet50_FCN is more than the other two models. We have also plotted IoU graphs for each model and we found out that ResNet50_FCN and VGG16_FCN have much better scores than the UNet model. Based on these results, we have shown that ResNet50_FCN outperforms the other two models for the case of semantic segmentation for scene understanding.

Plant Disease Prediction and classification using Deep Learning ConvNets

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A country's inventive growth is dependent on the agricultural sector. Agriculture, the foundation of all nations, offers food and raw resources. Agriculture is hugely important to humans as a food source. As a result, plant diseases detection has become a major concern. Traditional methods for identifying plant disease are available. However, agriculture professionals or plant pathologists have traditionally employed empty eye inspection to detect leaf disease. This approach of detecting plant leaf disease traditionally can be subjective, time-consuming, as well as expensive, and requires a lot of people and a lot of information about plant diseases. It is also possible to identify and classify plant leaf diseases using an experimentally evaluated software solution. Currently, machine learning and deep learning are using in various sectors. The agriculture sector is also not a exception for machine learning. In this paper, we proposed a deep learning approach "Convnets" for plant disease detection and classification. We collected a PlantVialge dataset from Kaggle. It contains images of 15 different classes of plant leaves of three different plants potato, pepper, tomato. We divided the dataset into three datasets and applied Convnets on three datasets. We achieved an accuracy of 98.3%,98.5%,95% for potato plant disease detection, pepper plant disease detection, tomato plant disease detection. Experimental results have shown that our model achieved a good accuracy rate for plant disease detection and classification.

A Deep Learning based approach to predict Human Activities in Real-Time

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RV College Of Engineering

Human Activity Recognition (HAR) is a technique for categorizing a person's activity utilizing sensitive sensors that are impacted by movement. Smartphone users are increasing, and users often take their phone with them. As a result of these factors, HAR has grown in importance and popularity. Activity recognition is the issue of anticipating the development of an individual, in view of sensor data. Multi-sensor based methods that use at least three sensors attached to various areas of the human body and in varying locations depending on the activity are used to recognise human actions. The data collected from the accelerometer, gyroscope and magnetometer sensors on cell phones is organised to perceive human activity. In terms of efficacy and accuracy, the consequences of the techniques used are examined. In this work, we propose a lightweight activity identification computation based on Long Short Term Memory structures, which may incorporate highlights from raw sensor data.

Visual Perception Stack for Autonomous Vehicle Using Semantic Segmentation and Object Detection

Tarun Tiwari

MVJ College of Engineering

An autonomous vehicle requires a reliable system for high vehicle precision and relative estimation of its state for the safety of humans during the autonomous movement of the vehicle in an environment dominated by human drivers. Such systems have a complex environment involving multiple sensors (e.g. Vision modules, Global Navigation Satellite System (GNSS), LIDAR, RADAR). Through this paper, environment perception stack for self-driving cars is proposed to improve the intelligence for decision making and improve the safety measures. Semantic image segmentation, based on Fully convolutional Network architecture is implemented and the output received from the model is then used for implementing 3D space estimation and lane estimation. Considering the real-time cooperation required between the autonomous vehicles and other vehicles in the frame, a 2D object detector is implemented on the stack to detect different classes of objects and their relative distances are calculated. The proposed system is then implemented on the CARLA simulation software and generated outcomes are further discussed in the paper.

Efficient vaccine scheduler based on CPU scheduling algorithms

Vasu P Gondaliya, Shreya Manish Patel, Jay Hemnani and
Dr. Samir B. Patel

Pandit Deendayal Petroleum University

This paper presents an efficient algorithm for scheduling vaccination process which is based on the CPU scheduling algorithms of an operating system. Based on a custom-designed scoring system of the given schedule, an analysis of why the first-come, first-served basis of scheduling vaccines is inefficient. The ranking system is based on the concept that health care personnel should be given higher priority, followed by front-line workers, major healthcare patients, elderly people, and finally the general public. This is the category in the dataset, the higher the importance of the person who needs to be vaccinated, the better the score. Different CPU scheduling methods are analyzed based on Arrival Time, Turn Around Time, Waiting Time, and Response Time. We obtain the resultant schedule after providing the dataset, the number of vaccines per day, and the selected algorithm for scheduling, and we get a customized schedule based on the data by entering the Aadhar number. The FCFS and Priority algorithms were compared to visualize the differences in efficiency for both algorithms, as well as an analysis of how many vaccines to choose per day and the related length of schedule in days.

Analysis and Application of Regularized Neural Networks in Smart Agriculture

Abhinav Thapper, Aditya Kulraj Kunwar, Ashutosh Raturi
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Delhi Technological University

Crop related services like fisheries, sericulture hubs, animal husbandry, and agriculture, that is, traditional farming methods, play a highly vital role in the progression of the economies of the developing third world countries and are also responsible, to some extent, for the current status of the so-called developed countries. Good crop choice is a vital parameter that is directly proportional to the amount of yield of a particular crop a farmer gets in an agricultural year. Poor crop selection patterns that are not per external factors like rainfall, temperature, humidity, etc. lead to detrimental outputs and yields, which may even be a factor to some length, in the increasing debts that the Indian farmers are in for the past 8 years. Thus there are direct consequences of bad crop selection and poor yield to the social, economic, and mental wellbeing of the farmer. The Indian agriculture industry is heavily at the mercy of climate in different parts of the year. To this view, over the past years, many different Artificial Intelligence-based techniques have been introduced to try to revolutionize the farming industry in some way. These techniques come under the banner of Precision Agriculture. Concepts used in precision agriculture include Ensemble models, KNN based models, Similarity-based frameworks and many other techniques to mitigate traditional problems in farming. Along the same lines of thinking, we discuss in this paper, a regularized ANN-based method to better recommend crops based on selective factors like rain and temperature.

Analysis of Image Forgery Detection Using Canny Edge Detector

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PCET's PCCOE

As now-a-days many image processing software and editing tools are available using which image can be easily faked. In various fields digital images are used as legal evidence, for forensics investigations, so there is need of making such system that can detect image forgery. The passive approach of image forgery detection provides image authenticity without having any information about the image. Further in this paper we have discussed various pixel based techniques which are used for creating forgeries in the image. We proposed an optimized method that can detect the forgery in the image using k-means and feature matching algorithm which uses canny edge detector. It gives recall between 85 to 90% and precision 100%. We run this system over two datasets.

Recommendation and Prediction of Solar energy consumption for smart homes using machine learning algorithms

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Gautam Nahar, Sheetal Sonawane and Archana Ghotkar

Pune Institute of Technology (PICT)

Solar Energy systems are an important source of renewable energy generation. Solar intensity is directly proportional to solar power generation and solar power generation is highly dependent on weather fluctuations. A model is proposed that predicts the amounts of solar power generation using weather data provided using various machine learning techniques such as Gradient boosting, SVM, etc. The results allow us to make effective energy consumption plans for smart homes with efficient utilization of solar energy which may provide several economic benefits. Additionally, accurate forecasts would make users more prepared to switch between conventional and renewable sources as required. A comparison study is performed with various machine learning models to determine the best method for building a prediction model. The groundwork for constructing models that could be dispatched to various regions is laid out that will incorporate that geographic location's weather data, and output accurate solar intensity predictions for that area. Furthermore, a recommendation system is proposed for the consumption of thus predicted energy.

COVID-19 Based Semantic Search Using Sentence-Transformers

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Every day, a huge number of COVID-19-related research papers or journals are published. It is impractical for health-care workers to read entire research papers and articles in order to keep pace with new information. In this work, the researchers deployed a semantic search engine that utilizes different sentence transformer models. The sentence transformer models in this research include BERT, DistilBERT, RoBERTa, ALBERT and DistilRoBERTa. These models begin by collecting COVID-19-related research papers and are used as an input to the pre-trained sentence transformer models. In this research, these models first collect the research papers and then are converted into embedded paragraphs and the input query is sent to the same model, which in turn delivers the embedded query. The model uses cosine similarity to compare both embedded paragraphs and the embedded query. As a result, it returns the top 10 most similar paragraphs, together with their paper ID, title, abstract, and abstract summary. The bidirectional nature of the sentence transformer models allows them to read text sequences from both directions, making the text sequence more meaningful. Using these models, the researchers developed the best COVID-19 semantic search engine.

IMPLEMENTING A REAL TIME COVID-19 FACEMASK DETECTION WITH DEEP LEARNING AND COMPUTER VISION

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PADMAJA, A DHEERAJ and A S G KUMAR
LENDI INSTITUTE OF ENGINEERING AND TECH

The corona virus COVID-19 epidemic is causing a global health crisis so the effective protection method is wearing a face mask in public areas according to the World Health Organization (WHO). The COVID-19 pandemic forced governments across the world to impose lockdowns to avert virus transmissions. Reports indicate that wearing facemasks while at work places clearly reduces the possibility of transmission. An efficient and economic approach of using deep learning in order to generate a safe environment in a manufacturing setup. A hybrid model using deep and machine learning for COVID-19 face mask detection will be introduced. A face mask detection dataset consists of two sets of images labelled as with mask and without mask, we are going to use OpenCV to do real-time face mask detection from a live stream via our webcam. We use the dataset to build a COVID-19 face mask detector with computer vision using Python, OpenCV, Tensor Flow and Keras. Our goal is to identify whether the person is wearing a face mask or not in a web cam with the help of computer vision and deep learning.

Dangerous Object Detection for Visually Impaired People using Computer Vision

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Pandit Deendayal Energy University

In this contemporary world, Artificial Intelligence and Machine Learning are one of the leading technologies creating an impact in the world by mimicking human behaviour to solve a particular problem. Hence, these technologies are widely used to aid different obstacles encountered by humans. One such problem widely faced by the mankind is visual impairment. According to World Health Organization, approximately 285 million people suffer with vision impairment. Therefore, applications of machine learning and computer vision can be applied to guide the people with such problems. This paper presents the idea of using object detection to aid the visually impaired people. In this paper, an experiment has been proposed which uses a custom-built image dataset of various dangerous objects. The objects have been categorized into 5 broad categories: Sharp objects, Danger signs, Broken glass, Manhole and Fires. A number of different algorithms have been trained on this custom image dataset containing the menacing objects and their performances have been evaluated. The evaluation indicators for the models are the validation error in terms mean Average Precision (mAP) and the processing time for each model. The models have also been tested in real world scenario by evaluating on a custom video to gauge their performance in terms of accuracy in detection of different objects as well as their ease in deployment by suggesting their frame rate handling capacity. The results are discussed and the most robust and balanced model is suggested at the end of the paper.

Histopathological Cancer Detection using Deep Learning

ANEESH R KHANDELWAL
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- Deep learning is a sophisticated machine learning technique that teaches machines what to try and do that comes naturally to humans like understanding patterns and recognizing, analyzing things. Nowadays, health care has become an associate trade that uses deep learning the foremost. Deep learning intending offers pathbreaking applications. Deep learning gathers a vast volume of information, together with patients' records, medical reports, and insurance records, and applies its neural networks to produce the most effective outcomes. During this paper, The Deep learning model is projected that detects cancer exploitation histopathological scans of bodily fluid nodes. This will be useful to society as timely detection and alert system for sleuthing cancerous tendencies.

Facial Features Analysis for Autism Detection using Deep Neural Network

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Autism is a developmental disorder which is neurological in origin. It is distinguished as difficulty for social interaction, having repetitive behavior. Autism is scaled at much larger extent in population which is around 2.47%. Children with autism tends to be having intellectual disability and they avoid social interactions, which impacts on their education and employment opportunities. Many of the children with autism requires lifelong support and care. Due to diverse nature of children with autism it is difficult to easily diagnose it. Early diagnosis and intervention is necessary to facilitate life of autistic children. Autistic children have different facial patterns than normal children. These features can be used to diagnose Autism Spectrum Disorder (ASD) and also we efficiently relate diagnosis to its severity. Deep learning and computer vision helped medical field to diagnose cancerous tumors, broken bones, MRIs etc. Strength of both can be used to early and cost effective diagnosis of Autism. As autism is behavioral in nature, its diagnosis is subjective, time consuming and needs special expertise. It is found that autistic children have few facial deformations which can be adapted for diagnosis. In this paper, ResNetV2 based approach is proposed for early detection of autism on the basis Kaggle Autism image dataset. Performance comparison is done with CNN and MobileNetV2. It is found that ResNetV2 outperforms these algorithms and validation accuracy is 86% and training accuracy is 96%.

FORECASTING ELECTRICAL DEMAND FOR THE RESIDENTIAL SECTOR AT THE NATIONAL LEVEL USING DEEP LEARNING

Pavan Kumar Dharmoju, Karthik Yeluripati, Jahnavi Guduri

and Kowstubha Palle

Chaitanya Bharathi Institute of Technology

A fundamental element of power-system planning is estimating electricity demand at the national level. However, given the residential sector's trend of rapidly fluctuating energy consumption, it's challenging to achieve these targets in the residential sector, which is the main source of peak demand. While deep learning methods have lately demonstrated success in a variety of time series studies, its relevance to forecasting monthly household energy demand has yet to be thoroughly investigated. The forecasting model for this paper used is long short-term memory (LSTM); it has proven itself to be successful in deep learning-based time series forecasting problems. A compilation of data on social and weather variables spanning 42 years in the United States of America was used to validate the proposed model. In addition, the performance of this model was compared to the performance of three benchmark models. According to all of the metrics used, the proposed model performed exceptionally well. This model will make power-system planning effective and improve grid efficiency by properly anticipating the future energy demands of the residential sector.

Formal Verification based Security Testing for Healthcare Dapp using Ethereum Smart Contract

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This paper focuses on making use of Blockchain technology features to enhance and improve the current medical sector. Healthcare is one sector in which blockchain is having outstanding and noteworthy impacts. It will address the issues in real-time, without exposing the channels to theft. Proposed system utilizes the characteristics and features of Blockchain technology in the Healthcare sector to reduce the malpractices during the transactions and provide a more efficient and secured way of executing medical insurances by using Ethereum Smart Contract. Before giving treatment to any patient, the doctor must know the previous data of the associated person. So, in a proposed system we look forward to creating a platform where the previous records of the Patient cannot be viewed without his/her approval, Only Doctors can view the Patient's basic medical information in case of emergency. Based on these requirements proposed system develops a distributed healthcare application by considering all requirements of stakeholders involved where all digital transaction are stored in the form of blocks over a blockchain. The proposed system uses behavior and scenarios based Behaviour Interaction Priorities (BIP) framework of Model checking method for formal verification of the healthcare distributed application to prove security to achieve a high level of confidence in the correct behavior and runtime safety of healthcare Dapp.

Selective Lossy Image Compression for Autonomous Systems

Yatharth Ahuja and Shreyan Sood

Delhi Technological University

The main objective of this paper was to effectively interface object detection based on Convolution Neural Networks (CNNs) with selective lossy image compression techniques to improve the efficiency of subsequent image operations and reduce the memory requirement for storing the images in autonomous applications of self-driving vehicles. Object detection and localization was performed using 2 state-of-the-art CNN based models from the Tensorflow 2.0 Object Detection API - Faster R-CNN ResNet152 V1 1024x1024 and CenterNet HourGlass104 1024x1024. Lossy Image Compression centred around the most prominent detected object (which is preserved) is done through 3 techniques – K-Means Clustering (KM), Genetic Algorithm (GA), Discrete Cosine Transform (DCT). The compressed and preserved parts were recombined to produce the final image. Analysis of the results obtained from different models and compression techniques was carried out. It was found that DCT produced the best results on both the models.

Intelligent system for detecting intrusion with Feature bagging

Debabrata Swain

Pandit Deendayal Petroleum University

Cyber-security has received considerable attention as a result of individuals and businesses' enormous impact on the Internet and their concern about the security and privacy of their online activities. Due to this, predicting cyberattacks with machine learning has become crucial as the number of attacks has risen dramatically as a result of attackers' stealth and sophistication. To maintain situational awareness and achieve defense in depth, collecting cyber threat intelligence requires the use of machine learning for threat prediction. With the increasing use of technology, intrusion detection has become a flourishing field of study. It monitors and alerts users to their typical (or) anomalous behavior. IDS is a nonlinear and challenging task that entails analyzing network traffic data. The purpose of this article is to examine the potential of employing machine learning approaches to forecast malware attacks. The objective is to foresee the types of network attacks that may occur. To demonstrate our work's usefulness, we employed a random forest approach to learn the assessment dataset. This is where the random forest comes in handy.

Assistive Navigation System for Visually Impaired and Blind People: A Review

Noopur Tyagi, Deepika Sharma, Jaiteg Singh, Bhisham Sharma and Sushil Narang

Chitkara University

The emergence of modern technologies in healthcare systems like the Internet of Things, Wireless Sensor Network, Machine Learning, etc. has ameliorated the cognitive abilities of humans. The increased accessibility of healthcare data and the exponential growth of advanced analytics can be attributed to the innovative amalgamation of these technologies. These technologies have adaptive and self-correcting capabilities to enhance accuracy depending on the information. Assistive technology enables independence and attainment of quality of life for blind and visually impaired people. With the support of guided navigation tools, assistive technologies aid the people with the facility to move across inside as well as the outside environment. The major concern of a visually challenged and blind person is to live a life with quality and safety. This study contributes information about distinctive wearable and portable assistive tools and devices which are designed to provide support to visually impaired people. Also, it was revealed that traditional navigation devices lacked a few features that are crucial for independent navigation. To overcome those navigation deficiencies, IoT technology is exploited to provide better solutions. Global Positioning System (GPS) tracker can assist to discover several opportunities in numerous areas such as location detection, mapping, healthcare, security, etc. Navigation gadgets embedded with sensors have a huge variety of programs and benefits. The major objective of this comprehensive study is to showcase a clearer perspective about the wearable or embedded devices used by visually impaired or blind persons.

Edge, Fog and Cloud-based Smart Communications for IoT Network based Services & Applications

Karan Bajaj
Chitkara University

The Internet of Things is increasing its span in our daily life, intelligent homes, agriculture, industries and smart cities are few popular fields among application areas. Use of smart devices connected over the network can be seen in the mentioned fields. Vast data is collected through the connected devices using wireless sensors and then transmitted over the network to the edge and cloud for the computation. The increase in sensory devices lead to more data generation thereby there is also raise in wireless terminals as now more data is generated. This brings some challenges that need to be resolved, like processing delay leading to more time consumption, data bandwidth issues affecting data transfer rate and computation capability. It has been identified that massive work needs to be researched on communication medium to provide IoT services among the applications. Various frameworks like TelcoFog, Edge framework, CoSMOS, ROUTER, FogFlow, Deep Learning and IoTecture were studied and their results were analysed. This paper aims to understand the role of different communication channels for edge/fog and cloud-based computing, and understand their role in different computation methodologies.

An Intelligent Approach for Prediction of Children Suffering through Learning Disabilities: A Survey and Discussion

Shailesh P Patil

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Literacy is a tool to progress in path of life. With reading, writing person can explore himself in society. Students having learning disabilities are lagging in academic progress. Learning gap between students with disabilities and normal student increases. These students becomes less motivated with time, gets obstacle in continuing education and struggle in range of less employment. Students suffering through these disabilities often have emotional patterns like frustration and low self-esteem. Learning disability like dyslexia is major problem which is around 10 to 15% of total population. Early diagnosis and assistance of learning disability will be helpful to asses these students and give them remedial solutions. Research on these disabilities is going on from decades. Approaches with audio-visuals, paper-pencil, gaming approach etc. provided for prediction as well as assessment of learning disabilities in students. In this paper various approaches for prediction and assessment of learning disabilities are discussed. Prediction from hand-written text, brain imaging and electroencephalogram (EEG) are complex and requires expertise and hardware setup. Contrary to this, prediction on the basis of eye movement is scalable, accurate and easy to adapt. In this paper an approach for prediction of dyslexia from eye movement with the use of webcam is discussed. Webcam based approach is cost effective and doesn't require extra hardware setup. Inclusion of machine learning gives more precise and robust solution.

COVID-19 Exploratory data analysis and disease prediction using deep learning

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In biomedical sciences, data mining skills are used to research and provide predictions to aid in the identification and classification of diseases. Controlling the spread of Corona Virus Disease requires screening a high number of reported cases for effective isolation and treatment (COVID-19). Pathogenic laboratory testing is the scientific gold standard, but it is time-consuming because of the high rate of false-negative findings. To treat the illness, there is an urgent need for rapid and dependable diagnosis techniques. We aimed to develop a deep learning system capable of extracting COVID-19 graphical features from CT images utilising COVID-19 radiographic improvements. In earlier study investigations, machine learning methods were employed in the prediction and categorization of COVID-19. This research, on the other hand, concentrates on the different effects of certain image processing techniques rather than on optimising these processes through the use of improved approaches. The CT image dataset benefits from the extraction of classified correctness. The DeTraC model, a previously published convolutional neural network architecture based on class decomposition, is used in this study to increase the performance of pre-trained models in detecting COVID-19 instances from chest X-ray pictures. This may be accomplished by including a class breakdown layer into the pre-trained models.

Automatic Sleep Stage Scoring on Raw Single-Channel EEG : A comparative analysis of CNN Architectures

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Dwarkadas J. Sanghvi College of Engineering

Medicine has long reached an overwhelming consensus on the importance of sleep in maintaining mental and physiological homeostasis, and the link that sleep disruption has with both disease and mortality. With the advent of the domain of HealthTech, Deep Learning approaches have generated State Of The Art performance in solving several problems in the medicinal arena. The study of sleep-Polysomnography- uses Electroencephalogram (EEG) readings, among other parameters, to gain a clearer picture of a patient's sleep patterns since different brain activities correspond to different stages of sleep. Monitoring and interpreting EEG signals and the body's reactions to the changes in these cycles can help identify disruptions in sleep patterns. Successfully classified sleep patterns can in turn help medical professionals with the prognosis of several pervasive sleep related diseases like sleep apnea and seizures. To address the pitfalls associated with the traditional manual review of EEG signals that help classify sleep stages, in this work, several Convolutional Neural Networks were trained and analysed to classify the five sleep stages (Wake, N1, N2, N3, N4 and REM by AASM's standard) using data from raw, single channel EEG signals. With PhysioNet's Sleep-EDF dataset, this comparative analysis of the performance of popular convolutional neural network architectures can serve as a benchmark to the problem of sleep stage classification using EEG signals. The analysis shows that CNN based methods are adept at extracting and generalizing temporal information, making it suitable for classifying EEG based data.

Deep Hybrid Learning Method for Classification of Fetal Brain Abnormalities

Kavita R Shinde

Pimpri Chinchwad College of Engineering

In recent years, lot of work has been carried out to develop a computer automated system to identify brain disorders. In the study and research of fetal brain disorders MRI images plays vital role. From the study of several literatures it is observed that existing machine learning techniques for the classification of fetal brain MRI are complex, time consuming and facing the problem of over-fitting. In the proposed system Deep Hybrid Learning (DHL) method is used for classification of fetal brain abnormality. In this work, the fusion of Deep Learning technique with the conventional machine learning method has been carried out in order to obtain the good classification results. The aim of this research work is to improve the performance results in the classification of fetal brain abnormality using MRI images. The classification layer of Deep Neural Network (DNN) architecture is replaced by Random Forest (RF) machine learning classifier. The experimental results obtained from DNN+RF model are compared with the results of simple DNN and DNN+SVM framework. It shows that the proposed system achieves the good classification result. The DNN+RF has an Area Under Curve(AUC) of 94% and 87% for training and validation respectively which is better than the state-of-arts method. The paper is concluded with challenges and possible future directions.

Efficient sea water Purification using Hybrid Nanofiltration system and ML for Optimization

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The Earth has an abundance of water, about 70 percent of the globe is covered with water, wherein only 2.5 percent of freshwater is available for human usage. Due to the major issue of over-population and lack of pure water bodies, the problem of pure water scarcity has reached it's peak. Hence, there is a demand of a system wherein efficiently pure water can be processed and there is a smooth flow of pure water. We have proposed a model which is cost-effective, environmental friendly, and responsive to the limitations of existing desalination and filtration plants making it an absolute system. The proposed model is 3 layer hybrid system, which is interconnected and is sequential. The system is a combination of sedimentation, amyloid carbon hybrid membranes and graphene oxide technology for complete purification of seawater. This paper presents a comparison between the existing techniques with our proposed model resolving better aspects. Additionally, the paper consists of the laboratory tested results of seawater, groundwater and tap water and by the analysis of that result we have shown the amount of purification required for seawater. As membranes are very sensitive and it is needed to change with time, we have proposed the machine learning approach which will look after the saline water which is coming inside the system and will keep track on water quality of incoming water. Also, we will use supervised algorithms and computer vision which will keep watch on membranes and will give alert when there is need to clean the membrane which will reduce the chance of changing them frequently. And hence this ai technology will increase the efficiency of the model.

3D Modelling using Sequential and Convolutional Generative Adversarial Networks

Apoorv Kakade, Mihir P Deshpande, Suyash Nitin Sardeshpande
and Varad Suhas Thokal

PICT

We propose a novel solution for solving a specific problem of generating realistic and varied 3D models for target objects. Existing processes for 3D modelling involve human inspection of CAD models and borrowing parts from them. There have been inspiring advances made by 3D GANs that generate highly varied object shapes but do not adequately attend to objects that are symmetrical or have limited CAD models available as a training data-set. .The benefits of the novel model developed by us are threefold : first, it generates realistic shapes by understanding underlying geometry of objects using a limited training data-set; second, it outperforms the 3D-GAN when generating symmetrical 3D object shapes ; third, it bridges a research gap by delivering a solution that requires minimal training time and computational resources.

ChaDRaL: RGB Image Encryption based on 3D Chaotic Map, DNA, RSA and LSB

Nirali Sharad Parekh and Lynette D'Mello

Dwarkadas J. Sanghvi College of Engineering

In this paper, ChaDRaL, an RGB image encryption algorithm based on Chaos, DNA, RSA and LSB is introduced. ChaDRaL leverages the advantages of symmetric and asymmetric cryptography as well as steganography. On one hand, the image is first encrypted using a symmetric algorithm that combines DNA sequence operations and Lorenz chaotic system. On the other hand, the secret key which is used to encrypt the image is now itself encrypted with an asymmetric algorithm i.e. RSA. Lastly, this encrypted key is concealed in the cipher image using LSB steganographic scheme. As a result, the problem of key transfer is also eliminated. The proposed encryption approach is tested over different well-known images that are taken from the USC-SIPI image database. The suggested method's security analysis reveals little correlation among image pixels, high entropy, and uniform distribution in histogram of cipher image. Also, it shows considerable performance in terms of established metrics such as UACI, NPCR, PSNR and SSIM. The simulation results show that ChaDRaL can achieve good encryption and resist attacks like statistical attacks and differential attacks. This combination of both steganography and cryptography results in increased authority and security.

House Price Prediction using Advanced Regression Techniques

Dr (Mrs) Shakti Mishra

PDPU

Real estate has been a significant industry since the time of post World War . This industry has largely been a part of the national economy for a country. In the bigger picture, this industry incorporates multiple aspects of the property, which includes development, selling, leasing, and management of industrial, commercial, residential properties. The sale price of a real estate property depends on many factors. For instance, the total square feet of the house might directly affect its sale price. There are numerous factors that determine the price of a property. Using econometric models or regression techniques we can predict the price of a property based upon certain features. In this paper, we try to predict the sale price of the residential properties using Advanced Regression techniques and determine what features most affect the sale price. We have employed various feature engineering techniques to be applied to the raw data to make it productive for the machine learning models. An approach is discussed for understanding the black-box machine learning models and interpretations are made using techniques like partial dependency plot. Such prediction models can be used in real-life scenarios to estimate the price of a property. It can help buyers and sellers estimate the prices and allow them to fairly negotiate based on the predicted prices of the house/property. We can commercially deploy the model using software applications that will aid buyers in getting a fair price for a property.

All Applications of Generative Adversarial Network in Image Enhancement

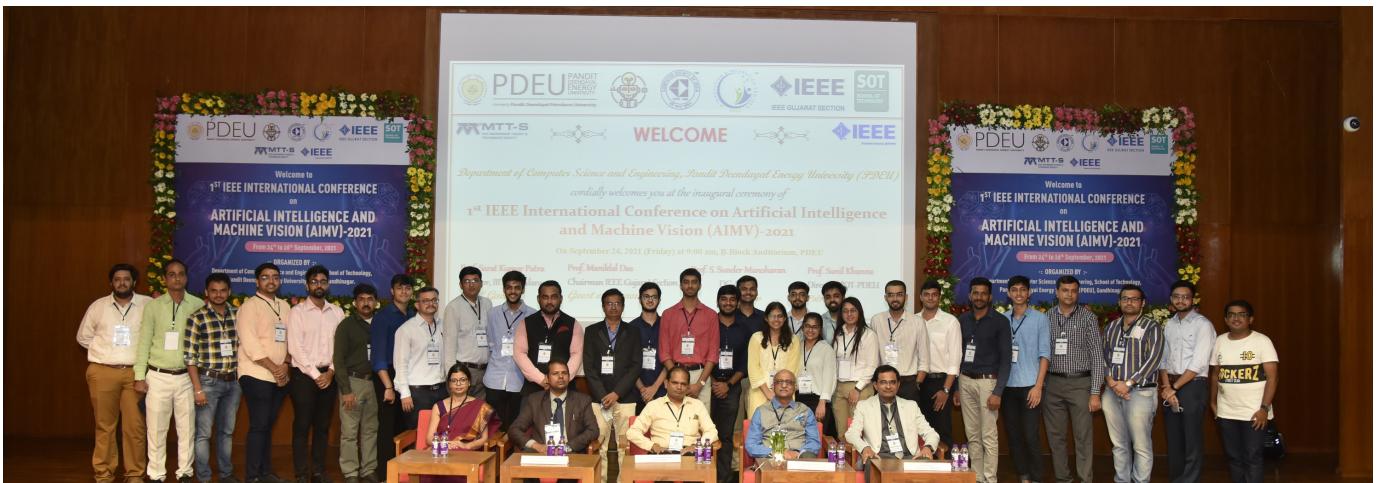
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Generative Adversarial Network (GAN) has proved to be a powerful mechanism in various practical applications where data generation is required for testing and verification. In image enhancement which is one of pre-processing step in image processing, images are processed to improve quality of low-quality images so that they can fulfil requirements of various advanced perceivable tasks. Such Image enhancement tasks require a lot of images to implement training algorithms for better results. However, already built datasets are available to be used in most cases but sometimes these are not enough in some fields such as Underwater images and medical images. In recent years, GANs are emerged as generative model which can increase data volume and make training better for neural networks. Not only for data generation, GANs are better in feature learning than traditional machine learning algorithms. Various advancements in basic GAN in terms of loss functions, architecture have been devised to give better results in image enhancement. In this paper, we have given basic theory and mathematical formula of GAN and summarized applications of GANs in enhancement of different kinds of images. Finally, future directions in this field are given.



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