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PYTHON – ML, AI, NN, IP, DL BASED PROJECTS ABSTRACTS

IGTM01 - Sentiment Analysis of Top Colleges Using Twitter Data

ABSTRACT - In today's world, opinions and reviews accessible to us are one of the most critical factors in formulating our views and influencing the success of a brand, product or service. With the advent and growth of social media in the world, stakeholders often take to expressing their opinions on popular social media, namely twitter. While Twitter data is extremely informative, it presents a challenge for analysis because of its humongous and disorganized nature. This paper is a thorough effort to dive into the novel domain of performing sentiment analysis of people's opinions regarding top colleges in India. Besides taking additional preprocessing measures like the expansion of net lingo and removal of duplicate tweets

IGTM02 - Efficient Masked Face Recognition Method during the COVID-19 Pandemic.

ABSTRACT - The COVID-19 is an unparalleled crisis leading to huge number of casualties and security problems. In order to reduce the spread of coronavirus, people often wear masks to protect themselves. This makes the face recognition a very difficult task since certain parts of the face are hidden. A primary focus of researchers during the ongoing coronavirus pandemic is to come up with suggestions to handle this problem through rapid and efficient solutions. In this paper, we propose a reliable method based on discard masked region and deep learning based features in order to address the problem of masked face recognition process. The rest step is to discard the masked face region. Next, we apply a pre-trained deep Convolutional neural networks (CNN) to extract the best features from the obtained regions (mostly eyes and forehead regions). Finally, the Bag-of-features paradigm is applied on the feature maps of the last convolutional layer in order to quantize them and to get a slight representation comparing to the fully connected layer of classical CNN. Finally, MLP is applied for the classification process.

Experimental results on Real-World-Masked-Face-Dataset show high recognition performance

IGTM03 - Automatic License plate recognition using ANN

ABSTRACT - Automatic Plate Recognition plays an important role in intelligent transportation systems. However, most license plate recognition methods work under restricted conditions like slow speed and good illumination. That is a restriction on industrial application. In this thesis, the constraints are relaxed by vanished points distortion-recovery method and denoising method. This thesis implements a license plate recognition method by morphological edge detection method and convolution neural network recognition method. The thesis is constructed contributes to several papers optimization methods. The proposed approach can be trained for recognition of country-specific license plates. More than 500 images are collected for training and over 300 images are collected for recognition test. This paper achieves 97.05% on license plate recognition for detecting total characters and numbers of the license plates. License plate recognition consists three parts, pre-processing image, locating license plate and identifying license numbers and characters. License plate location is important to obtain license images and plays a key role in identifying plates. The plate recognition has two major steps, character separation and identification. In this paper, machine learning method is applied for license plate recognition.

IGTM04 - Automatic Detection of Diabetic Retinopathy: A Review on Datasets, Methods and Evaluation Metrics

ABSTRACT -Diabetic retinopathy (DR) is a fast-spreading disease across the globe, which is caused by diabetes. The DR may lead the diabetic patients to complete vision loss. In this scenario, early identification of DR is more essential to recover the eyesight and provide help for timely treatment. The detection of DR can be manually performed by ophthalmologists and can also be done by an automated system. In the manual system,

analysis and explanation of retinal fundus images need ophthalmologists, which is a time consuming and very expensive task, but in the automated system, artificial intelligence is used to perform an imperative role in the area of ophthalmology and especially in the early detection of diabetic retinopathy over the traditional detection approaches. Recently, numerous advanced studies related to the identification of DR have been reported. This paper presents a detailed review of the detection of DR with three major aspects; retinal datasets, DR detection methods, and performance evaluation metrics. Furthermore, this study also covers the author's observations and provides future directions in the field of diabetic retinopathy to overcome the research challenges for the research community.

IGTM05 - Indian License Plate Recognition Using Convolutional Neural Networks (CNN)

ABSTRACT -In the last few years, the deep learning technique in particular Convolutional Neural Networks (CNNs) is using massively in the field of computer vision and machine learning. This deep learning technique provides state - of-the-art accuracy in different classification, segmentation, and detection tasks on different benchmarks such as MNIST, CIFAR-10, CIFAR-100, Microsoft COCO, and ImageNet. However, there are a lot of research has been conducted for Bangla License plate recognition with traditional machine learning approaches in last decade. None of them are used to deploy a physical system for Bangla License Plate Recognition System (BLPRS) due to their poor recognition accuracy. In this paper, we have implemented CNNs based Bangla license plate recognition system with better accuracy that can be applied for different purposes including roadside assistance, automatic parking lot management system, vehicle license status detection and so on. Along with that, we have also created and released a very first and standard database for BLPRS

IGTM06 - Handwritten Character Recognition using CNN

ABSTRACT Many localized languages struggle to reap the benefits of recent advancements in character recognition systems due to the lack of substantial amount of labeled training data. This is due to the difficulty in generating large amounts of labeled data for such languages and inability of deep learning techniques to properly learn from small number of training samples. We solve this problem by introducing a technique of generating new training samples from the existing samples, with realistic augmentations which reflect actual variations that are present in human hand writing, by adding random controlled noise to their corresponding instantiation parameters. Our results with a mere 200 training samples per class surpass existing character recognition results in the EMNIST-letter dataset while achieving the existing results in the three datasets: EMNIST-balanced, EMNIST-digits, and MNIST. We also develop a strategy to effectively use a combination of loss functions to improve reconstructions. Our system is useful in character recognition for localized languages that lack much labeled training data and even in other related more general contexts such as object recognition.

IGTM07 - Recognition of handwritten text using long short term memory (LSTM) recurrent neural network (RNN)

ABSTRACT -Handwriting recognition is a technique which is used to produce machine readable text from a given text image. The hand written text is captured as an image from mobile. Handwritten characters are usually recognized with Optical Character Recognition (OCR) scanners. But with the large usage of mobile phones, detecting text from mobile camera has plenty of applications such as medical script processing, exam script evaluation etc. Camera image has lot of noises when compared to the OCR scanned images. Therefore, the image is pre-processed to reduce noise using image processing techniques such as binarization, thresholding and etc. The letters are segmented and extracted from an image. The features such as binary codes are extracted from the letters.

The neural network classifier is built using Long Short Term Memory (LSTM) network which is trained using an already built character dataset. The neural network is used to test the input images. The output is provided as a text document with the recognized words. Since the input feed is obtained from images, the noise will be high compared to the existing system input set which uses scanned images. Noise reduction technique such as low intensity pixel removal is applied to reduce the noise from the input image for improving the efficiency.

IGTM08 - Real-Time Vehicle Make and Model Recognition System

ABSTRACT - A Vehicle Make and Model Recognition (VMMR) system can provide great value in terms of vehicle monitoring and identification based on vehicle appearance in addition to the vehicles' attached license plate typical recognition. A real-time VMMR system is an important component of many applications such as automatic vehicle surveillance, traffic management, driver assistance systems, traffic behavior analysis, and traffic monitoring, etc. A VMMR system has a unique set of challenges and issues. Few of the challenges are image acquisition, variations in illuminations and weather, occlusions, shadows, reflections, large variety of vehicles, inter-class and intra-class similarities, addition/deletion of vehicles' models over time, etc. In this work, we present a unique and robust real-time VMMR system which can handle the challenges described above and recognize vehicles with high accuracy. We extract image features from vehicle images and create feature vectors to represent the dataset. We use two classification algorithms, Random Forest (RF) and Support Vector Machine (SVM), in our work. We use a realistic dataset to test and evaluate the proposed VMMR system. The vehicles' images in the dataset reflect real-world situations. The proposed VMMR system recognizes vehicles on the basis of make, model, and generation (manufacturing years) while the existing VMMR systems can only identify the make and model. Comparison with existing VMMR research

demonstrates superior performance of the proposed system in terms of recognition accuracy and processing speed

IGTM09 - Voice Based Gender Classification using Machine Learning Algorithm

ABSTRACT - Gender identification is one of the major problem speech analysis today. Tracing the gender from acoustic data i.e., pitch, median, frequency etc. Machine learning gives promising results for classification problem in all the research domains. There are several performance metrics to evaluate algorithms of an area. Our Comparative model algorithm for evaluating 5 different machine learning algorithms based on eight different metrics in gender classification from acoustic data. Agenda is to identify gender, with five different algorithms: Linear Discriminant Analysis (LDA), K-Nearest Neighbour (KNN), Classification and Regression Trees (CART), Random Forest (RF), and Support Vector Machine (SVM) on basis of eight different metrics. The main parameter in evaluating any algorithms is its performance. Misclassification rate must be less in classification problems, which says that the accuracy rate must be high. Location and gender of the person have become very crucial in economic markets in the form of AdSense. Here with this comparative model algorithm, we are trying to assess the different ML algorithms and find the best fit for gender classification of acoustic data.

IGTM10 - Plant disease diagnosis using CNN

ABSTRACT - Deep learning with convolutional neural networks (CNNs) has achieved great success in the classification of various plant diseases. However, a limited number of studies have elucidated the process of inference, leaving it as an untouchable *black box*. Revealing the CNN to extract the learned feature as an interpretable form not only ensures its reliability but also enables the validation of the model authenticity and the training dataset by human intervention. In this study, a variety of neuron-wise and layer-wise

visualization methods were applied using a CNN, trained with a publicly available plant disease image dataset. We showed that neural networks can capture the colors and textures of lesions specific to respective diseases upon diagnosis, which resembles human decision-making. While several visualization methods were used as they are, others had to be optimized to target a specific layer that fully captures the features to generate consequential outputs. Moreover, by interpreting the generated attention maps, we identified several layers that were not contributing to inference and removed such layers inside the network, decreasing the number of parameters by 75% without affecting the classification accuracy. The results provide an impetus for the CNN *black box* users in the field of plant science to better understand the diagnosis process and lead to further efficient use of deep learning for plant disease diagnosis.

IGTM11 - Analysis of Chronic Kidney Disease Dataset by Applying Machine Learning Methods

ABSTRACT - Currently, there are many people in the world suffering from chronic kidney diseases worldwide. Due to the several risk factors like food, environment and living standards many people get diseases suddenly without understanding of their condition. Diagnosing of chronic kidney diseases is generally invasive, costly, time-consuming and often risky. That is why many patients reach late stages of it without treatment, especially in those countries where the resources are limited. Therefore, the early detection strategy of the disease remains important, particularly in developing countries, where the diseases are generally diagnosed in late stages. Finding a solution for above-mentioned problems and riding out from disadvantages became a strong motive to conduct this study. In this research study, the effects of using clinical features

IGTM12 - AI-powered banana diseases and pest detection

ABSTRACT - Banana (*Musa* spp.) is the most popular marketable fruit crop grown all over the world, and a dominant staple food in many developing countries. Worldwide, banana

production is affected by numerous diseases and pests. Novel and rapid methods for the timely detection of pests and diseases will allow to surveil and develop control measures with greater efficiency. As deep convolutional neural networks (DCNN) and transfer learning has been successfully applied in various fields, it has freshly moved in the domain of just-in-time crop disease detection. The aim of this research is to develop an AI-based banana disease and pest detection system using a DCNN to support banana farmers.

IGTM13 - Hand Gesture Recognition with Convolution Neural Networks

ABSTRACT - Hand gestures are the most common forms of communication and have great importance in our world. They can help in building safe and comfortable user interfaces for a multitude of applications. Various computer vision algorithms have employed color and depth camera for hand gesture recognition, but robust classification of gestures from different subjects is still challenging. I propose an algorithm for real-time hand gesture recognition using convolutional neural networks (CNNs). The proposed CNN achieves an average accuracy of 98.76% on the dataset comprising of 9 hand gestures and 500 images for each gesture

IGTM14 - Rice Blast Disease Recognition Using a Deep Convolutional Neural Network

ABSTRACT - Rice disease recognition is crucial in automated rice disease diagnosis systems. At present, deep convolutional neural network (CNN) is generally considered the state-of-the-art solution in image recognition. In this paper, we propose a novel rice blast recognition method based on CNN. A dataset of 2906 positive samples and 2902 negative samples is established for training and testing the CNN model. In addition, we conduct comparative experiments for qualitative and quantitatively analysis in our evaluation of the effectiveness of the proposed method. The evaluation results show that the high-level features extracted by CNN are more discriminative and effective than traditional hand-

crafted features including local binary patterns histograms (LBPH) and Haar-WT (Wavelet Transform). Moreover, quantitative evaluation results indicate that CNN with Softmax and CNN with support vector machine (SVM) have similar performances, with higher accuracy, larger area under curve (AUC), and better receiver operating characteristic (ROC) curves than both LBPH plus an SVM as the classifier and Haar-WT plus an SVM as the classifier. Therefore, our CNN model is a top performing method for rice blast disease recognition and can be potentially employed in practical applications.

IGTM15 - A Novel Method for Improving Air Pollution Prediction Based on Machine Learning Approaches

ABSTRACT - Environmental pollution has mainly been attributed to urbanization and industrial developments across the globe. Air pollution has been marked as one of the major problems of metropolitan areas around the world, especially in Tehran, the capital of Iran, where its administrators and residents have long been struggling with air pollution damage such as the health issues of its citizens. As far as the study area of this research is concerned, a considerable proportion of Tehran air pollution is attributed to PM10 and PM2.5 pollutants. Therefore, the present study was conducted to determine the prediction models to determine air pollutions based on PM10 and PM2.5 pollution concentrations in Tehran. To predict the air-pollution, the data related to day of week, month of year, topography, meteorology, and pollutant rate of two nearest neighbors as the input parameters and machine learning methods were used. These methods include a regression support vector machine, geographically weighted regression, artificial neural network and auto-regressive nonlinear neural network with an external input as the machine learning method for the air pollution prediction. A prediction model was then proposed to improve the afore-mentioned methods, by which the error percentage has been reduced and improved by 57%, 47%, 47% and 94%, respectively. The most reliable algorithm for the prediction of air pollution was autoregressive nonlinear neural network with external input using the proposed prediction model, where its one-day prediction

error reached 1.79 µg/m3 . Finally, using genetic algorithm, data for day of week, month of year, topography, wind direction, maximum temperature and pollutant rate of the two nearest neighbors were identified as the most effective parameters in the prediction of air pollution.

IGTM16 - Smart Real-Time Video Surveillance Platform for Drowsiness Detection Based on Eyelid Closure

ABSTRACT - We propose drowsiness detection in real-time surveillance videos by determining if a person's eyes are open or closed. As a first step, the face of the subject is detected in the image. In the detected face, the eyes are localized and filtered with an extended Sobel operator to detect the curvature of the eyelids. Once the curves are detected, concavity is used to tell whether the eyelids are closed or open. Consequently, a concave upward curve means the eyelid is closed whereas a concave downwards curve means the eye is open. The proposed method is also implemented on hardware in order to be used in real-time scenarios, such as driver drowsiness detection. The evaluation of the proposed method used three image datasets, where images in the first dataset have a uniform background. The proposed method achieved classification accuracy of up to 95% on this dataset. Another benchmark dataset used has significant variations based on face deformations. With this dataset, our method achieved classification accuracy of 70%. A real-time video dataset of people driving the car was also used, where the proposed method achieved 95% accuracy, thus showing its feasibility for use in real-time scenarios.

IGTM17 - Deep Anomaly Detection for Generalized Face Anti-Spoofing

ABSTRACT - Face recognition has achieved unprecedented results, surpassing human capabilities in certain scenarios. However, these automatic solutions are not ready for production because they can be easily fooled by simple identity impersonation attacks. And although much effort has been devoted to develop face anti-spoofing models, their

generalization capacity still remains a challenge in real scenarios. In this paper, we introduce a novel approach that reformulates the Generalized Presentation Attack Detection (GPAD) problem from an anomaly detection perspective. Technically, a deep metric learning model is proposed, where a triplet focal loss is used as a regularization for a novel loss coined "metric-softmax", which is in charge of guiding the learning process towards more discriminative feature representations in an embedding space. Finally, we demonstrate the benefits of our deep anomaly detection architecture, by introducing a few-shot a posteriori probability estimation that does not need any classifier to be trained on the learned features. We conduct extensive experiments using the GRAD-GPAD framework that provides the largest aggregated dataset for face GPAD. Results confirm that our approach is able to outperform all the state-of-the-art methods by a considerable margin.

IGTM18 - Vision-based fall detection system for improving safety of elderly people

ABSTRACT - Recognition of human movements is very useful for several applications, such as smart rooms, interactive virtual reality systems, human detection and environment modeling. The objective of this work focuses on the detection and classification of falls based on variations in human silhouette shape, a key challenge in computer vision. Falls are a major health concern, specifically for the elderly. In this study, the detection is achieved with a multivariate exponentially weighted moving average (MEWMA) monitoring scheme, which is effective in detecting falls because it is sensitive to small changes. Unfortunately, an MEWMA statistic fails to differentiate real falls from some fall-like gestures. To remedy this limitation, a classification stage based on a support vector machine (SVM) is applied on detected sequences. To validate this methodology, two fall detection datasets have been tested: the University of Rzeszow fall detection dataset (URFD) and the fall detection dataset (FDD). The results of the MEWMA-based SVM are compared with three other classifiers: neural network (NN), naïve Bayes and K-nearest

neighbor (KNN). These results show the capability of the developed strategy to distinguish fall events, suggesting that it can raise an early alert in the fall incidents.

IGTM19 - A CNN-Based Framework for Comparison of Contactless to Contact-Based Fingerprints

ABSTRACT - Accurate comparison of contactless 2-D fingerprint images with contact-based fingerprints is critical for the success of emerging contactless 2-D fingerprint technologies, which offer more hygienic and deformation-free acquisition of fingerprint features. Convolutional neural networks (CNNs) have shown remarkable capabilities in biometrics recognition. However, there has been almost nil attempt to match fingerprint images using CNN-based approaches. This paper develops a CNN-based framework to accurately match contactless and contact-based fingerprint images. Our framework first trains a multi-Siamese CNN using fingerprint minutiae, respective ridge map and specific region of ridge map. This network is used to generate deep fingerprint representation using a distance-aware loss function. Deep fingerprint representations generated in such multi-Siamese network are concatenated for more accurate cross comparison. The proposed approach for cross-fingerprint comparison is evaluated on two publicly available databases containing contactless 2-D fingerprints and respective contact-based fingerprints. Our experiments presented in this paper consistently achieve outperforming results over several popular deep learning architectures and over contactless to contact-based fingerprints comparison methods in the literature

IGTM20 - Building an Intrusion Detection System Using a Filter-Based Feature Selection Algorithm

ABSTRACT-Redundant and irrelevant features in data have caused a long-term problem in network traffic classification. These features not only slow down the process of classification but also prevent a classifier from making accurate decisions, especially when coping with big data. In this paper, we propose a mutual information based algorithm

that analytically selects the optimal feature for classification. This mutual information based feature selection algorithm can handle linearly and nonlinearly dependent data features. Its effectiveness is evaluated in the cases of network intrusion detection.

IGTM21 - A Novel Recommendation Model Regularized with User Trust and Item Ratings

ABSTRACT -We propose TrustSVD, a trust-based matrix factorization technique for recommendations. TrustSVD integrates multiple information sources into the recommendation model in order to reduce the data sparsity and cold start problems and their degradation of recommendation performance. An analysis of social trust data from four real-world data sets suggests that not only the explicit but also the implicit influence of both ratings and trust should be taken into consideration in a recommendation model.

IGTM22 - DeepIris: Iris Recognition Using a Deep Learning Approach

ABSTRACT - Iris recognition has been an active research area during last few decades, because of its wide applications in security, from airports to homeland security border control. Different features and algorithms have been proposed for iris recognition in the past. In this paper, we propose an end-to-end deep learning framework for iris recognition based on residual convolutional neural network (CNN), which can jointly learn the feature representation and perform recognition. We train our model on a well-known iris recognition dataset using only a few training images from each class, and show promising results and improvements over previous approaches. We also present a visualization technique which is able to detect the important areas in iris images which can mostly impact the recognition results. We believe this framework can be widely used for other biometrics recognition tasks, helping to have a more scalable and accurate systems.

IGTM23 - Deep Convolutional Neural Networks for Lung Cancer Detection

ABSTRACT - Here we demonstrate a CAD system for lung cancer classification of CT scans with unmarked nodules, a dataset from the Kaggle Data Science Bowl 2017. Thresholding was used as an initial segmentation approach to to segment out lung tissue from the rest of the CT scan. Thresholding produced the next best lung segmentation. The initial approach was to directly feed in the segmented CT scans into 3D CNNs for classification, but this proved to be in- adequate. Instead, a modified U-Net trained on LUNA16 data (CT scans with labelled nodules) was used to first de-tect nodule candidates in the Kaggle CT scans. The U-Net nodule detection produced many false positives, so regions of CTs with segmented lungs where the most likely nodule candidates were located as determined by the U-Net out-put were fed into 3D Convolutional Neural Networks (a vanilla 3D CNN and a Googlenet-based 3D CNN) to ultimately classify the CT scan as positive or negative for lung cancer. The vanilla 3D CNN produced a test set AUC of??? and the Google net-based 3D CNN produced a test set AUC of ???. While performance of our CAD system is not state-of-the-art, current CAD systems in literature have several training and testing phases that each requires a lot of labelled data, while our CAD system has only three major phases (segmentation, nodule candidate detection, and malignancy classification), allowing more efficient training and detection and more generalizability to other cancers.

IGTM24 - Hotel Recommendation System Based on Hybrid Recommendation Model

ABSTRACT - we presented Machine Learning, Sentiment Word Net based method for opinion mining from hotel reviews, and sentence relevance score based method for opinion summarization of hotel reviews. The classified and summarized hotel review information helps web users to understand review contents easily in a short time. Opinion Mining for Hotel Review system that detects hidden sentiments in feedback of the

customer and rates the feedback accordingly. The system uses opinion-mining methodology in order to achieve desired functionality. Opinion mining for hotel reviews is a web application, which gives review of the feedback that is posted by various users. The system takes review of various users, based on the opinion, system will specify whether the posted hotel is good, bad, or worst. Based on users search on hotels, recommendations will be shown to the user based on how many times a user visited that particular hotel page. We use a database of sentiment based keywords along with positivity or negativity weight in database and then based on these sentiment keywords mined in user review is ranked. Once the user login to the system he views the hotels and gives review about the hotel. System will use database and will match the review with the keywords in database and rank the review accordingly. System will rate the hotel based on the rank of review. The role of the admin is to post new hotel and add keywords in database. This application is useful for those who are exploring new places and also useful for those who travel often. Using this application, a user will get to know which hotel is best and suitable for them. User can decide which hotel to accommodate before they reach the place.

IGTM25 - Music Genre Classification using Machine Learning Techniques

ABSTRACT - Categorizing music files according to their genre is a challenging task in the area of music information retrieval (MIR). In this study, we compare the performance of two classes of models. The first is a deep learning approach wherein a CNN model is trained end-to-end, to predict the genre label of an audio signal, solely using its spectrogram. The second approach utilizes hand-crafted features, both from the time domain and the frequency domain. We train four traditional machine learning classifiers with these features and compare their performance. The features that contribute the most towards this multi-class classification task are identified. The experiments are conducted

on the Audio set data set and we report an AUC value of 0.894 for an ensemble classifier which combines the two proposed approaches.

IGTM26 - Comprehensive Study on Social Network Mental Disorders Detection via Online Social Media Mining

ABSTRACT - The explosive growth in popularity of social networking leads to the problematic usage. An increasing number of social network mental disorders (SNMDs), such as Cyber-Relationship Addiction, Information Overload, and Net Compulsion, have been recently noted. Symptoms of these mental disorders are usually observed passively today, resulting in delayed clinical intervention. In this paper, we argue that mining online social behavior provides an opportunity to actively identify SNMDs at an early stage. It is challenging to detect SNMDs because the mental status cannot be directly observed from online social activity logs. Our approach, new and innovative to the practice of SNMD detection, does not rely on self-revealing of those mental factors via questionnaires in Psychology. Instead, we propose a machine learning framework, namely, Social Network Mental Disorder Detection (SNMDD), that exploits features extracted from social network data to accurately identify potential cases of SNMDs. We also exploit multi-source learning in SNMDD and propose a new SNMD-based Tensor Model (STM) to improve the accuracy. To increase the scalability of STM, we further improve the efficiency with performance guarantee. Our framework is evaluated via a user study with 3126 online social network users. We conduct a feature analysis, and also apply SNMDD on large-scale datasets and analyze the characteristics of the three SNMD types. The results manifest that SNMDD is promising for identifying online social network users with potential SNMDs

IGTM27 - Kannada Handwritten Document Recognition using Convolutional Neural Network

ABSTRACT - In this paper, character recognition system for documents written in Kannada language is proposed. Paper provides the technical details of design and implementation of proposed. Convolutional Neural Network (CNN) model is used for the implementation and Chars74K dataset is used for training the model. System has achieved accuracy of 98% for the document containing non-overlapping lines of characters.

IGTM28 - Image-Based Estimation of Real Food Size for Accurate Food Calorie Estimation

ABSTRACT - In this paper, we review our works on image-based estimation of real size of foods for accurate food calorie estimation which including three existing works and two new works: (1) "CalorieCam" which is a system to estimate real food size based on a reference object, (2) Region segmentation based food calorie estimation, (3) "AR Deep CalorieCam V2" which is based on visual inertial odometry built in the iOS ARKit library, (4) "Depth CalorieCam" which employs stereo cameras on iPhone X/XS, and (5) "Rice CalorieCam" which exploits rice grains as reference objects. Especially, the last two new methods achieved 10% or less estimation error, which was enough for robust food calorie estimation

IGTM29 - Brain Tumor Detection and Segmentation

ABSTRACT - In recent years, Brain tumor detection and segmentation has created an interest on research areas. The process of identifying and segmenting brain tumor is a very tedious and time consuming task, since human physique has anatomical structure naturally. Magnetic Resonance Image (MRI) scan analysis is a powerful tool that makes effective detection of the abnormal tissues from the brain. Among different techniques, Magnetic Resonance Image (MRI) is a liable one which contains several modalities in scanning the images captured from interior structure of human brain. A novel hybrid energy-efficient method is proposed for automatic tumor detection and segmentation.

The proposed system follows K-means clustering, integrated with Fuzzy C-Means (KMFCM) and active contour by level set for tumor segmentation. An effective segmentation, edge detection and intensity enhancement can detect brain tumor easily. For that, active contour with level set method has been utilized. The performance of the proposed approach has been evaluated in terms of white pixels, black pixels, tumor detected area, and the processing time. This technique can deal with a higher number of segmentation problem and minimum execution time by ensuring segmentation quality. Additionally, tumor area length in vertical and horizontal positions is determined to measure sensitivity, specificity, accuracy, and similarity index values. Further, tumor volume is computed. Knowledge of the information of tumor is helpful for the physicians for effective diagnosing in tumor for treatments.

IGTM30 - Vision-Based Traffic Sign Detection and Recognition Systems

ABSTRACT - The automatic traffic sign detection and recognition (TSDR) system is very important research in the development of advanced driver assistance systems (ADAS). Investigations on vision-based TSDR have received substantial interest in the research community, which is mainly motivated by three factors, which are detection, tracking and classification. During the last decade, a substantial number of techniques have been reported for TSDR. This paper provides a comprehensive survey on traffic sign detection, tracking and classification. The details of algorithms, methods and their specifications on detection, tracking and classification are investigated and summarized in the tables along with the corresponding key references. A comparative study on each section has been provided to evaluate the TSDR data, performance metrics and their availability. Current issues and challenges of the existing technologies are illustrated with brief suggestions and a discussion on the progress of driver assistance system research in the future. This review will hopefully lead to increasing efforts towards the development of future vision-based TSDR system.

IGTM31 - Automatic Motorcyclist Helmet Rule Violation Detection using Tensorflow & Keras in OpenCV.

ABSTRACT - Motorcycle accidents have been hastily growing throughout the years in several countries because road safety is often neglected by riders worldwide leading to accidents and deaths. To address this issue, most countries have laws which mandate the use of helmets for two-wheeler riders so, it is very important for motorcyclists to understand the risks of riding without a helmet. Riders who do not wear helmets are at greatest risk of suffering a traumatic brain injury; if they met with an accident without protection, the head is susceptible to a harrowing impact in an accident. In India, there is a rule that mandate helmet only for riders but not even for passengers. Anyone may suffer from accident or head injuries whom are using motorcycle without helmet. It should be mandatory for everyone to wear helmet; even for children. So, to mandate this we have developed a system which is based on Tensorflow & Keras in the field of Computer Vision. System is able to detect whether motorcyclists wear helmet or not even at real time. If anyone of them is present with no helmet then system will precisely observed the situation and declare the rule violations. The system can be implemented in malls, offices, marts, school and college that only allows people to enter the premises only after detecting helmet with automated barrier. It will definitely affect the use of helmet that will save humans life at all.

IGTM32 - Deep Learning for Depression Detection of Twitter Users

ABSTRACT - Mental illness detection in social media can be considered a complex task, mainly due to the complicated nature of mental disorders. In recent years, this research area has started to evolve with the continuous increase in popularity of social media platforms that became an integral part of people's life. This close relationship between social media platforms and their users has made these platforms to reflect the users' personal life on many levels. In such an environment, researchers are presented with a

wealth of information regarding one's life. In addition to the level of complexity in identifying mental illnesses through social media platforms, adopting supervised machine learning approaches such as deep neural networks have not been widely accepted due to the difficulties in obtaining sufficient amounts of annotated training data. Due to these reasons, we try to identify the most effective deep neural network architecture among a few of selected architectures that were successfully used in natural language processing tasks. The chosen architectures are used to detect users with signs of mental illnesses (depression in our case) given limited unstructured text data extracted from the Twitter social media platform.

IGTM33 - Crowd Analysis with Facial Expression Analysis

ABSTRACT - Facial expression recognition has been a challenge for many years. With the recent growth in machine learning, a real-time facial expression recognition system using deep learning technology can be useful for an emotion monitoring system for Human-computer interaction(HCI). We proposed a Personal Facial Expression Monitoring System (PFEMS).We designed a custom Convolutional Neural Network model and used it to train and test different facial expression images with the TensorFlow machine learning library. PFEMS has two parts, a recognizer for validation and a data training model for data training. The recognizer contains a facial detector and a facial expression recognizer. The facial detector extracts facial images from video frames and the facial expression recognizer distinguishes the extracted images. The data training model uses the Convolutional Neural Network to train data and the recognizer also uses Convolutional Neural Network to monitor the emotional state of a user through their facial expressions. The system recognizes the six universal emotions, angry, disgust, happy, surprise, sad and fear, along with neutral.

IGTM34 - Detection of skin disease by using image processing

ABSTRACT -In recent days, skin disease is seen as one of the most dangerous form of disease found in Humans. The detection of skin disease in early stage can be helpful to cure it. Computer vision can play important role in Medical Image Diagnosis and it has been proved by many existing systems. In this work, we present a computer aided method for the detection of Skin disease using Image Processing tools. The input to the system is the skin lesion image and then by applying novel image processing techniques, it analyses it to conclude about the presence of type of skin disease. To achieve this goal, feature extraction is considered as an essential-weapon to analyse an image appropriately. In this work, different digital images have been analysed based on unsupervised segmentation techniques. Feature extraction techniques are then applied on these segmented images. After this, a comprehensive discussion has been explored based on the obtained results.

IGTM35 - Phishing Web Sites Features Classification Based on Extreme Learning Machine.

ABSTRACT -Phishing are one of the most common and most dangerous attacks among cybercrimes. The aim of these attacks is to steal the information used by individuals and organizations to conduct transactions. Phishing websites contain various hints among their contents and web browser-based information. The purpose of this study is to perform Extreme Learning Machine (ELM) based classification for 30 features including Phishing Websites Data in UC Irvine Machine Learning Repository database. For results assessment, ELM was compared with other machine learning methods such as Support Vector Machine (SVM), Naïve Bayes (NB) and detected to have the highest accuracy of 95.34%

IGTM36 - Abnormal Event Detection in Video Surveillance Scenes (Crime Activity Detection using Videos)

ABSTRACT - At present, the existing abnormal event detection models based on deep learning mainly focus on data represented by a vectorial form, which pay little attention to the impact of the internal structure characteristics of feature vector. In addition, a single classifier is difficult to ensure the accuracy of classification. In order to address the above issues, we propose an abnormal event detection hybrid modulation method via feature expectation subgraph calibrating classification in video surveillance scenes in this paper. Our main contribution is to calibrate the classification of a single classier by constructing feature expectation subgraphs. First, we employ convolutional neural network and long short-term memory models to extract the spatiotemporal features of video frame, and then construct the feature expectation subgraph for each key frame of every video, which could be used to capture the internal sequential and topological relational characteristics of structured feature vector. Second, we project expectation subgraphs on the sparse vector to combine with a support vector classier to calibrate the results of a linear support vector classier. Finally, the experiments on a common dataset named UCSDped1 and a coal mining video dataset in comparison with some existing works demonstrate that the performance of the proposed method is better than several the state-of-the-art approaches.

IGTM37 - AI Vision Based Social Distancing Detection.

ABSTRACT -The rampant coronavirus disease 2019 (COVID-19) has brought global crisis with its deadly spread to more than 180 countries, and about 3,519,901 confirmed cases along with 247,630 deaths globally as on May 4, 2020. The absence of any active therapeutic agents and the lack of immunity against COVID19 increases the vulnerability of the population. Since there are no vaccines available, social distancing is the only feasible approach to fight against this pandemic. Motivated by this notion, this article

proposes a deep learning based framework for automating the task of monitoring social distancing using surveillance video. The proposed framework utilizes the YOLO object detection model to segregate humans from the background and to track the identified people with the help of bounding boxes The violation index term is proposed to quantize the non-adoption of social distancing protocol. From the experimental analysis, it is observed that the YOLO with Deepsort tracking scheme displayed best results with balanced criteria to monitor the social distancing in real-time.

IGTM38 - Machine learning and data science for a household-specific poverty level prediction task

ABSTRACT -This project focuses on a prediction task from the Kaggle data science challenge site: prediction of the poverty level of individual households using supervised classification learning. In Latin America, the Proxy Means Test (PMT) is the most popular method used to verify the income qualification. The PMT works by considering the observable properties of a household, such as the walls, ceilings, and electric devices in a family home. These and other general assets are used to classify the poverty level, assigning one of the four labels: (1) extreme poverty, (2) moderate poverty, (3) vulnerable households and (4) non-vulnerable households. The accuracy of learned classification models submitted as solutions to this data challenge has tended to decrease as a function of dataset size. Therefore, in this project, I am focusing on methods for boosting accuracy in detecting poverty level using committee machines (bagging, boosting, etc.) for supervised inductive learning. Because the task is classification learning, my first approach is to apply random forests (a decision tree ensemble method); depending on the accuracy, I will proceed with the advanced methods, such as light gradient-boosting methods (GBMs) and neural networks that are frequently used on large, complex multivariate classification tasks. The inference task is to predict the poverty level of a new household using attributes of the family home and other attributes found to be relevant by the learning algorithm. This enables use of cases of artificial intelligence for social good, such

as helping governments and relief and economic development agencies to identify communities in need.

IGTM39 - BIRD SPECIES IDENTIFICATION USING DEEP LEARNING

ABSTRACT -Now a day some bird species are being found rarely and if found classification of bird species prediction is difficult. Naturally, birds present in various scenarios appear in different sizes, shapes, colors, and angles from human perspective. Besides, the images present strong variations to identify the bird species more than audio classification. Also, human ability to recognize the birds through the images is more understandable. So this method uses the Caltech-UCSD Birds 200 [CUB-200-2011] dataset for training as well as testing purpose. By using deep convolutional neural network (DCNN) algorithm an image converted into grey scale format to generate autograph by using tensor flow, where the multiple nodes of comparison are generated. These different nodes are compared with the testing dataset and score sheet is obtained from it. After analyzing the score sheet it can predicate the required bird species by using highest score. Experimental analysis on dataset (i.e. Caltech-UCSD Birds 200 [CUB-200-2011]) shows that algorithm achieves an accuracy of bird identification between 80% and 90%

IGTM40 - Fake Indian Currency Recognition

ABSTRACT -Indian is a developing country, Production, and printing of Fake notes of Rs.100, 500 and 1000 were already there but after the demonetization, the counterfeit notes of new Rs.50,200,500,2000 have also come to the light in very short time and which effects the country's economic growth. From last few years due to technological advancement in color printing, duplicating, and scanning, counterfeiting problems are coming into the picture. In this article, recognition and verification of paper currency with the help of digital image processing techniques is described. The characteristics extraction is performed on the image of the currency and it is compared with the characteristics of

the genuine currency. The currency will be recognized and verified by using image processing techniques. The approach consists of a number of components including image processing, edge detection, image segmentation and characteristic extraction and comparing images. The desired results will be the text and voice output of the currency recognized and verified.

IGTM41 - ACCIDENT SEVERITY DETECTION AND PREDICTION USING MACHINE LEARNING TECHNIQUES

ABSTRACT -Despite all that has been done to promote Road Safety in India so far, there are always regions that fall prey to the vulnerabilities that linger on in every corner. The heterogeneity of these vulnerability-inducing causes leads to the need for an effective analysis so as to subdue the alarming figures by a significant amount. The traffic has been transformed into the difficult structure in points of designing and managing by the reason of increasing number of vehicles. This situation has discovered road accidents problem, influenced public health and country economy and done the studies on solution of the problem. Large calibrated data agglomerations have increased by the reasons of the technological improvements and data storage with low cost. Arising the need of accession to information from this large calibrated data obtained the corner stone of the data mining. This work analyzes the road accidents in India data using the most compatible machine learning classification techniques for road accidents estimation by data mining has been intended.

IGTM42 - Data Mining and Machine Learning Techniques for Cyber Security Intrusion Detection

ABSTRACT - A threat can be anything that causes potential damage to the network system. These threats can turn out to be a attack to the system. Threat may occur in any forms like viruses, outright attack, and phishing attack from hackers to gain information. Such attacks put a user's system and also business system at risks. Cyber security aims at

the protection of system from attacks like unauthorized network access, intrusions attacks etc. This paper presents a novel architecture model based on machine learning for the prediction of Cyber security malware that requires execution in a sandbox environment. In order to prevent the attackers from infiltrating the system Machine Learning approach is adapted.

IGTM43 - Facial Mask Detection using Semantic Segmentation

ABSTRACT -Face Detection has evolved as a very popular problem in Image processing and Computer Vision. Many new algorithms are being devised using convolutional architectures to make the algorithm as accurate as possible. These convolutional architectures have made it possible to extract even the pixel details. We aim to design a binary face classifier which can detect any face present in the frame irrespective of its alignment. We present a method to generate accurate face segmentation masks from any arbitrary size input image. Beginning from the RGB image of any size, the method uses Predefined Training Weights of VGG – 16 Architecture for feature extraction. Training is performed through Fully Convolutional Networks to semantically segment out the faces present in that image. Gradient Descent is used for training while Binomial Cross Entropy is used as a loss function. Further the output image from the FCN is processed to remove the unwanted noise and avoid the false predictions if any and make bounding box around the faces. Furthermore, proposed model has also shown great results in recognizing non-frontal faces. Along with this it is also able to detect multiple facial masks in a single frame. Experiments were performed on Multi Parsing Human Dataset obtaining mean pixel level accuracy of 93.884 % for the segmented face masks.

IGTM44 - Vehicle classification and speed estimation using Computer Vision techniques

ABSTRACT -In this work, we implement a real-time vehicle classification and speed estimation system and apply it to videos acquired from traffic cameras installed in highways. In this approach we: a) Detect moving vehicles through background-foreground segmentation techniques. b) Compare different supervised classifiers (e.g. artificial neural networks) for vehicle classification into categories: (car, motorcycle, van, and bus/truck). c) Apply a calibration method to geo reference vehicles using satellite images. d) Estimate vehicles speed per class using feature tracking and nearest neighbor's algorithms

IGTM45 - Human Activity Recognition using OpenCV & Python

ABSTRACT -Human activities recognition has become a groundwork area of great interest because it has many significant and futuristic applications; including automated surveillance, Automated Vehicles, language interpretation and human computer interfaces (HCI). In recent time an exhaustive and in depth research has been done and progress has been made in this area. The idea of the proposed system is a system which can be used for surveillance and monitoring applications. This paper presents a part of newer Human activity/interaction recognition onto human skeletal poses for video surveillance using one stationary camera for the recorded video data set. The traditional surveillance cameras system requires humans to monitor the surveillance cameras for 24*7 which is oddly inefficient and expensive. Therefore, this research paper will provide the mandatory motivation for recognizing human action effectively in real-time (future work). This paper focuses on recognition of simple activity like walk, run, sit, stand by using image processing techniques.

IGTM46 - SMS Spam Detection using Machine Learning Approach.

ABSTRACT -Over recent years, as the popularity of mobile phone devices has increased, Short Message Service (SMS) has grown into a multi-billion dollars industry. At the same time, reduction in the cost of messaging services has resulted in growth in unsolicited commercial advertisements (spams) being sent to mobile phones. In parts of Asia, up to 30% of text messages were spam in 2012. Lack of real databases for SMS spams, short length of messages and limited features, and their informal language are the factors that may cause the established email filtering algorithms to underperform in their classification. In this project, a database of real SMS Spams from UCI Machine Learning repository is used, and after preprocessing and feature extraction, different machine learning techniques are applied to the database. Finally, the results are compared and the best algorithm for spam filtering for text messaging is introduced. Final simulation results using 10-fold cross validation shows the best classifier in this work reduces the overall error rate of best model in original paper citing this dataset by more than half.

IGTM47 - Text Detection and Recognition Using Enhanced MSER Detection and a Novel OCR Technique

ABSTRACT -Detection and recognition of text from any natural scene image is challenging but essential extensively for extracting information from the image. In this paper, we propose an accurate and effective algorithm for detecting enhanced Maximally Stable Extremal Regions (MSERs) as main character candidates and these character candidates are filtered by stroke width variation for removing regions where the stroke width exhibits too much variation. For the detection of text regions, firstly some preprocessing is applied to the natural image and then after detecting MSERs, an intersection of canny edge and MSER region is produced to locate regions that are even more likely to belong to text. Finally, the selected text region is taken as an input of a novel Optical Character Recognition (OCR) technique to make the text editable and

usable. The evaluation results substantiates 77.47% of the f-measure on the ICDAR 2011 dataset which is better than the previous performance 76.22%.

IGTM48 - A Hybrid Feature Extraction Method with Regularized Extreme Learning Machine for Brain Tumor Classification

ABSTRACT -Brain cancer classification is an important step that depends on the physician's knowledge and experience. An automated tumor classification system is very essential to support radiologists and physicians to identify brain tumors. However, the accuracy of current systems need to be improved for suitable treatments. In this paper, we propose a hybrid feature extraction method with regularized extreme learning machine for developing an accurate brain tumor classification approach. The approach starts by extracting the features from brain images using the hybrid feature extraction method; then, computing the covariance matrix of these features to project them into a new significant set of features using principle component analysis (PCA). Finally, a regularized extreme learning machine (RELM) is used for classifying the type of brain tumor. To evaluate and compare the proposed approach, a set of experiments is conducted on a new public dataset of brain images. Experimental results proved that the approach is more effective compared to the existing state-of-the-art approaches, and the performance in terms of classification accuracy improved from 91.51% to 94.233% for the experiment of random holdout technique.

IGTM49 - Computer-Aided Segmentation of Liver Lesions in CT Scans Using Cascade Convolutional Neural Networks and Genetically Optimised Classifier.

ABSTRACT -Abdominal CT scans have been widely studied and researched by medical professionals in recent years. CT scans have proved effective for the task of detection of liver abnormalities in patients. Computer-aided automatic segmentation of the liver can serve as an elementary step for radiologists to trace anomalies in the liver. In this paper, we have explored deep learning techniques first and foremost for the extraction of liver

from the abdominal CT scan and then, consequently, to segment the lesions from a tumor-ridden liver. A cascaded model of convolutional neural networks is used to segment lesions once tumor has been detected in the liver by GA-ANN which has been fed textural liver features using LTEM for its classification procedure. A high DICE index has been obtained of 0.9557 for liver segmentation and 0.6976 for lesion segmentation.

IGTM50 - Voice based Email for Blind.

ABSTRACT -As the title suggests, the application will be a web-based application for visually impaired persons using IVR- Interactive voice response, thus enabling everyone to control their mail accounts using their voice only and to be able to read, send, and perform all the other useful tasks. The system will prompt the user with voice commands to perform certain action and the user will respond to the same. The main benefit of this system is that the use of keyboard is completely eliminated, the user will have to respond through voice and mouse click only. Now you must be thinking that how will a blind person will see the correct position on the screen for doing mouse clicks. But this system will perform actions based on the clicks only that is left click or right click, it does not depends on the portion of the screen where the cursor is placed before the click giving user the freedom to click blindly anywhere on the screen

IGTM51 - Driver Drowsiness Monitoring System using Visual Behaviour and Machine Learning

ABSTRACT -Drowsy driving is one of the major causes of road accidents and death. Hence, detection of driver's fatigue and its indication is an active research area. Most of the conventional methods are either vehicle based, or behavioral based or physiological based. Few methods are intrusive and distract the driver, some require expensive sensors and data handling. Therefore, in this study, a low cost, real time driver's drowsiness detection system is developed with acceptable accuracy. In the developed system, a

webcam records the video and driver's face is detected in each frame employing image processing techniques.

Facial landmarks on the detected face are pointed and subsequently the eye aspect ratio, mouth opening ratio and nose length ratio are computed and depending on their values, drowsiness is detected based on developed adaptive thresholding. Machine learning algorithms have been implemented as well in an offline manner. A sensitivity of 95.58% and specificity of 100% has been achieved in Support Vector Machine based classification.

IGTM52 - Deep Learning for the Detection of COVID-19 Using Transfer Learning and Model Integration

ABSTRACT - We researched the diagnostic capabilities of deep learning on chest radiographs and an image classifier based on the COVID-Net was presented to classify chest X-Ray images. In the case of a small amount of COVID-19 data, data enhancement was proposed to expanded COVID-19 data 17 times. Our model aims at transfer learning, model integration and classifies chest XRay images according to three labels: normal, COVID-19 and viral pneumonia. According to the accuracy and loss value, choose the models ResNet-101 and ResNet-152 with good effect for fusion, and dynamically improve their weight ratio during the training process. After training, the model can achieve 96.1% of the types of chest X-Ray images accuracy on the test set. This technology has higher sensitivity than radiologists in the screening and diagnosis of lung nodules. As an auxiliary diagnostic technology, it can help radiologists improve work efficiency and diagnostic accuracy.

IGTM53 - An Open-Ended Continual Learning for Food Recognition Using Class Incremental Extreme Learning Machines

ABSTRACT - State-of-the-art deep learning models for food recognition do not allow data incremental learning and often suffer from catastrophic interference problems during the class incremental learning. This is an important issue in food recognition since

real-world food datasets are open-ended and dynamic, involving a continuous increase in food samples and food classes. Model retraining is often carried out to cope with the dynamic nature of the data, but this demands high-end computational resources and significant time. This paper proposes a new open-ended continual learning framework by employing transfer learning on deep models for feature extraction, Relief F for feature selection, and a novel adaptive reduced class incremental kernel extreme learning machine (ARCIKELM) for class cation. Transfer learning is beneficial due to the high generalization ability of deep learning features. Relief F reduces computational complexity by ranking and selecting the extracted features. The novel ARCIKELM classifier dynamically adjusts network architecture to reduce catastrophic forgetting. It addresses domain adaptation problems when new samples of the existing class arrive. To conduct comprehensive experiments, we evaluated the model against four standard food benchmarks and a recently collected Pakistani food dataset. Experimental results show that the proposed framework learns new classes incrementally with less catastrophic inference and adapts domain changes while having competitive classi_cation performance.

IGTM54 - Exploring Deep Learning in Semantic Question Matching

ABSTRACT -Question duplication is the major problem encountered by Q&A forums like Quora, Stack-overflow, Reddit, etc. Answers get fragmented across different versions of the same question due to the redundancy of questions in these forums. Eventually, this results in lack of a sensible search, answer fatigue, segregation of information and the paucity of response to the questioners. The duplicate questions can be detected using Machine Learning and Natural Language Processing. Dataset of more than 400,000 questions pairs provided by Quora are pre-processed through tokenization, lemmatization and removal of stop words. This pre-processed dataset is used for the feature extraction. Artificial Neural Network is then designed and the features hence

extracted, are fit into the model. This neural network gives accuracy of 86.09%. In a nutshell, this research predicts the semantic coincidence between the question pairs extracting highly dominant features and hence, determine the probability of question being duplicate.

IGTM55 - Animal Classification using Facial Images with Score Level Fusion

ABSTRACT - A real-world animal biometric system that detects and describes animal life in image and video data is an emerging subject in machine vision. These systems develop computer vision approaches for the classification of animals. A novel method for animal face classification based on score-level fusion of recently popular convolutional neural network (CNN) features and appearance-based descriptor features is presented. This method utilizes a score-level fusion of two different approaches; one uses CNN which can automatically extract features, learn and classify them; and the other one uses kernel Fisher analysis (KFA) for its feature extraction phase. The proposed method may also be used in other areas of image classification and object recognition. The experimental results show that automatic feature extraction in CNN is better than other simple feature extraction techniques (both local- and appearance-based features), and additionally, appropriate score-level combination of CNN and simple features can achieve even higher accuracy than applying CNN alone. The authors showed that the score-level fusion of CNN extracted features and appearance-based KFA method have a positive effect on classification accuracy. The proposed method achieves 95.31% classification rate on animal faces which is significantly better than the other state-of-the-art methods.

IGTM56 - Artificial Intelligence and COVID-19: Deep Learning Approaches for Diagnosis and Treatment

ABSTRACT - COVID-19 outbreak has put the whole world in an unprecedented difficult situation bringing life around the world to a frightening halt and claiming thousands of

lives. Due to COVID-19's spread in 212 countries and territories and increasing numbers of infected cases and death tolls mounting to 5,212,172 and 334,915 (as of May 22 2020), it remains a real threat to the public health system. This paper renders a response to combat the virus through Artificial Intelligence (AI). Some Deep Learning (DL) methods have been illustrated to reach this goal, including Generative Adversarial Networks (GANs), Extreme Learning Machine (ELM), and Long /Short Term Memory (LSTM). It delineates an integrated bioinformatics approach in which different aspects of information from a continuum of structured and unstructured data sources are put together to form the user-friendly platforms for physicians and researchers. The main advantage of these AI-based platforms is to accelerate the process of diagnosis and treatment of the COVID-19 disease. The most recent related publications and medical reports were investigated with the purpose of choosing inputs and targets of the network that could facilitate reaching a reliable Artificial Neural Network-based tool for challenges associated with COVID-19. Furthermore, there are some specific inputs for each platform, including various forms of the data, such as clinical data and medical imaging which can improve the performance of the introduced approaches toward the best responses in practical applications.

IGTM57 - English Football Prediction Using Machine Learning Classifiers

ABSTRACT - Sports Analysis and Betting have been on the rise lately with the ever increasing ease of Internet accessibility and popularity of Machine Learning. This is an interesting area of research for football, as football is regarded as much more complex and dynamic when compared to a few other sports. It is also the world's most popular sport, played in over 200 countries. Several methodologies and approaches are being taken to develop prediction systems. In this paper, we predict the match outcomes of the English Premier League, by performing a detailed study of past football matches and observing the most important attributes that are likely to decide the conclusion. We use

algorithms such as Support Vector Machines, XGBoost and Logistic Regression and then select the best one to give us the target label. This model is applied on real team data and fixture results gathered from for the past few seasons.

IGTM58 - Machine Learning Techniques for Stress Prediction in Working Employees

ABSTRACT -Stress disorders are a common issue among working IT professionals in the industry today. With changing lifestyle and work cultures, there is an increase in the risk of stress among the employees. Though many industries and corporates provide mental health related schemes and try to ease the workplace atmosphere, the issue is far from control. In this paper, we would like to apply machine learning techniques to analyze stress patterns in working adults and to narrow down the factors that strongly determine the stress levels. Towards this, data from the OSMI mental health survey 2017 responses of working professionals within the tech-industry was considered. Various Machine Learning techniques were applied to train our model after due data cleaning and preprocessing. The accuracy of the above models was obtained and studied comparatively. Boosting had the highest accuracy among the models implemented. By using Decision Trees, prominent features that influence stress were identified as gender, family history and availability of health benefits in the workplace. With these results, industries can now narrow down their approach to reduce stress and create a much comfortable workplace for their employees.

IGTM59 - Machine Learning-Based Models for Early Stage Detection of Autism Spectrum Disorders

ABSTRACT -Autism Spectrum Disorder (ASD) is a group of neuro developmental disabilities that are not curable but may be ameliorated by early interventions. We gathered early-detected ASD datasets relating to toddlers, children, adolescents and adults, and applied several feature transformation methods, including log, Z-score and sine functions to these datasets. Various classification techniques were then implemented

with these transformed ASD datasets and assessed for their performance. We found SVM showed the best performance for the toddler dataset, while Adaboost gave the best results for the children dataset, Glmboost for the adolescent and Adaboost for the adult datasets. The feature transformations resulting in the best classifications was sine function for toddler and Z-score for children and adolescent datasets. After these analyses, several feature selection techniques were used with these Z-score-transformed datasets to identify the significant ASD risk factors for the toddler, child, adolescent and adult subjects. The results of these analytical approaches indicate that, when appropriately optimised, machine learning methods can provide good predictions of ASD status. This suggests that it may possible to apply these models for the detection of ASD in its early stages.

IGTM60 - Analysis of Women Safety in Indian Cities Using Machine Learning on Tweets

ABSTRACT - Women and girls have been experiencing a lot of violence and harassment in public places in various cities starting from stalking and leading to sexual harassment or sexual assault. This research paper basically focuses on the role of social media in promoting the safety of women in Indian cities with special reference to the role of social media websites and applications including Twitter platform Facebook and Instagram. This paper also focuses on how a sense of responsibility on part of Indian society can be developed the common Indian people so that we should focus on the safety of women surrounding them. Tweets on Twitter which usually contains images and text and also written messages and quotes which focus on the safety of women in Indian cities can be used to read a message amongst the Indian Youth Culture and educate people to take strict action and punish those who harass the women. Twitter and other Twitter handles which include hash tag messages that are widely spread across the whole globe sir as a platform for women to express their views about how they feel while we go out for work

or travel in a public transport and what is the state of their mind when they are surrounded by unknown men and whether these women feel safe or not?

IGTM61 - A Survey on Placement prediction system using machine learning

ABSTRACT -The ease of making better choices and making better decisions in terms of selecting colleges is the main aim of this system. Our analysis on colleges for the students makes easier for them to make accurate decision about their preferred colleges. For such analysis, it requires future possibilities from the past record data which can potentially make the predictions and recommendation for students. Our analysis with the machine learning classification methods would help giving probable accuracy and this requires analytical methods for predicting future recommendation. Today, most students make mistakes in their preference list due to lack of knowledge, improper and incorrect analysis of colleges and insecure predictions. Hence repent and regret after allotment. Our project will solve the general issue of the student community by using machine learning technology. In this system Random Forest and Decision Tree machine learning classification algorithm is going to use.

IGTM62 - Fake News Identification on Twitter with Hybrid CNN and RNN Models

ABSTRACT - The problem associated with the propagation of fake news continues to grow at an alarming scale. This trend has generated much interest from politics to academia and industry alike. We propose a framework that detects and classifies fake news messages from Twitter posts using hybrid of convolutional neural networks and long-short term recurrent neural network models. The proposed work using this deep learning approach achieves 82% accuracy. Our approach intuitively identifies relevant features associated with fake news stories without previous knowledge of the domain.

IGTM63 - Supervised Machine Learning Algorithms for Credit Card Fraudulent Transaction Detection: A Comparative Study

Abstract: The goal of data analytics is to delineate hidden patterns and use them to support informed decisions in a variety of situations. Credit card fraud is escalating significantly with the advancement of modernized technology and became an easy target for frauds. Credit card fraud has highly imbalanced publicly available datasets. In this paper, we apply many supervised machine learning algorithms to detect credit card fraudulent transactions using a real-world dataset. Furthermore, we employ these algorithms to implement a super classifier using ensemble learning methods. We identify the most important variables that may lead to higher accuracy in credit card fraudulent transaction detection. Additionally, we compare and discuss the performance of various supervised machine learning algorithms that exist in literature against the super classifier that we implemented in this paper.

IGTM64 - Prediction of Lung Cancer using Machine Learning Techniques

ABSTRACT -As there is a big growth in large volume of data now days, this will create a need for extracting meaningful data from the information. Machine Learning is contributing in various type of applications domains related to information technology, stock, marketing, healthcare and banking among them. With the increase in population growth has increased in coupled of disease and has increased the necessity of machine learning model in diagnosis using medical datasets. From the various biomedical datasets, cancer is the widest disease that has killed human life over 7 million every year and lung cancer among them is nearly 17% of moralities. Previous research works show that survival rate of patients affected with cancer is larger and higher, when compared to the diagnosed at the initial stage, Lung cancer is the most historic data and dependent disease in for early diagnosis. This has created the researcher to use machine learning technique for early diagnosis of lung cancer in stage 1.There has-been an increase in survival rate to

about 70% at the early stage of detection, when tumor is not spread. Pre-existing techniques the five-year survival rate increases to 70% with the early detection at stage 1, when the tumor has not yet spread. Existing medical techniques like X-Ray, Computed Tomography (CT) scan, sputum cytology analysis and other imaging techniques not only require complex equipment and high cost but is also proven to be efficient only in stage 4, when the tumor has metastasized to other parts of the body. Our proposed work involves the uses of machine learning technique used in classification of lung cancer patients and the categorization of stage to which it belongs positive. The work is based on early diagnosis of prediction of lung cancer which suggests the doctors in treating the patients for increasing the survival rate of the human.

IGTM65 - Agriculture Analysis Using Data Mining and Machine Learning Techniques

ABSTRACT - Agriculture is an important application in India. The modern technologies can change the situation of farmers and decision making in agricultural field in a better way. Python is used as a front end for analysing the agricultural data set. Jupiter Notebook is the data mining tool used to predict the crop production. The parameter includes in the dataset are precipitation, temperature, reference crop, evapotranspiration, area, production and yield for the season from January to December for the years 2000 to 2018. The data mining techniques like K-Means Clustering, KNN, SVM, and Bayesian network algorithm where high accuracy can be achieved.

IGTM66 – Image Deblurring and Super –Resolution Using CNN

ABSTRACT -Recently multiple high performance algorithms have been developed to infer high-resolution images from low-resolution image input using deep learning algorithms. The related problem of super-resolution from blurred or corrupted low resolution images has however received much less attention. In this work, we propose a new deep learning

approach that simultaneously addresses deblurring and super-resolution from blurred low resolution images. We evaluate the state of-the-art super-resolution convolutional neural network (SRCNN) architecture proposed in [1] for the blurred reconstruction scenario and propose a revised deeper architecture that proves its superiority experimentally both when the levels of blur are known and unknown a priori.

IGTM67 - EEG Pathology Detection using on Deep CNN

ABSTRACT -With the advancement of machine learning technologies, particularly deep learning, the automated systems to assist human life are flourishing. In this paper, we propose an automatic electroencephalogram (EEG) pathology detection system based on deep learning. Various types of pathologies can affect brain signals. Thus, the brain signals captured in the form of EEG signals can indicate whether a person suffers from pathology or not. In the proposed system, the raw EEG signals are processed in the form of a spatio-temporal representation. The spatio-temporal form of the EEG signals is the input to a convolutional neural network (CNN). Two different CNN models, namely, a shallow model and a deep model, are investigated using transfer learning. A fusion strategy based on a multilayer perceptron is also investigated.

IGTM68 - Real-Time Vehicle Make and Model Recognition using CNN

ABSTRACT -Make and model recognition (MMR) of vehicles plays an important role in automatic vision-based applications. This research work proposed a novel deep learning approach (DL) for MMR. The frontal views of vehicle images are first extracted and fed into a CNN layer for training and testing. In this work CNN architecture have been employed for this work, which makes our MMR system more efficient. The experimental results on our collected large-scale vehicle datasets indicate that the proposed model can achieves good recognition rate at the rank-1 level. For inference tasks, the deployed deep

model requires less than 5 MB of space and thus has a great viability in real-time applications.

IGTM69 - Fake Review Detection using Classification Using Machine Learning Techniques

ABSTRACT -In today's world, where Internet has become a household convenience, online reviews have become a critical tool for businesses to control their online reputation. Reviewing has changed the face of marketing in this new era. Nowadays, most companies invest money in mining the reviews to gain insights into customer preferences as well as to gain competitive intelligence and are hiring individuals to write fake reviews. The fraudsters‟ activities mislead potential customers and organizations reshaping their businesses and prevent opinion-mining techniques from reaching accurate conclusions. Thus, it has become essential to detect fake reviews to bring to surface the true product opinion. This paper focuses on product reviews and detecting spam fake reviews among them using supervised learning techniques using synthetic fake reviews (to cover all types) as a training set.

IGTM70 - Heart Disease Prediction Using Artificial Neural Network

ABSTRACT -Mortality rate increases all over the world on daily basis. The reasons for this could be increase in the numbers of patient with cardiovascular disease. When considering death rates and large number of people who suffers from heart disease, it is revealed how important early diagnosis of heart disease. Traditional way of predicting Heart disease is doctor's examination or number of medical tests such as ECG, Stress Test, and Heart MRI etc. Nowadays, Health care industry contains huge amount of heath care data, which contains hidden information. This hidden information is useful for making effective decisions. Computer based information along with advanced Data mining techniques are used for appropriate results. Neural network is widely used tool for

predicting Heart disease diagnosis. In this paper, a heart disease prediction system which uses artificial neural network backpropagation algorithm is proposed. 13 clinical features were used as input for the neural network and then the neural network was trained with back propagation algorithm to predict absence or presence of heart disease with accuracy of 95%.

IGTM71 - Analysis and Prediction of Crimes by Clustering and Classification

ABSTRACT -To be better prepared to respond to criminal activity, it is important to understand patterns in crime. In our project, we analyze crime data from the Indian cities, drawn from a publicly available dataset. At the outset, the task is to predict which category of crime is most likely to occur given a time and place in India. To overcome the limitations imposed by our limited set of features. We also attempt to make our classification task more meaningful by merging multiple classes into larger classes implement data mining framework works with the crime and helps to improve the productivity of the detectives and other law enforcement officers. This system can also be used for the Indian crime departments for reducing the crime and solving the crimes with less time

IGTM72 - Crop Yield Prediction and Efficient use of Fertilizers

ABSTRACT -India being an agriculture country, its economy predominantly depends on agriculture yield growth and agroindustry products. Data Mining is an emerging research field in crop yield analysis. Yield prediction is a very important issue in agricultural. Any farmer is interested in knowing how much yield he is about to expect. Analyze the various related attributes like location, pH value from which alkalinity of the soil is determined. Along with it, percentage of nutrients like Nitrogen (N), Phosphorous (P), and Potassium (K) Location is used along with the use of third-party applications like APIs for weather and temperature, type of soil, nutrient value of the soil in that region, amount of rainfall

in the region, soil composition can be determined. All these attributes of data will be analyzed train the data with various suitable machine learning algorithms for creating a model. The system comes with a model to be precise and accurate in predicting crop yield and deliver the end user with proper recommendations about required fertilizer ratio based on atmospheric and soil parameters of the land, which enhance to increase the crop yield and increase farmer revenue.

IGTM73 - Face Feature Extractor for Emotion Analysis and Behavior Analysis of a Prisoner

ABSTRACT -Facial Emotion Recognition has been a very significant issue and an advanced area of research in the field of Human- Machine Interaction and Image Processing. Human-Machine relation is a major field for that different approaches have been proposed for developing methods for recognition of automated facial emotion analysis using not only facial expressions, also speech recognition. Facial expression detection the multiple varieties of human faces like texture, color, shape, expressions etc. are considered. Firstly, to detect a facial emotions of the human with variations in the facial movements including mouth, eyes, and nose are to be determined and after that considering those features using a very good classifier to recognize the human emotions. This paper gives a brief summary of emotion recognition methods like Feature Fusion, Deep Auto-Encoder, Sigma Pi-Neural Network, Genetic Algorithm, PHOG and Hierarchical Expression Model etc. which are used to recognize human emotions are presented. Keywords

IGTM74 - Machine Learning Methods for Malware Detection and Classification

ABSTRACT -Malware detection is an important factor in the security of the computer systems. However, currently utilized signature-based methods cannot provide accurate detection of zero-day attacks and polymorphic viruses. That is why the need for machine

learning-based detection arises.The purpose of this work was to determine the best feature extraction, feature representation, and classification methods that result in the best accuracy when used on the top of Cuckoo Sandbox. Specifically, Decision Trees and Random Forest classifiers were evaluated. The dataset used for this study consistsed of the 1156 malware files of 9 families of different types and 984 benign files of various formats.This work presents recommended methods for machine learning based malware classification and detection, as well as the guidelines for its implementation. Moreover, the study performed can be useful as a base for further research in the field of malware analysis with machine learning methods.

IGTM75 - Development of food tracking system using Machine Learning

ABSTRACT -Whenever we are thinking about any programmable devices then the embedded technology comes into forefront. The embedded technology is now a day's very much popular and most of the products were developed with microcontroller or microprocessor based embedded technology. This system is used to food tracking system using machine learning. A correct balance of nutrient intake is very important, particularly in infants. When the body is deprived of essential nutrients, it can lead to serious disease and organ deterioration which can cause serious health issues in adulthood. Automated monitoring of the nutritional content of food provided to infants, not only at home but also in day care facilities, is essential for their healthy development.

The system tackles different aspects of image food analysis such as food localization, classification and retrieval. Results show that a complete system that integrates our solutions can be effectively exploited for supporting user in keeping track of their daily food consumption in uncontrolled environment (i.e. in the wild).

IGTM76 - Kervolutional Neural Networks

ABSTRACT -Convolutional neural networks (CNNs) have enabled the state-of-the-art performance in many computer vision tasks. However, little effort has been devoted to establishing convolution in non-linear space. Existing works mainly leverage on the activation layers, which can only provide point-wise non-linearity. To solve this problem, a new operation, kervolution (kernel convolution), is introduced to approximate complex behaviors of human perception systems leveraging on the kernel trick. It generalizes convolution, enhances the model capacity, and captures higher order interactions of features, via patch-wise kernel functions, but without introducing additional parameters. Extensive experiments show that Kervolutional neural networks (KNN) achieve higher accuracy and faster convergence than baseline CNN.

IGTM77 - SUBSPECTRALNET– USING SUB-SPECTROGRAM BASED CONVOLUTIONAL NEURAL NETWORKS FOR ACOUSTIC SCENE CLASSIFICATION

ABSTRACT -Acoustic Scene Classification (ASC) is one of the core research problems in the field of Computational Sound Scene Analysis. In this work, we present SubSpectral Net, a novel model which captures discriminative features by incorporating frequency band-level differences to model soundscapes. Using mel-spectrograms, we propose the idea of using band-wise crops of the input time-frequency representations and train a convolutional neural network (CNN) on the same. We also propose a modification in the training method for more efficient learning of the CNN models. We first give a motivation for using sub-spectrograms by giving intuitive and statistical analyses and finally we develop a sub-spectrogram based CNN architecture for ASC. The system is evaluated on the public ASC development dataset provided for the "Detection and Classification of Acoustic Scenes and Events" (DCASE) 2018 Challenge. Our best model

achieves an improvement of +14% in terms of classification accuracy with respect to the DCASE 2018 baseline system.

IGTM78 - Locality-constrained Linear Coding based Fused Visual Features for Robust Acoustic Event Classification

ABSTRACT -In this paper, a novel Fused Visual Features (FVFs) are proposed for Acoustic Event Classification (AEC) in the meetingroom and office environments. The codes of Visual Features (VFs) are evaluated from row vectors and Scale Invariant Feature Transform (SIFT) vectors of the grayscale Gammatonegram of an acoustic event separately using Locality-constrained Linear Coding (LLC). Further, VFs from row vectors and SIFT vectors of the grayscale Gammatonegram are fused to get FVFs.Performance of the proposed FVFs is evaluated on acoustic events of publicly available UPC-TALP and DCASE datasets in clean and noisy conditions. Results show that proposed FVFs are robust to noise and achieve overall recognition accuracy of 96.40% and 90.45% on UPC-TALP and DCASE datasets, respectively.

IGTM79 - Emotion Recognition on Twitter – Comparative Study

ABSTRACT -The application uses Machine Learning algorithm to classify the sentiments of the twitter messages using Machine Learning Algorithms – Naïve Bayes, Random Forest, Support Vector Machine, Logistic Regression and Deep Neural Networks – RNN and CNN, The study also compares the accuracy of these different algorithms

IGTM80 - Breast Cancer Detection Using Machine Learning Algorithms

ABSTRACT -The most frequently occurring cancer among Indian women is breast cancer. There is a chance of fifty percent for fatality in a case as one of two women diagnosed with breast cancer die in the cases of Indian women [1]. This paper aims to present comparison of the largely popular machine learning algorithms and techniques

commonly used for breast cancer prediction, namely Random Forest, kNN (k-Nearest-Neighbor) and Naïve Bayes. The Wisconsin Diagnosis Breast Cancer data setwas used as a training set to compare the performance of the various machine learning techniques in terms of key parameters such as accuracy, and precision. The results obtained are very competitive and can be used for detection and treatment.

IGTM81 - Detecting Fake News in Social Media Networks

ABSTRACT -Fake news and hoaxes have been there since before the advent of the Internet. The widely accepted definition of Internet fake news is: fictitious articles deliberately fabricated to deceive readers". Social media and news outlets publish fake news to increase readership or as part of psychological warfare. In general, the goal is profiting through click baits. Click baits lure users and entice curiosity with flashy headlines or designs to click links to increase advertisements revenues. This exposition analyzes the prevalence of fake news in light of the advances in communication made possible by the emergence of social networking sites. The purpose of the work is to come up with a solution that can be utilized by users to detect and filter out sites containing false and misleading information. We use simple and carefully selected features of the title and post to accurately identify fake posts. The experimental results show a 99.4% accuracy using logistic classifier.

IGTM82 - Automatic detection of plant disease for paddy leaves using Image Processing Techniques

ABSTRACT -Agricultural productivity is something on which economy highly depends. This is the one of the reasons that disease detection in plants plays an important role in agriculture field, as having disease in plants are quite natural. If proper care is not taken in this area then it causes serious effects on plants and due to which respective product quality, quantity or productivity is affected. For instance a disease named little leaf disease

is a hazardous disease found in pine trees in United States. Detection of plant disease through some automatic technique is beneficial as it reduces a large work of monitoring in big farms of crops, and at very early stage itself it detects the symptoms of diseases i.e. when they appear on plant leaves. This proposed work presents an algorithm for image segmentation technique which is used for automatic detection and classification of plant leaf diseases. It also covers survey on different diseases classification techniques that can be used for plant leaf disease detection. Image segmentation, which is an important aspect for disease detection in plant leaf disease, is done by using genetic algorithm.

IGTM83 - An Efficient Spam Detection Technique for IoT Devices using Machine Learning

ABSTRACT -IThe Internet of Things (IoT) is a group of millions of devices having sensors and actuators linked over wired or wireless channel for data transmission. IoT has grown rapidly over the past decade with more than 25 billion devices are expected to be connected by 2020. The volume of data released from these devices will increase manyfold in the years to come. In addition to an increased volume, the IoT devices produces a large amount of data with a number of different modalities having varying data quality defined by its speed in terms of time and position dependency. In such an environment, machine learning algorithms can play an important role in ensuring security and authorization based on biotechnology, anomalous detection to improve the usability and security of IoT systems. On the other hand, attackers often view learning algorithms to exploit the vulnerabilities in smart IoT-based systems.

IGTM84 - Predicting Flight Delays with Error Calculation using Machine Learned Classifiers

Abstract-Flight delay is a major problem in the aviation sector. During the last two decades, the growth of the aviation sector has caused air traffic congestion, which has caused flight delays. Flight delays result not only in the loss of fortune also negatively

impact the environment. Flight delays also cause significant losses for airlines operating commercial flights. Therefore, they do everything possible in the prevention or avoidance of delays and cancellations of flights by taking some measures. In this paper, using machine learning models such as Logistic Regression, Decision Tree Regression, Bayesian Ridge, Random Forest Regression and Gradient Boosting Regression we predict whether the arrival of a particular flight will be delayed or not.

IGTM85 - KOLLECTOR Detecting Fraudulent Activities on Mobile Devices Using Deep Learning

Abstract-With the rapid growth in smartphone usage, preventing leakage of personal information and privacy has become a challenging task. One major consequence of such leakage is impersonation. This type of illegal usage is nearly impossible to prevent as existing preventive mechanisms (e.g., passcode and fingerprinting), are not capable of continuously monitoring usage and determining whether the user is authorized. Once unauthorized users can defeat the initial protection mechanisms, they would have full access to the devices including using stored passwords to access high-value websites. We present KOLLECTOR, a new framework to detect impersonation based on a multi-view bagging deep learning approach to capture sequential tapping information on the smart-phone's keyboard. We construct a sequential-tapping biometrics model to continuously authenticate the user while typing. We empirically evaluated our system using real-world phone usage sessions from 26 users over eight weeks. We then compared our model against commonly used shallow machine techniques and find that our system performs better than other approaches and can achieve an 8.42% equal error rate, a 94.24% accuracy and a 94.41% H-mean using only the accelerometer and only five keyboard taps. We also experiment with using only three keyboard taps and find that the system still yields high accuracy while giving additional opportunities to make more decisions that can result in more accurate final decisions.

IGTM86 - Movie Recommendation System Using Sentiment Analysis from Micro blogging Data

Abstract-Recommendation systems (RSs) have garnered immense interest for applications in e-commerce and digital media. Traditional approaches in RSs include such as collaborative filtering (CF) and content-based filtering (CBF) through these approaches that have certain limitations, such as the necessity of prior user history and habits for performing the task of recommendation. To minimize the effect of such limitation, this article proposes a hybrid RS for the movies that leverage the best of concepts used from CF and CBF along with sentiment analysis of tweets from microblogging sites. The purpose to use movie tweets is to understand the current trends, public sentiment, and user response of the movie. Experiments conducted on the public database have yielded promising results.

IGTM87 - Alzheimer Disease Classification Using Deep Learning with Gabor Filter

Abstract-Alzheimer disease is the one amongst neurodegenerative disorders. Though the symptoms are benign initially, they become more severe over time. Alzheimer's disease is a prevalent sort of dementia. This disease is challenging one because there is no treatment for the disease. Diagnosis of the disease is done but that too at the later stage only. If the disease is predicted earlier, the progression or the symptoms of the disease can be slow down. This paper uses Deep learning algorithms to predict the Alzheimer disease using MRI images. This paper we proposed deep learning algorithm CNN along with that we used Gabor filter for extract the feature from MRI images and make use of all this we are able to achieve high accuracy.

IGTM88 - Collaborative Filtering-Based Electricity Plan Recommender System

Abstract- Owning to electricity market deregulation, residential customers now enjoy the freedom to choose their preferred electricity retailers. This paper investigates the application of recommender system, a fast-developing technique in machine learning, into the task of recommending electricity plans for the individual residential customer. Based on a collaborative filtering strategy, an electricity plan recommender system (EPRS) is developed. By providing easily obtainable data of some household appliances, residential customers of the EPRS are recommended with predicted ratings of different plans, which can provide effective guidance to customers in the selection of suitable plans and proper tariffs. Different numerical tests are carried out to evaluate the performance of the EPRS. The EPRS outperforms other strategies in the accuracy of recommendation result and is verified to be a promising solution to electricity plan recommendation task.

IGTM89 - Serendipity—A Machine-Learning Application for Mining Serendipitous Drug Usage from Social Media

Abstract-Serendipitous drug usage refers to the unexpected relief of comorbid diseases or symptoms when taking medication for a different known indication. Historically, serendipity has contributed significantly to identifying many new drug indications. If patient-reported serendipitous drug usage in social media could be computationally identified, it could help generate and validate drug-repositioning hypotheses. We investigated deep neural network models for mining serendipitous drug usage from social media. We used the word2vec algorithm to construct word-embedding features from drug reviews posted in a WebMD patient forum. We adapted and redesigned the convolutional neural network, long short-term memory network, and convolutional long short-term memory network by adding contextual information extracted from drug-review posts, information-filtering tools, medical ontology, and medical knowledge. We

trained, tuned, and evaluated our models with a gold-standard dataset of 15714 sentences (447 [2.8%] describing serendipitous drug usage). Additionally, we compared our deep neural networks to support vector machine, random forest, and AdaBoost.M1 algorithms. Context information helped to reduce the false-positive rate of deep neural network models. If we used an extremely imbalanced dataset with limited instances of serendipitous drug usage, deep neural network models did not outperform other machine-learning models with n-gram and context features. However, deep neural network models could more effectively use word embedding in feature construction, an advantage that makes them worthy of further investigation. Finally, we implemented natural-language processing and machine-learning methods in a web-based application to help scientists and software developers mine social media for serendipitous drug usage.

IGTM90 - Predicting the Cricket Match Outcome Using Crowd Opinions on Social Networks: A Comparative Study of Machine Learning Methods

Abstract-Social media has become a platform of first choice where one can express his/her feelings with freedom. The sports and matches being played are also discussed on social media such as Twitter. In this article, efforts are made to investigate the feasibility of using collective knowledge obtained from micro posts posted on Twitter to predict the winner of a cricket match. For predictions, we use three different methods that depend on the total number of tweets before the game for each team, fans sentiments toward each team and fans score predictions on Twitter. By combining these three methods, we classify winning team prediction in a cricket game before the start of game. Our results are promising enough to be used for winning team forecast. Furthermore, the effectiveness of supervised learning algorithms is evaluated for

classifiers where Support Vector Machine (SVM) has shown advantage over other classifiers.

IGTM91 - Fake Profile Identification in Online Social Networks

Abstract-There is a tremendous increase in technologies these days.. Mobiles are becoming smart. Technology is associated with online social networks which has become a part in every one's life in making new friends and keeping friends, their interests are known easier. But this increase in networking online make many problems like faking their profiles, online impersonation having become more and more in present days. Users are fed with more unnecessary knowledge during surfing which are posted by fake users. Researches have observed that 20% to 40% profiles in online social networks like facebook are fake profiles. Thus this detection of fake profiles in online social networks results into solution using frameworks.

IGTM92 - Automatic Detection and Classification of Weaving Fabric Defects Based on Digital Image Processing

Abstract-this paper describes the detection and classification of fabric defects based on digital image processing. The work is intended to provide the higher speed and accuracy of defect detection than human vision and to find the source of the defects. At first, we find the size and position of wefts or warps from an image. Then calculate the pattern of weft and warp positions and figure out whether there is a defect or not. The patterns of weft and warp may differ based on the type of fabrics. Sample pattern of good fabric is used to detect and classify the defect of the fabric with same pattern. OpenCV library and python programming language is used for the experiment. Seven kinds of defects on the fabrics model images are detected and five real fabric images are used for the experiment. The experiment shows the result of successful defect detection with 95% rate, and it is 50% faster than human vision in fabrics density calculation.

IGTM93 - A Review on Student Placement Chance Prediction

Abstract— All students dream to obtain a job offer in their hands before they leave their college. A placement chance predictor helps students to have an idea about where they stand and what to be done to obtain a good placement. A placement predictor is a system that could predict the possibility or the type of company a pre-final year student have chances to be placed. Thus a prediction system could help in the academic planning of an institution for future years. With the emergence of data mining and machine learning, many predictor models were introduced by analyzing the previous year student's dataset. This paper presents a literature survey on different placement prediction models for pre-final year engineering graduate students

IGTM94 - Fast Detection of Multiple Objects in Traffic Scenes with a Common Detection Framework

Abstract-Traffic scene perception (TSP) aims to real-time extract accurate on-road environment information, which in- volves three phases: detection of objects of interest, recognition of detected objects, and tracking of objects in motion. Since recognition and tracking often rely on the results from detection, the ability to detect objects of interest effectively plays a crucial role in TSP. In this paper, we focus on three important classes of objects: traffic signs, cars, and cyclists. We propose to detect all the three important objects in a single learning based detection framework. The proposed framework consists of a dense feature extractor and detectors of three important classes. Once the dense features have been extracted, these features are shared with all detectors. The advantage of using one common framework is that the detection speed is much faster, since all dense features need only to be evaluated once in the testing phase. In contrast, most previous works have designed specific detectors using different features for each of these objects. To enhance the feature robustness to noises and image deformations, we introduce

spatially pooled features as a part of aggregated channel features. In order to further improve the generalization performance, we propose an object sub categorization method as a means of capturing intra-class variation of objects. We experimentally demonstrate the effectiveness and efficiency of the proposed framework in three detection applications: traffic sign detection, car detection, and cyclist detection. The proposed framework achieves the competitive performance with state-of- the-art approaches on several benchmark datasets.

IGTM95 - Automatic Visual Features for Writer Identification: A Deep Learning Approach

Abstract-Identification of a person from his writing is one of the challenging problems; however, it is not new. No one can repudiate its applications in a number of domains, such as forensic analysis, historical documents, and ancient manuscripts. Deep learning-based approaches have proved as the best feature extractors from massive amounts of heterogeneous data and provide promising and surprising predictions of patterns as compared with traditional approaches. We apply a deep transfer convolutional neural network (CNN) to identify a writer using handwriting text line images in English and Arabic languages. We evaluate different freeze layers of CNN (Conv3, Conv4, Conv5, Fc6, Fc7, and fusion of Fc6 and Fc7) affecting the identification rate of the writer. In this paper, transfer learning is applied as a pioneer study using ImageNet (base data-set) and QUWI data-set (target data-set). To decrease the chance of over-fitting, data augmentation techniques are applied like contours, negatives, and sharpness using text-line images of target data-set. The sliding window approach is used to make patches as an input unit to the CNN model. The AlexNet architecture is employed to extract discriminating visual features from multiple representations of image patches generated by enhanced pre-processing techniques. The extracted features from patches are then fed to a support vector machine classifier. We realized the highest accuracy using freeze Conv5 layer up to

92.78% on English, 92.20% on Arabic, and 88.11% on the combination of Arabic and English, respectively.

IGTM96 - A Predictive Tool for Grid Data Analysis Using Machine Learning Algorithms

Abstract-Power and energy sectors are collecting vast amount of data from different sources and trying to use computational tools to analyze and identify useful patterns in the data collected. Some of challenges observed with such big data are high volume, heterogeneous, and rapidly growing data. To efficiently handle such big data, machine learning algorithms are used. In this paper, such machine learning algorithms are used to predict patterns in the grid data collected from the Distributed Energy Resources (DER) at a local electrical engineering company. Predictive framework developed to preprocess the big data, classify the test and training datasets, and the application of different machine learning algorithms is discussed in this paper. The results obtained after analyzing the big data with different machine learning algorithms are also discussed in this paper.

IGTM97 - Groundwater Level Prediction Using Artificial Neural Network Model

Abstract- Forecasting of stream flow and ground water level changes became an important component of water resources system control and challenging task for water resources engineers and managers. The ground water level data and rainfall data of twenty years from 1996 to 2015 were collected. Artificial neural network (ANN) is used to predict water resources variable.

IGTM98 - Quantifying COVID-19 Content in the Online Health Opinion War Using Machine Learning

Abstract-A huge amount of potentially dangerous COVID-19 misinformation is appearing online. Here we use machine learning to quantify COVID-19 content among

online opponents of establishment health guidance, in particular vaccinations ("anti-vax"). We find that the anti-vax community is developing a less focused debate around COVID-19 than its counterpart, the pro-vaccination ("pro-vax") community. However, the anti-vax community exhibits a broader range of "flavors" of COVID-19 topics, and hence can appeal to a broader cross-section of individuals seeking COVID-19 guidance online, e.g. individuals wary of a mandatory fast-tracked COVID-19 vaccine or those seeking alternative remedies. Hence the anti-vax community looks better positioned to attract fresh support going forward than the pro-vax community. This is concerning since a widespread lack of adoption of a COVID-19 vaccine will mean the world falls short of providing herd immunity, leaving countries open to future COVID-19 resurgences. We provide a mechanistic model that interprets these results and could help in assessing the likely efficacy of intervention strategies. Our approach is scalable and hence tackles the urgent problem facing social media platforms of having to analyze huge volumes of online health misinformation and disinformation.

IGTM99 - Crime Prediction and Analysis Using Machine Learning

Abstract - Crime is one of the biggest and dominating problem in our society and its prevention is an important task. Daily there are huge numbers of crimes committed frequently. This require keeping track of all the crimes and maintaining a database for same which may be used for future reference. The current problem faced are maintaining of proper dataset of crime and analyzing this data to help in predicting and solving crimes in future. The objective of this project is to analyze dataset which consist of numerous crimes and predicting the type of crime which may happen in future depending upon various conditions. In this project, we will be using the technique of machine learning and data science for crime prediction of Chicago crime data set. The crime data is extracted from the official portal of Chicago police. It consists of crime information like location

description, type of crime, date, time, latitude, longitude. Before training of the model data preprocessing will be done following this feature selection and scaling will be done so that accuracy obtain will be high. The K-Nearest Neighbor (KNN) classification and various other algorithms will be tested for crime prediction and one with better accuracy will be used for training. Visualization of dataset will be done in terms of graphical representation of many cases for example at which time the criminal rates are high or at which month the criminal activities are high. The soul purpose of this project is to give a jest idea of how machine learning can be used by the law enforcement agencies to detect, predict and solve crimes at a much faster rate and thus reduces the crime rate. It not restricted to Chicago, this can be used in other states or countries depending upon the availability of the dataset.

IGTM100 - Duplicate Question Detection with Deep Learning in Stack Overflow

Abstract-Stack Overflow is a popular Community-based Question Answer (CQA) website focused on software programming and has attracted more and more users in recent years. However, duplicate questions frequently appear in Stack Overflow and they are manually marked by the users with high reputation. Automatic duplicate question detection alleviates labor and effort for users with high reputation. Although existing approaches extract textual features to automatically detect duplicate questions, these approaches are limited since semantic information could be lost. To tackle this problem, we explore the use of powerful deep learning techniques, including Convolutional Neural Networks (CNN), Recurrent Neural Networks (RNN) and Long Short-Term Memory (LSTM), to detect duplicate questions in Stack Overflow. In addition, we use Word2Vec to obtain the vector representations of words. They can fully capture semantic information at document-level and word-level respectively. Therefore, we construct three deep learning approaches WV-CNN, WV-RNN and WV-LSTM, which are based on Word2Vec, CNN, RNN and LSTM, to detect duplicate questions in Stack Overflow. Evaluation results show that WV-CNN and

WV-LSTM have made significant improvements over four baseline approaches (i.e., DupPredictor, Dupe, DupPredictorRep-T, and DupeRep) and three deep learning approaches (i.e., DQ-CNN, DQ-RNN, and DQ-LSTM) in terms of recall-rate@5, recall-rate@10 and recall-rate@20. Furthermore, the experimental results indicate that our approaches WV-CNN, WV-RNN, and WV-LSTM outperform four machine learning approaches based on Support Vector Machine, Logic Regression, Random Forest and eXtreme Gradient Boosting in terms of recall-rate@5, recall-rate@10 and recall-rate@20.

IGTM101 - Identification of COVID-19 Spreaders Using Multiplex Networks Approach

ABSTRACT -In this work, we present a methodology to identify COVID-19 spreaders using the analysis of the relationship between socio-cultural and economic characteristics with the number of infections and deaths caused by the COVID-19 virus in different countries. For this, we analyze the information of each country using the complex networks approach, specifically by analyzing the spreaders countries based on the separator set in 5-layer multiplex networks. The results show that, we obtain a classification of the countries based on their numerical values in socioeconomics, population, Gross Domestic Product (GDP), health and air connections; where, in the spreader set there are those countries that have high, medium or low values in the different characteristics; however, the aspect that all the countries belonging to the separator set share is a high value in air connections.

IGTM102 - Prediction of Hospital Admission Using Machine Learning

ABSTRACT - people will face many problems in Hospitals while taking Admission. If it is in a popular hospital, they should wait hours together to take just admission. But it is not at all good at Emergency Department. Very serious cases will admit in Emergency Department. So, we need to use more innovation technique to ameliorate patient flow

and prevent Overflowing. So, data mining techniques will show us a pleasant method to predict the ED Admissions. Here we analyzed an algorithm for predicting models i.e. Naive Bayes, Random Forests, and Support Vector Machine. For the prediction, we should identify a handful of factors associated to Hospital admission including age, gender, systolic pressure, and diastolic pressure, and diabetes, previous records in the preceding month or year, admission. We also say about the algorithms, which we used in detail. We use Random Forests algorithm for classifying the data into categories for improving the accuracy of prediction. Naive Bayes is used to identify the probabilities for each attribute and helps in predicting the outcome. Support Vector machine is used to classify the given input particular category, which helps in predicting the outcome.

IGTM103 - Flower species recognition system using convolution neural networks and transfer learning

ABSTRACT -Automatic identification and recognition of medicinal plant species in environments such as forests, mountains and dense regions is necessary to know about their existence. In recent years, plant species recognition is carried out based on the shape, geometry and texture of various plant parts such as leaves, stem, flowers etc. Flower based plant species identification systems are widely used. While modern search engines provide methods to visually search for a query image that contains a flower, it lacks in robustness because of the intra-class variation among millions of flower species around the world. Hence, in this proposed research work, a Deep learning approach using Convolutional Neural Networks (CNN) is used to recognize flower species with high accuracy. Images of the plant species are acquired using the built-in camera module of a mobile phone. Feature extraction of flower images is performed using a Transfer Learning approach (i.e. extraction of complex features from a pre-trained network). A machine learning classifier such as Logistic Regression or Random Forest is used on top of it to yield a higher accuracy rate. This approach helps in minimizing the hardware requirement

needed to perform the computationally intensive task of training a CNN. It is observed that, CNN combined with Transfer Learning approach as feature extractor outperforms all the handcrafted feature extraction methods such as Local Binary Pattern (LBP), Color Channel Statistics, Color Histograms, Haralick Texture, Hu Moments and Zernike Moments. CNN combined with Transfer Learning approach yields impressive Rank-1 accuracies of 73.05%, 93.41% and 90.60% using Over Feat, Inception-v3 and Exception architectures, respectively as Feature Extractors on FLOWERS102 dataset.

IGTM104 - DeepAge: Deep Learning of face-based age estimation

ABSTRACT -The estimation of a person's age based on a face image is a common biometric task conducted effortlessly by human observers. We present a dual Convolutional Neural Network (CNN) and Support Vector Regression (SVR) approach for face-based age estimation. A CNN is trained for representation learning, followed by Metric Learning, after which SVR is applied to the learned features. This allows overcoming the lack of large datasets with age annotations, by initially training the CNN for face recognition. The proposed scheme was applied to the MORPH-II and FG-Net datasets and compares favorably with contemporary state-of-the-art approaches. In particular, we show that domain adaptation, which is essential for analyzing small-scale datasets, such as the FG-Net, can be achieved by retraining the SVR layer, rather than the CNN.

IGTM105 - Weapon Detection using Artificial Intelligence and Deep Learning for Security Applications

ABSTRACT -Security is always a main concern in every domain, due to a rise in crime rate in a crowded event or suspicious lonely areas. Abnormal detection and monitoring have major applications of computer vision to tackle various problems. Due to growing demand in the protection of safety, security and personal properties, needs and deployment of video surveillance systems can recognize and interpret the scene and anomaly events play a vital role in intelligence monitoring. This paper implements

automatic gun (or) weapon detection using a convolution neural network (CNN) based SSD and Faster RCNN algorithms. Proposed implementation uses two types of datasets. One dataset, which had pre-labelled images and the other one, is a set of images, which were labelled manually. Results are tabulated, both algorithms achieve good accuracy, but their application in real situations can be based on the trade-off between speed and accuracy.

ACADEMIC PROJECTS:

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