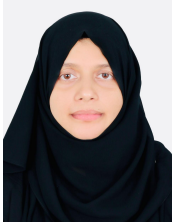


Parallel convolutional neural network and hybrid architectures for accented speech recognition in Malayalam

Rizwana K.T, V.K Muneer & Premijith B

Iran Journal of Computer Science, Nov 2024



Dr. Rizwana K.T



Dr. V.K Muneer

ABSTRACT

This study investigates different approaches to recognizing accented speech for the Malayalam language, a language spoken in the southern region of India. A dataset was constructed for different language accents to conduct the study since there were no freely available datasets in the domain. The data collected has been preprocessed by applying band-pass filters and audio normalization. The speech dataset has been augmented using time-stretching, pitch shifting, and adding Gaussian noise. A total of 585 acoustic features have been extracted from the speech signals using adaptive fast Fourier transform (FFT) window size, spectral contrast, Tonnetz and polyfeatures, harmonic-to-noise ratio (HNR) and formants, zero-crossing rate (ZCR) and short-term Fourier transform, root mean square (RMS) and Mel spectrogram, and Mel-frequency cepstral coefficients (MFCC) and its deltas. Five accented models were constructed using a 2D parallel convolutional neural network (CNN), 4D parallel CNN without attention block, 4D parallel CNN with attention block, Bidirectional long short-term memory, and CNN–long short-term memory hybrid methods. The accented models constructed using 4D Parallel with attention block and hybrid CNN–long short-term memory architecture exhibited better performance with high accuracy and low error rates among all the five model architectures.

Journal Article

An efficient GS-RBFN framework for early prediction and classification of AD

Haulath K & Mohamed Basheer KP

Multimedia Tools and Applications, 11042-024-19168x



Dr. K.P.M Basheer



Haulath

ABSTRACT

A progressive brain disorder, which eventually destroys memory cells, is termed Alzheimer's Disease (AD). AD causes memory loss and other regular activities. Due to the variations in cytoarchitecture, the categorical labeling of various tissues presents a difficult task in AD classification. For addressing this challenge, this paper proposes a new GELU and SWISH-based Radial Basis Function Network (GS-RBFN)-centric early prediction and classification of AD. For classifying AD into Mild Cognitive Impairment (MCI), AD, and Control Normal (CN), the proposed model deploys image pre-processing, segmentation, morphological operation, data augmentation, image representation extraction, feature selection, and classification steps. Primarily, images are gathered from the Alzheimer's Disease Neuroimaging Initiative (ADNI) dataset. Next, by utilizing normalization, skull removal, and spatial smoothing approaches, the images are pre-processed. Then, by using the Brownian Log Scaling Archimedes Optimization-based Watershed Segmentation (BLSAOWS), significant brain tissues are segmented. After that, using morphological operations, the segmented images are enhanced. Through the experimental analysis, the proposed model's efficiency is determined. Thus, the proposed GS-RBFN proficiently predicts AD individuals with an accuracy, precision, and sensitivity of 98.45%, 98.44%, and 98.44%, respectively. The proposed GS-RBFN achieved a less computation time of 14876 ms. Furthermore, the proposed BSRISRHSO obtained a minimum feature selection time of 24012 ms. The Proposed BLSAOWS acquired a high efficiency of 98%. Also, the proposed model acquired superior accuracy that outperformed all baseline techniques. Thus, the experimental results revealed that the research methodology obtained more impressive outcomes in AD prediction.

Journal Article



Conversion as Resistance: The role of Casteism in the Social Formation of the Mappila Community in Malabar

Musthafa Farook P.

International Journal of Cultural Studies and Social Sciences, Vol. 20, Issue. 1



Dr. Musthafa Farooq

ABSTRACT

The social formation of the Muslim community- Mappilas- began in 12th century onwards. The encounters between the Portuguese and the Muslim traders during the Sixteenth century forced many Muslims to migrate to the hinterlands where the Muslims swelled in number. In the 18th and 19th centuries, the number steadily increased and by the period of the Independence of India, they became a major section that could exert much influence in the socio-political life of Kerala. The evolution of the Muslim community in Kerala is the product of various socio-cultural and political factors. The community is composed of two social groups: (1) the immigrants from the Arab lands, and (2) the converts from Hindu religion. The immigrants were few in number and most of them married native women, and these immigrants and the progeny in their new relationships were the early Muslim community in the land. The second section, the largest, is the converts to Islam from the native Hindu religion who embraced the new faith due to social, economic and political reasons. This essay makes an attempt to analyze the sociological elements that contributed to the widespread conversions and the expansion of the Mappila community in Malabar.

Journal Article



Navigating the Tides of History: The Significance of Thuhfathul Mujahideen in the Struggle against Portuguese Colonialism

Musthafa Farook P.

Lalita Kavi-Bharathi, Vol. XII, Issue. 1



Dr. Musthafa Farooq

ABSTRACT

This essay investigates the intricate political situation in Malabar just before the Portuguese arrived in the late 15th century focusing on the region's active trade connections with the Arab lands. The Mappila population, highly engaged in commerce, played a pivotal role as mediators. The Portuguese entry in the 16th century caused a disturbance in this balance, resulting in a war with the Mappilas, who were led by influential Muslim ulama. This essay explores the influence of ulama in shaping Mappila society and their role in resisting the Portuguese with a focus on Sheikh Zainuddin Makhdam Junior's influential work, "Tuhfatul Muahideenfi' Ba 'di Akhbairi al Burtugaliyyeen." This treatise, the first authentic history of Kerala written by a Keralite, presents political thoughts and ideological foundations for anti-imperialist resistance. Zainuddin underscores the imperative of engaging in jihad as a responsibility in countering foreign aggressors, while also condemning the heinous acts perpetrated by the Portuguese.

Journal Article



حقوق المرأة المسلمة في المجال السياسي: دراسة تحليلية

Jabir AM

kalikoot, vol:14 Issue :01



Dr. Jabir Amani

ABSTRACT

Women hold a significant position in society alongside men, with both genders having their respective roles. Women possess the legal freedom to engage in various activities and lead initiatives in different spheres such as religion, charity, politics, culture, and more, often considering these responsibilities as duties.

However, the concept of liberalism advocates for extensive freedom without constraints or limitations. Proponents of liberalism argue that men and women are equal in body and spirit and should have equal freedom in all aspects of life. Women are encouraged to actively participate in all facets of social life, mirroring the involvement of men. This liberal perspective on freedom, though, is not inherently aligned with the teachings of Islam, which places specific emphasis on gender roles and responsibilities. In contrast, traditionalism tends to restrict women's social interactions, confining them within the walls of their homes. Women are often prohibited from meeting or engaging with men, even if they are relatives, as such social interactions are deemed inappropriate for women. The Quran takes a moderate stance on freedom and social engagements, advocating for the "al Washiyya Approach" - a balanced and moderate approach to social interactions within the framework of Islam. Islam does not advocate for the complete seclusion of women within their homes nor does it endorse unrestricted social interactions without any guidelines or restrictions.

Journal Article

Advancements in Binarization and Noise Reduction Techniques for Ancient Script Preservation on Stone, Palm Leaves, and Copper Plates

AYYOOB.MP & P. Muhamed Ilyas

International Journal of Intelligent Systems & Applications in Engineering, Vol. 12(4)



Dr. Muhamed Ilyas



Ayyoob MP

ABSTRACT

This study specifically examines the methods used to protect and improve the condition of ancient texts that are engraved on three different types of materials: stone inscriptions, palm leaves, and copper plates. Every material poses distinct difficulties because of its texture, surface properties, and vulnerability to degradation over time. In order to minimize the negative impacts of noise, various noise reduction techniques such as median filtering, despeckle filtering, and Gaussian smoothing are utilized. Following that, well-established binarization methods such as Otsu, Niblack, and Sauvola are utilized to enhance the binarization process for different types of script materials. The effectiveness of these strategies is assessed using measures such as Mean Square Error (MSE), Structural Similarity Index Measure (SSIM), and Peak Signal-to-Noise Ratio (PSNR). The results indicate that the unique technique surpasses other methods in improving the quality of binarized text on all three types of script materials. This offers great opportunities for preserving and extracting vital textual information from these diverse and historically important mediums.

Journal Article

SegFormer-based Approach for Semantic Segmentation of Necrotic Tissues From Histopathology Images

Saleena T.S , Dr.Muhamed Ilyas Z & Dr.Sajna V. M. Kuttu

IEEE Distributed Computing, VLSI, Electrical Circuits and Robotics ,



Dr. Muhamed Ilyas



Saleens TS

ABSTRACT

The treatment plan assigned to a cancer patient will be decided by various factors and prognostic score is one among them. For Osteosarcoma and Renal Cell Carcinoma, such a decision factor is the amount of tumor necrosis created due to Neoadjuvant Chemotherapy. The main objective of this study is to evaluate the patient body's therapeutic response to Neoadjuvant Chemotherapy by quantifying the tumor necrosis accumulated in the body. The SegFormer model used in this study has efficiently portray the necrotic tissue area from the input histopathology image. It is one of the Transformer-based framework that can be applied for semantic segmentation of images. The encoder side of this model is a Transformer and its decoder side is a Multi-layer Perceptron that causes high performance with lesser computation power. Dice loss has been used to measure the loss and Intersection over Union score for the accuracy. To facilitate this research, a dataset comprising 900 images and their corresponding masks was meticulously curated with the assistance of an experienced pathologist.

Journal Article

A review on speech emotion recognition: a survey, recent advances, challenges, and the influence of noise

Swapna Mol George & Muhamed Ilyas P

Neurocomputing, Volume 568



Dr. Muhamed Ilyas



Swapna Mol

ABSTRACT

Affective Computing systems can detect the emotional state and mindset of an individual. Speech Emotion Recognition (SER) is a unimodal affect computing system based on emotional speech data. It is an active area of research in pattern recognition, computer vision, and deep learning. There is a great deal of literature on SER, but only a few of these works consider how SER performs under noisy conditions. A few surveys exist to review SER, but they either need to cover all aspects of SER in noisy environments or discuss the details thoroughly. In recent years, researchers have had a growing interest in using SER in real-world conditions and have seen improvements in recognition rate. This review compiles the methods and approaches used in noisy SER in the literature up to the mid of 2023. It covers topics such as noisy SER methods, datasets used for SER under noisy conditions, noise used, and toolkits used for noisy SER recognition. Additionally, it focuses on classifiers, features used, and limitations of existing research in noisy SER systems. The review also seeks to answer "Does noise affects performance?" to which the answer is a resounding yes, as demonstrated by the results obtained from this survey.

Journal Article



കേരളത്തിലെ ജാതിവ്യവസ്ഥയും പന്തിഭജനങ്ങളും.

Haskerali EC & Arya K

വിജ്ഞാനകൈരളി, 2024, Sept.



Dr. Haskerali EC

ABSTRACT

The caste system in Kerala caused great discrimination among the people. Food, like many other elements, became part of the concept. Therefore, food gathering has become a political indicator in the revival activities of Kerala. This paper is an investigation into how panthibhajans during the Renaissance were a means of resistance and how successful panthibhajans were in erasing caste concepts. സംഗ്രഹം

കേരളത്തിലെ ജാതി വ്യവസ്ഥ ജനങ്ങൾക്കിടയിൽ വലിയ വിവേചനം സൃഷ്ടിച്ചു. മറ്റു പല ഘടകങ്ങളെയും പോലെ ഭക്ഷണവും ജാതി സങ്കല്പത്തിന്റെ ഭാഗമായിത്തീർന്നു. അതിനാൽ, കേരളത്തിന്റെ നവോത്ഥാന പ്രവർത്തനങ്ങളിൽ ഭക്ഷണ ശേഖരണം ഒരു രാഷ്ട്രീയ സൂചകമായി മാറിയിരിക്കുന്നു. നവോത്ഥാന കാലത്തെ പന്തിഭജനങ്ങൾ എങ്ങനെയാണ് പ്രതിരോധത്തിനുള്ള ഉപാധിയായി രൂപപ്പെട്ടതെന്നും, ജാതി സങ്കല്പങ്ങളെ തുടച്ചുനീക്കുന്നതിൽ പന്തിഭജനങ്ങൾ എത്രത്തോളം വിജയിച്ചുവെന്നും ഈ ലേഖനം അന്വേഷിക്കുന്നു.

Journal Article



TOXICITY PREDICTION OF IMIDAZOLIUM AND PYRIDINIUM IONIC LIQUIDS: A DFT-BASED APPROACH

Abdul Rafoof K.A, M.C Fathima Naja & Muhamed Shahin Thayyil

International Educational Journal of Science and Engineering, Vol.7- 8



Abdul Rafoof KA

ABSTRACT

Ionic liquids (ILs) are defined as salts that melt below 1000C and are typically made up of bulky organic cations paired with inorganic/organic anions. Even though ILs are green solvents due to their unique properties like low volatility, high thermal stability, and recyclability, they will have a certain level of toxicity. This study investigates the structural properties of imidazolium and pyridinium-based ionic liquids and predicts their toxicity using density functional theory (DFT) calculations. The study examines the influence of size, symmetry, and electronegativity of anion and cation on the structural properties and toxicity of ILs. A methodical investigation of ILs is conducted by considering various combinations of cations and anions. Structural features, including the highest occupied molecular orbital, lowest unoccupied molecular orbital, and electronic descriptive parameters, are examined using DFT calculations by Gaussian16. The analysis provides insights into the electronic structure, stability, and reactivity of the ILs, with a particular emphasis on understanding the impact of anion and cation properties. Computational methods are employed to predict toxicity, with a notable observation that toxicity effects are more pronounced when altering the anion component compared to the cation component.

Journal Article



COMPUTATIONAL INVESTIGATION OF IMIDAZOLIUM IONIC LIQUIDS AND THEIR INTERACTIONS WITH CERTAIN BIO-SPECIES USING DENSITY FUNCTIONAL THEORY

Abdul Rafoof K.A & Aseela K K

International Educational Applied Scientific Research Journal - IEASRJ, Vol 9 - 10



Abdul Rafoof KA

ABSTRACT

Ionic liquids, particularly imidazolium-based variants, have gained significant attention due to their unique properties, such as tunable polarity, high thermal stability, and potential applications in electrochemical devices and biosensing. A detailed computational analysis of imidazolium-based ionic liquids (ILs) and their interactions with biologically significant molecules—dopamine, ascorbic acid, and uric acid—was conducted. Using Density Functional Theory (DFT) with the 6-311++G(d,p) basis set, the electronic properties, molecular structures, and interaction energies of three ILs—EMI-SCN, EMI-DCA, and BMI-PF6—were explored. Structural optimization, HOMO-LUMO gap analysis, and molecular electrostatic potential mapping were employed to uncover binding characteristics and reactivity of the ILs toward the biomolecules. Among the tested ILs, EMI-SCN exhibited the highest interaction energies with all analytes, particularly showing strong affinity for ascorbic acid, indicating its potential in electrochemical sensors. The calculated global reactivity descriptors support the stability and reactivity trends, with EMI-SCN demonstrating superior electronic and electrostatic interactions compared to EMI-DCA and BMI-PF6. EMI-SCN's unique interaction profiles suggest its suitability for selective detection of dopamine, ascorbic acid, and uric acid in biological environments. These findings pave the way for the rational design of ionic liquids aimed at enhancing the performance of biosensors and electrochemical devices, offering improved sensitivity and selectivity for biological molecule detection.

Journal Article



Socially Responsible Investment Behaviour of Individual Investors in Kerala

Shabna Mol TP

International Journal of Cultural Studies and Social Science, Vol 20, Issue 1



Dr. Shabna Mol TP

ABSTRACT

With the growing recognition of the importance of sustainable and socially responsible practices in the investment landscape, this study aims to examine the Socially Responsible investment behaviour of individual investors in Kerala. The study highlights the factors influencing individual investors in Kerala to engage in socially responsible investment practices and awareness among individual investors regarding socially responsible investment avenues. Additionally, the research explores analyze the specific SRI strategies employed by individual investors and challenges faced by investors in integrating SRI into their investment portfolios. The present study is both descriptive and analytical based on survey method. Primary data are collected from a sample of 120 investors with the help of a structured questionnaire and secondary data are collected from published articles, journals, reports, books and websites. The study revealed that ESG Investing and Ethical screening are highly aware among the respondents. Highly influenced factor among the respondents is concern for the environment which is higher than the other factors such as clear information about SRI options, social justice and human rights and government incentives or tax benefits. Majority of them are primarily employed strategy is positive screening and negative screening. Major challenges faced by Investors when considering SRI investments are lack of information, concern about financial performance and cultural and social factors.

Journal Article

Study of local piezo and ferroelectric characteristics of PVDF + Bi₂FeO₄ composite nanodots using piezoforce microscopy

M. S. Ravisankar & U. P. Mohammed Rasi

Journal of Materials Science: Materials in Electronics, Vol. 35-312



Dr. M Razi

ABSTRACT

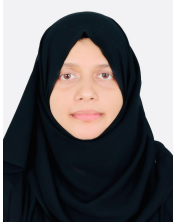
The enhancement of Piezo response and local ferroelectric behavior of PVDF-Bi₂FeO₄ composite thin films are investigated using piezo force microscopy (PFM) technique. The self-assembled composite nanodots thin films are prepared by spin coater with PVDF and Bi₂FeO₄ nano powder solution mixture. The structural and morphology characteristics are analyzed by FTIR-ATR and Atomic force microscopy. The surface microstructure, confined domain structure, its piezo, ferro electricity behavior, its corresponding d₃₃ coefficient are explored with PFM under no poling and poling with external DC bias, AC bias and various drive frequencies. The d₃₃ coefficient varies from 14 to 17 pm/V by adding of 5 wt% of Bi₂FeO₄ to PVDF than pristine PVDF nanodots made under same condition.

Journal Article

Utilizing BiLSTM For Fine-Grained Aspect-Based Travel Recommendations Using Travel Reviews In Low Resourced Language

Muneer V.K, K.P.M Basheer & Rizwana K T

Journal of Electrical Systems, Vol. 20 No. 2s



Dr. Rizwana K. T



Dr. V.K Muneer



Dr. K.P.M Basheer

ABSTRACT

Recommender systems have become an essential tool for enhancing user experiences by providing personalized recommendations. In this study, we present a novel approach to constructing a recommender system specifically tailored for Malayalam travel reviews. Our objective was to extract relevant features from these reviews and employ a bidirectional Long Short-Term Memory (BiLSTM) architecture to construct a robust and accurate recommendation model. We focused on four key features extracted from the travel reviews: travel mode, travel type, location climate, and location type. The travel mode feature encompassed the mode of transport opted for the travel such as bus, car, train, etc., while the travel type captured the nature of the trip, including family, friends, or solo travel. To construct our recommender system, we implemented a BiLSTM architecture, a powerful deep-learning model known for effectively capturing temporal dependencies in sequential data. This architecture allowed us to process the extracted features and learn the underlying patterns within the Malayalam travel reviews. Our experiments were conducted on a comprehensive dataset of Malayalam travel reviews, carefully curated for this study. The performance evaluation of our recommender system yielded promising results. With an accuracy of 83.65 percent, our model showcased its ability to accurately predict and recommend travel options based on the extracted features from the reviews. The high accuracy achieved by our model underscores the effectiveness of the BiLSTM architecture in capturing the nuances of the Malayalam language and understanding the subtle preferences expressed in travel reviews. The use of the Malayalam language in this context expands the reach of recommender systems to a wider audience, catering specifically to individuals who prefer to consume content and make decisions in their native language.

Journal Article

A Stereovision-based Approach for Retrieving Variable Force Feedback in Robotic-Assisted Surgery Using Modified Inception ResNet V2 Networks

P. V. Sabique, Ganesh Pasupathy, S. Kalaimagal, G. Shanmugasundar & V. K. Muneer

Journal of Intelligent & Robotic Systems, May 2024



Dr. V.K Muneer

ABSTRACT

The surge of haptic technology has greatly impacted Robotic-assisted surgery in recent years due to its inspirational advancement in the field. Delivering tactile feedback to the surgeon has a significant role in improving the user experience in RAMIS. This work proposes a Modified inception ResNet network along with dimensionality reduction to regenerate the variable force produced during the surgical intervention. This work collects the relevant dataset from two ex vivo porcine skins and one ex vivo artificial skin for the validation of the results. The proposed framework is used to model both spatial and temporal data collected from the sensors, tissue, manipulators, and surgical tools. The evaluations are based on three distinct datasets with modest variations in tissue properties. The results of the proposed framework show an improvement of force prediction accuracy by 10.81% over RNN, 6.02% over RNN + LSTM, and 3.81% over the CNN + LSTM framework, and torque prediction accuracy by 12.41% over RNN, 5.75% over RNN + LSTM, and 3.75% over CNN + LSTM. The sensitivity study demonstrates that features such as torque (96.93%), deformation (94.02%), position (93.98%), vision (92.12%), stiffness (87.95%), tool diameter (89.24%), rotation (65.10%), and orientation (62.51%) have respective influences on the anticipated force. It was observed that the quality of the predicted force improved by 2.18% when performing feature selection and dimensionality reduction on features collected from tool, manipulator, tissue, and vision data and processing them simultaneously in all four architectures. The method has potential applications for online surgical tasks and surgeon training.

Journal Article

Incorporating Seasonal Trends for River Water Quality Prediction Models Using Deep Learning Algorithms

Jitha P. Nair, Binu Mol T. V., Deepika A., Aparna Unnikrishnan & Muneer V. K.

International Journal of Intelligent Systems & Applications in Engineering, Vol.12-21s



Dr. V.K Muneer

ABSTRACT

In recent years, numerous contaminants have posed significant threats to rivers, streams, and lakes. The ability to analyse and predict water quality has become crucial in combating water pollution. Various seasonal factors, along with physicochemical properties, influence water quality over time. As water quality data forms a time series, the values of parameters fluctuate with changing meteorological conditions across seasons at each location. Consequently, robust time series analysis is essential for accurate water quality forecasting. Given the effectiveness of Recurrent Neural Networks for time sequence data, this study aims to develop a water quality prediction model by learning seasonal patterns in the time series dataset. The dataset comprises 10,560 unique instances that describe both physicochemical and seasonal factors. Predictive models are developed using RNN and its variants, Gated Recurrent Unit and Long Short-Term Memory and evaluated for their performance. The results demonstrate that incorporating seasonal data alongside regular physicochemical properties during model training significantly enhances predictive accuracy. By leveraging the temporal patterns inherent in the dataset, the models achieve promising results, indicating that the inclusion of seasonal variability is beneficial for improving water quality predictions. This approach not only highlights the importance of considering seasonal influences in water quality analysis but also showcases the potential of advanced neural network architectures in environmental monitoring and management. The study underscores the need for comprehensive data collection and sophisticated modelling techniques to effectively anticipate and mitigate the impacts of water contamination.

Journal Article

An Ensembled Travel Recommender Model Using Autoencoder and Machine Learning Algorithms

Muneer V.K

Communications in Computer and Information Science, vol 2268



Dr. V.K Muneer

ABSTRACT

This study investigates the use of autoencoders to analyse travelogues posted in Malayalam on Facebook. The main goal is to use autoencoders to provide a compact representation of the input data, which will be used to train different machine learning models to improve accuracy and efficiency. To address the lack of a standardized dataset in Malayalam for the tourist sector, NLP techniques need to be used to unstructured, long, and uneven travel logs. This is handled by using extra filtering methods and using a specialized POS Tagger in conjunction with lookup dictionaries. The study used a two-step technique. An autoencoder neural network architecture is used to encode the travelogues into a lower-dimensional latent space representation. The encoder's compressed representation is transmitted to the decoder to reconstruct the original travelogues. The encoded model is utilized for training several machine learning models, including MLP, logistic regression, RFC, SVM, KNN, and SGD. The model attains a remarkable validation accuracy of 96.84%.

Book Chapter

Propagation dynamics of hollow Gaussian pulse in photonic crystal fiber

Mir Asma, A K. Shafeeque Ali, Fouad A. Abolaban & A. Sharafali

Journal of Optics,



Dr. Sharafali

ABSTRACT

This paper explores the behavior of a hollow Gaussian pulse (HGP) as it evolves in a nonlinear photonic crystal fiber (PCF). A particular emphasis is given to studying the impact of infiltration of nonlinear liquids and suspension of the fiber core on the evolution of HGPs. We found that the critical power of self-trapping and self-trapping period are higher in conventional silica-core PCF than that of liquid-core PCF. The suspension factor enhances the critical power of self-trapping and self-trapping periods in conventional and liquid core PCFs. When the HGP propagates half of the self-trapping period, it may transform into a focused intensity distribution with a central bright spot. The infiltration of nonlinear liquids and suspension of the fiber core significantly influence this focussed intensity distribution. Compared to the conventional silica PCF in liquid core PCF the pulse compression is high due to enhancement in the nonlinearity, as a result, the HGP evolves to a tightly focussed structure with comparatively high intensity at the center of the pulse. The tight-focussed pulse can be used to trap nanosized particles.

Journal Article



Exploring Kerala's Favorite Getaways: Insights into Traveler Behavior and Preferences

Suhail . P & Muneer VK

South Asian Journal of Management, Vol 31 2



Dr. V.K Muneer



Dr. Suhail P

ABSTRACT

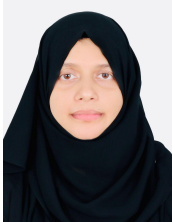
This study examines the travel behavior and preferences of Keralites, aiming to identify the most visited tourist destinations, analyze the travel behavior based on gender and age factors, and report the ratings and rankings of visited destinations. The study employed an online survey method to gather data from travelers across Kerala by leveraging their social media platforms. In the end, the survey obtained a total of 2006 respondents for the study. Based on the statistical analysis conducted for the study, the results indicate that Wayanad, Kashmir, and Munnar are the most popular destinations among Keralite travelers. Gender differences were observed in terms of travel preferences, modes, and partners. Age-based analysis revealed diverse preferences and activities among different age segments. Furthermore, the majority of respondents rated their experiences as "Outstanding," emphasizing the importance of positive destination ratings for tourism marketing and promotion. The implications of these findings include the need for tailored marketing strategies, age-specific tourism products, and continuous monitoring of changing travel preferences. This study contributes to the understanding of Keralites' travel behavior, providing valuable insights for destination management, marketing, and customer experience enhancement in the tourism industry of different states especially Kerala.

Journal Article

Empowering Accented Speech Analysis in Malayalam Through Cutting-Edge Fusion of Self Supervised Learning and Autoencoders

Rizwana K.T & K.P Mohamed Basheer

International Journal of Intelligent Systems and Applications in Engineering, 12(9s)



Dr. Rizwana K.T



Dr. K.P.M Basheer

ABSTRACT

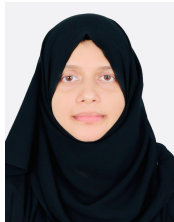
This research explores the application of autoencoders in handling accented speech data for the Malayalam language. The primary objective is to leverage the power of autoencoders to learn a compressed representation of the input data and utilize it to train various machine learning models for improved accuracy rates and reduced word error rates (WER). The study involves a two-step process. Firstly, an autoencoder neural network architecture is employed to encode the accented speech data into a lower-dimensional latent space representation. The encoder network effectively captures the essential features and patterns present in the data. The compressed representation obtained from the encoder is then fed into the decoder, which reconstructs the original input data. In the second step, the encoded model is utilized to train several machine learning models, including logistic regression, decision tree classifier, support vector machine (SVM), random forest classifier (RFC), K-nearest neighbors (KNN), stochastic gradient descent (SGD), and multilayer perceptron (MLP). The encoded features act as inputs to these models, enabling them to learn from the compact representation of the accented speech data. Experimental results indicate that the trained machine learning models, using the encoded features, achieve higher accuracy rates compared to traditional approaches. This improvement in accuracy demonstrates the effectiveness of autoencoders in capturing and representing the significant characteristics of the accented speech data. Moreover, the utilization of the encoded model also leads to lower word error rates, indicating enhanced performance in accurately transcribing and recognizing accented speech in the Malayalam language. This finding showcases the potential of autoencoders in improving the overall accuracy and efficiency of speech-processing tasks for accented languages.

Journal Article

E2E accent-robust ASR for low-resourced Malayalam language: A feature-based investigation of LSTM-RNN and ML approaches

Rizwana K.T, K.P Mohamed Basheer & Muneer V.K

Computing and Communications Networks, Vol 2919 1



Dr. Rizwana K.T



Dr. V.K Muneer



Dr. K.P.M Basheer

ABSTRACT

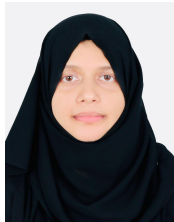
It is well recognized that the Malayalam language is greatly influenced by a wide variety of regional dialects, even though Malayalam speech with each accent is a relatively scarce resource. Therefore, effectively modeling the acoustic variabilities imposed by accents is a crucial task in Malayalam speech recognition. In this study, the implicit and explicit usage of accent information is examined using a variety of machine learning and LSTM-RNN-based acoustic modeling techniques. In this article, methods for multi-accent modeling include multi-accent deep learning models and machine learning models such as Decision Tree Classifier (DTC), Random Forest Classifier (RFC), K Nearest Neighbor (KNN), Support Vector Machine(SVM), Multi-Layer Perceptron(MLP), Stochastic Gradient Descent (SGD), and Long Short Term Memory-Recurrent Neural Network(LSTM-RNN). Here, in this experiment, we have considered the age, gender, and accent features of the audio samples in the speech corpus. We have considered a layered approach for the feature extraction process. The following feature extraction techniques are applied to the speech waves sequentially. Mel Frequency Cepstral Coefficients (MFCC), Short Term Fourier Transform (STFT), Mel Spectrogram Spectral Roll-Off, Root-Mean-Square value of each frame, and the Tempogram Rythm Features are applied to the audio signals for feature engineering. An enhanced ML and LSTM-RNN system that explicitly uses the accent information was proposed that outperformed the baseline accent-independent ASR systems on a low-resource accented Malayalam speech recognition task comprising five regional accents. By encompassing a novel approach in feature extraction for the accented speech and by experimenting with different ML, hybrid, and neural network techniques the authors could propose the best approach with a significant reduction in the WER for the language.

Book Chapter

Parallel convolutional neural network and hybrid architectures for accented speech recognition in Malayalam

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ABSTRACT

This study investigates different approaches to recognizing accented speech for the Malayalam language, a language spoken in the southern region of India. A dataset was constructed for different language accents to conduct the study since there were no freely available datasets in the domain. The data collected has been preprocessed by applying band-pass filters and audio normalization. The speech dataset has been augmented using time-stretching, pitch shifting, and adding Gaussian noise. A total of 585 acoustic features have been extracted from the speech signals using adaptive fast Fourier transform (FFT) window size, spectral contrast, Tonnetz and polyfeatures, harmonic-to-noise ratio (HNR) and formants, zero-crossing rate (ZCR) and short-term Fourier transform, root mean square (RMS) and Mel spectrogram, and Mel-frequency cepstral coefficients (MFCC) and its deltas. Five accented models were constructed using a 2D parallel convolutional neural network (CNN), 4D parallel CNN without attention block, 4D parallel CNN with attention block, Bidirectional long short-term memory, and CNN–long short-term memory hybrid methods. The accented models constructed using 4D Parallel with attention block and hybrid CNN–long short-term memory architecture exhibited better performance with high accuracy and low error rates among all the five model architectures.

Journal Article