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Language Dissemination Paths and Modes Aided by Computer Technology



Abstract: - The expansion of technology and computer science, as well as advancements in language instruction and learning methodologies, has enabled computer-assisted language learning technologies to tackle this challenge. In the field of Chinese learning, a few language learning computerized systems in the country and abroad concentrate mainly on language, grammar acquisition only have one or two assessment indicators as basis of evaluation, that definite functional flaws provide a general assessment to learners' pronunciation. In this manuscript, Language Dissemination Paths and Modes Aided by Computer Technology (LDPM-QICCNN-KOA) are proposed. The input data are collected from Chinese Corpus dataset. Then the data is given into unscented trainable kalman filter for preprocessing the input data. Then the preprocessed data are provided to QICCNN for Language Dissemination. In general, the based Quantum-inspired Complex Convolutional Neural Network doesn't express adapting optimization approaches to determine optimal parameters to ensure exact identification. Hence, KOA utilized to enhance Quantum-inspired Complex Convolutional Neural Network, which accurately done the Language Dissemination Paths and Modes. The proposed LDPM-QICCNN-KOA method is executed on python. Then performance of proposed technique is analyzed with other existing methods. The proposed technique attains 26.36%, 20.69% and 35.29% higher accuracy; 19.23%, 23.56%, and 33.96% higher F1-Score; 26.28%, 31.26%, and 19.66% higher precision when comparing with the existing methods such as research on network oral English teaching system depend on machine learning (LDPM-DBN), nonlinear network speech recognition structure in deep learning algorithm (LDPM-DNN), research on open oral English scoring system depend on neural network (LDPM-BPNN).

Keywords: Kepler Optimization Algorithm, Quantum-inspired Complex Convolutional Neural Network, Chinese Corpus dataset, unscented trainable kalman filter, Language Dissemination Paths and Modes.

I. INTRODUCTION

Languages dispersion channels and modes helped by computing devices relate to the many ways in which computers promote language expansion and interaction [1]. With the growth of electronic the internet, a variety of strategies for promoting language acquisition, comprehension, and usage has arisen [2]. Computer technology has given rise to a variety of digital venues, including instructional programmes, internet pages, and online classrooms [3]. These systems include multimedia content, activities, and educational videos that allow users to learn a new language at their own speed [4]. As Chinese becomes more internationalized, there is a surge in demand for Chinese language education [5]. Standard educational methods cannot satisfy the demands of Chinese learners owing to time and geographical restrictions and a shortage of qualified teachers [6]. China faces significant challenges in educating and learning Chinese due to a variety of factors [7]. Chinese has become a popular subject in school [8]. Computer-Assisted Language Learning (CALL) technology has revolutionized Chinese instruction and learning, addressing this issue [9]. Learners must adapt their methods of instruction to meet the difficulties of rapidly changing knowledge content and tough worldwide competition for highly qualified individuals [10, 11]. To be qualified citizens at 21st century, students should not have comprehensive understanding topic matter, study, and problem-solve, analyse independently, and apply information [12]. For better social improvement, teachers of ideology, politics classes should change spreading techniques, prioritise pupil engagement, motivate deep thinking, and promote deep learning [13, 14]. Real-world resolving issues foster deep learning and practical investigation, which is essential for excellent education in mentality and economics. Good problems encourage deep learning and play a vital role [15, 16]. Most Chinese speakers in Asia still rely on portable devices like language repeaters, MP3 players, and mobile phones to learn Chinese. Still, these approaches are not effective [17]. A transmission pathway is the method or route via which information and technology reach the end user [18]. A route may be seen from two perspectives: as the method by which RNR consumers seek for theoretically useful data, and as the means by which scientists communicate their findings [19].

Traditional classroom education can't satisfy demands of Chinese learners due to time, geographical restrictions and a shortage of qualified teachers for language dissemination.

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People's faces significant challenges in teaching and studying Chinese due to a variety of factors. Due to technological limitations, certain CALL systems, both domestic and international, primarily focus on learning vocabulary and grammar. These motivate us to carry out this research work. The proposed LDPM-QICCNN-KOA method provides a deep learning based Language Dissemination Paths and Modes with high frequency to accomplish the aforementioned goals.

Major contributions of this proposed method are abridged below:

- The Language Dissemination Paths and Modes Aided by Computer Technology (LDPM-QICCNN-KOA) is proposed.
- Develop an Unscented Trainable Kalman Filter for to improve voice signal quality by reducing harmonic distortion, higher frequencies, aliasing caused by human vocal chords, speech signal acquisition from the input data.
- Language dissemination paths and modes has done by QICCNN and is enhanced by KOA for Language Dissemination Paths and Modes.
- The performance matrices likes accuracy, precision, sensitivity, f1-score, RoC.
- The proposed technique is evaluated to existing techniques likes LDPM-DBN, LDPM-DNN, LDPM-BPNN respectively.

The remaining manuscript arranged as below: part 2 presents literature review, part 3 defines proposed method, part 4 shows outcomes, part 5 conclusion.

II. LITERATURE SURVEY

Liu [20] have presented investigation on network oral English teaching system depend on ML. Here, uses the college students' English speech as an investigation object and boosts traditional computerized spoken English quality assessment technique by taking into account exponential assessments searches likes pitch, speed, rhythm, intonation; that was, pitch assessment was depend on frequency central feature parameters and speech speed assessment depend on speech length of time, and melody measurement. The approach of speed, pitch, rhythm, intonation assessment has been empirically proven as trustworthy. It attains higher accuracy, lower RoC.

Meng et al. [21] have presented nonlinear network speech recognition structure in DL process. To investigate the use of nonlinear network identification technology in English learning, assesses English pronunciation quality using an algorithm for DL combined to contents of NN data method, experimental findings of recognizing speech structure were analyzed, discussed in depth. It provides high sensitivity and low f1-score.

Wang [22] have presented investigation on open oral English scoring scheme depend on NN. Here, develops, executes scoring scheme for open-spoken English utilizing NN technology. The method evaluates oral recordings at linguistic, textual levels, allowing it to assess its speech level thoroughly. The scheme will score spoken speech and content independently utilizing numerous methods of assessment, sum the discoveries as end result, with spoken content retrieved via text interpretation of audio by external speech recognition engine. It provides high precision and low RoC.

Chong and Tian [23] have presented a construction with analysis of college Chinese teaching path based multiple network teaching environment with credit system. Here, examines characteristics of interactive teaching mode, identifies issues, difficulties of traditional Chinese instructing, reveals successes, challenges of credit system down change, states that instruction in Chinese mode was feasible, successful teaching method. It attains higher accuracy, lower F1-score.

Li [24] have presented investigation on spread path with evolution causes of oral language in digital era. According to research, in digital media era, voice communication appears single-level feature replicates contemporary engagement along with data transmission. Yet spoken language is a deception created by humans, the interplay between the subject of discourse and the real area of contact creates a psychological distance, yet the scenario is harmonious and inclusive. It provides high RoC and low sensitivity.

Liu [25] have presented a construction with implementation path of college Chinese teaching method in big data environment. Here, examines the existing teaching environment for college Chinese audio-visual courses. Based on current situation, feasible reform plan was suggested to renovate teaching method of college Chinese audio-visual courses, develop teaching quality of college Chinese audio-visual courses, promote an enhancement of students' overall college Chinese ability. It attains higher accuracy, lower precision.

Xue [26] have presented dissemination mode of external intellect of archery culture depend on particle swarm process. The mechanism of external intellect propagation was distinguished. First, particle swarm method was introduced, followed by the distribution of external intelligence. Then, using archery as the study object, it was researched and analysed its distribution efforts, mostly through questionnaires, other techniques, from viewpoints of intellectual differentiation, organizational and mass communication. It provides high F1-score and low RoC.

III. PROPOSED METHODOLOGY

The LDPM-QICCNN-KOA is depicted in this section. Block diagram of LDPM-QICCNN-KOA Language Dissemination System is shown in figure 1. It contains four stages like data acquisition, preprocessing, language dissemination and optimization. Thus the detailed description about LDPM-QICCNN-KOA is given below in figure 1,

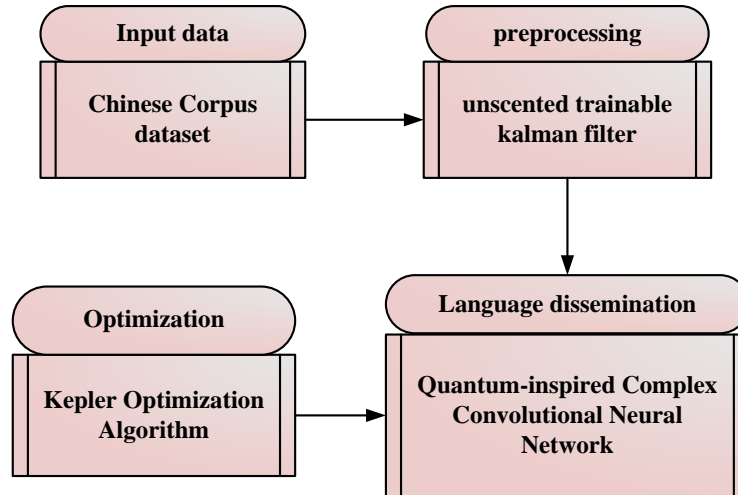


Figure 1: Block diagram for LDPM-QICCNN-KOA model for Language Dissemination Path and Modes

A. Data Acquisition

The input data is gathered from Chinese Corpus dataset [27]. This corpus is around 100 GB and sourced from several websites. We randomly divide data into three sets likes training, development, testing, with ratio of 99:0.5:0.5. The examples span many themes, including news, entertainment, sports, health, foreign politics, movies, celebrities, etc.

B. Pre-processing utilizing Unscented Trainable Kalman Filter

In this step, data pre-processing using UTKF [28] is discussed. The UTKF has aim for to improve voice signal quality by reducing harmonic distortion, higher frequencies, aliasing caused by human vocal chords, speech signal acquisition and modify them to work in the model-based setup. For logistic issues, the Unscented Trainable Kalman Filter method gives a sequential, unbiased, and lowest range of errors estimate based on established system and measurement-related error information. The primary benefit of the Unscented Trainable Kalman filter in oceanic applications is its ability to statistically create flow-dependent loss correlations. To get rid of the model non-linearization, UT, can move variables without altering data’s raw distribution, is used. Sigma points are adopted for the smoothing and uniform processing. The sigma points is expressed in equation (1),

$$\lambda^{(l)}(j+1) = \hat{y}(j+1) \tag{1}$$

Where, λ represents the constant value, j represents the audio and \hat{y} represents the input data. After the generation of sigma points, the sigma point calculation is given in equation (2),

$$g^{(d)}(j+1) = s(\lambda^{(d)}(j+1)), d = 1, \dots, 2m+1 \tag{2}$$

Where, \mathcal{G} represents sigma point prediction, s represents quality of sound measurement, d represents filter, m represents digit label. The data matrix of measurement process is given in equation (3),

$$\sum_q(j+1) = \sum_{d=1}^{2m+1} \omega^{(d)}(\lambda^{(d)}(j+1) - \hat{q}(j+1))(\lambda^{(d)}(j+1) - \hat{q}(j+1))^U + P(j+1) \tag{3}$$

Where, q represents unscented trainable Kalman filter prediction, ϖ represents the numerical value and p represents the signal. The algorithm is demonstrated in the process, the filtering state is obtained according to the proposition $\bar{y}(j+1)$. The optimal Kalman gain is given in equation (4),

$$Z = \sum_{f_q} (j+1) \left[\sum_q (j+1) \right]^{-1} \quad (4)$$

Where, Z represents the optimal Kalman filter and f represents ethnicity. The variance of real and forecast state is necessary parameters to assess error. Error between Kalman filtering states given in equation (5),

$$g(j+1) = f(j+1) - \bar{f}_k(j+1) \quad (5)$$

Where, g represents binary representation of Z , \bar{f}_k represents the digit covariance matrix. The variance among the true state, the assessed state must be reduced in order to remove the residual in measurement and prediction. The partial derivative is given in equation (6),

$$\frac{\varphi \left[av \left(\sum_f (j+1) \right) \right]}{\varphi Z} = 2Z \sum_q (j+1) - 2 \sum_{f_q} (j+1) \quad (6)$$

Where, φ represents vector time and $a \& v$ represents the predicted value of covariance matrix in the Chinese Corpus data. Finally, the data is smoothed and has been uniformed by using the Unscented Trainable Kalman Filter. Then the pre-processed data is fed to Language Dissemination phase.

C. Language Dissemination Paths and Modes using Quantum-inspired Complex Convolutional Neural Network

In this section, the Language Dissemination Paths and Modes using Quantum-inspired Complex Convolutional Neural Network [29] are discussed. This network means and actions used to share or distribute a language. This encompasses how a language is taught, learnt, used, and shared by people and groups. The method may take many forms, including official education, casual contacts, technology, media, and customs of culture. QC-CNNs have been found to have superior generalization skills than traditional CNNs. This is because complex-valued representations allow for greater regularization, and complex-valued convergence essentially needs geographical gravity sharing, which aids in the prevention of excessive fitting. To create QICNNs, use better quantum-inspired neurons in fully linked layers, quantum-inspired convolutional training convolutional layer. Using these approaches at various levels of convolutional, fully connected layers significantly improves efficiency of networks. The input matrix has been rescaled and input layer is given in equation (7),

$$y_{input} = \frac{\Re}{2} y_{data} \quad (7)$$

Where, y_{input} represents the preprocessed data, \Re represents the weight parameter, y_{data} represents the linear value. Multilayer employs quantum-inspired convolutional process. The actual, fictitious components of convolutional kernel matrix are attained as given in equation (8),

$$y_{real} = \cos(y_{input}), y_{lang} \quad (8)$$

Where, y_{real} represents the real languages, y_{input} represents the preprocessed data, y_{lang} represents the language taken from the dataset. QCCNN enables the investigation of innovative dissemination mechanisms inspired by quantum computation. These techniques may entail using quantum features like as entanglement, superposition, and quantum teleportation to securely and efficiently convey language data. The convolutional matrices is same for the bias term and the object is performed as given in equation (9),

$$x_{b1_real} = conv(y_{real}, t_{real}) - conv(y_{lang}, v_{lang}) - p_{real} \quad (9)$$

Where, x_{b1_real} represents the bias term of language moving paths, t_{real} represents the number of words, v_{lang} represents the selected language, p_{real} represents the paths of language. Complicated weighted connections have more encoding power and variability. Using complicated loads can boost quantum-inspired neuron performance. It is given in equation (10),

$$w_2 = g(\infty), \tag{10}$$

Where, w_2 represents the communication, and $g(\infty)$ represents the proficiency of language. Calculate argument of complex number. The numerical tests show that fully linked networks by complex-valued weights outperform those with real weights. It will use the upgraded quantum-inspired neuron to build convolutional neural networks. It is given in equation (11),

$$\infty = \frac{\Re}{2} - \arg(\sum) \tag{11}$$

Where, ∞ represents the, \Re represents the target audience, and $\arg(\sum)$ represents the argument matrices. The information provided is converted into a complicated space with phase values within the range. The result from the third Collaboration process is given in equation (12),

$$c_1 = r(v_1)x_{input} - r(p_1) \tag{12}$$

Where, represents the c_1 path determination, v_1 represents the parameter of weight matrices, $r(v_1)$ represents the cultural context, $r(p_1)$ represents the first set of words, and x_{input} represents the input value of language dissemination path and modes. The financial status of a neighbourhood can influence the availability and accessibility of various language distribution methods. Communities with strong internet penetration, literacy rates, and access to technology may use online platforms for language distribution, whilst others may rely on traditional methods such as television or social gatherings. The final result of language dissemination paths and modes is given in equation (13),

$$c_2 = r(v_1)x_{output} - r(p_2) \tag{13}$$

Where, $r(p_2)$ represents pronunciation of second set of words, x_{output} represent the output value of the language dissemination path and modes. Finally, the using Quantum-inspired Complex Convolutional Neural Network for the Language Dissemination Paths and Modes has been done. Due to its convenience, pertinence, AI-depend optimization approach is taken to account in QICCNN classifier. The KOA is employed to enhance QICCNN optimum parameter $r(v_1)$ and \Re . The KOA is employed for tuning weight with bias parameter of QICCNN.

D. Optimization utilizing Kepler Optimization Algorithm (KOA)

The weight parameter $r(v_1)$ and \Re of QICCNN is enhanced using the KOA [30] is discussed. The KOA, based on Kepler's laws of planetary motion, presented as a novel approach for solving optimisation issues. KOA, like other metaheuristic algorithms, relies on prospecting and mining as its core managers. The planet's separation from the sun determines the mission's operator, though its proximity to the sun determines the other operator.

1) Stepwise Process OF KOA

Here, stepwise process is defines to get ideal value of QICCNN depend on KOA. Initially, KOA makes equally distributing populace to enhance parameter of QICCNN. Best solution is promoted using KOA, related flowchart is illustrated in Figure 2.

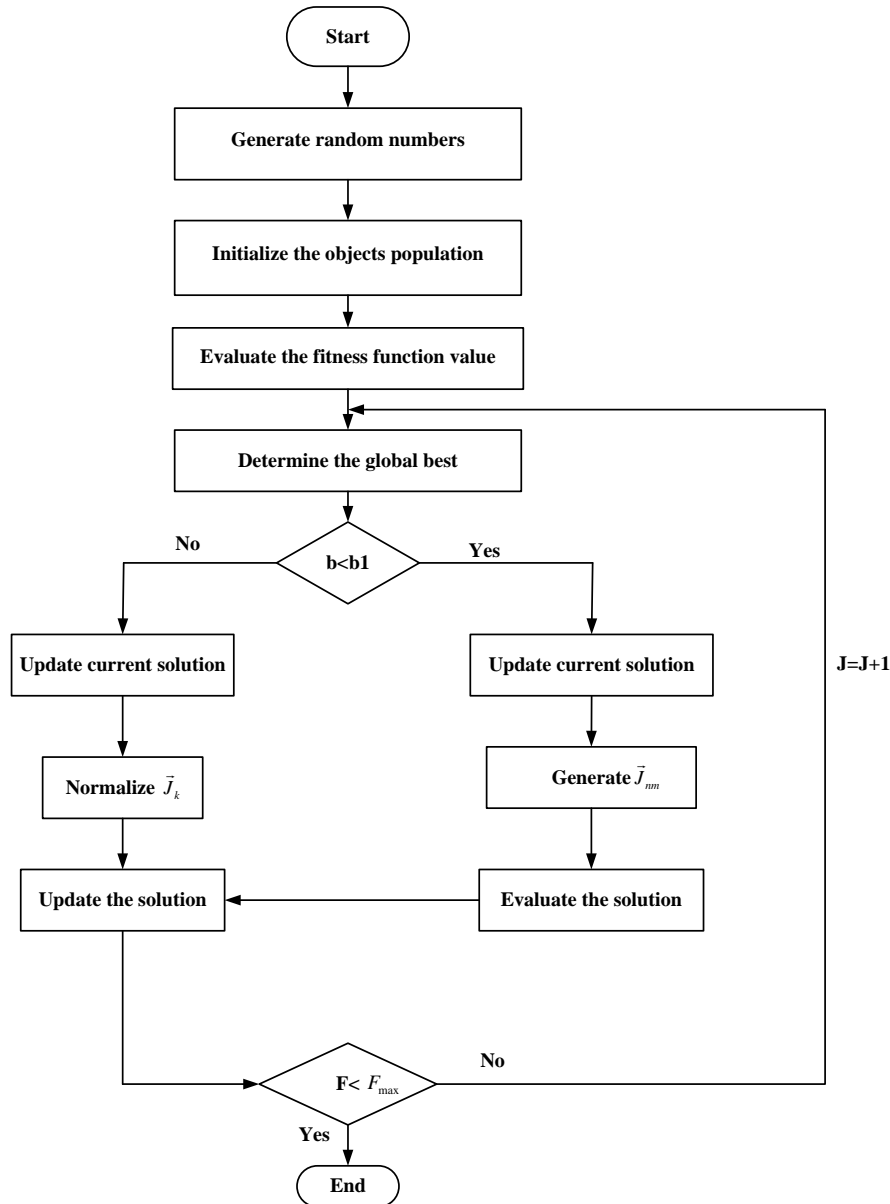


Figure 2: Flowchart of KOA for optimizing -QICCNN parameter

Step 1: Initialization

The matrix of dimensions is randomly initialized inside lower, upper boundaries of every dimension using formula is given in equation (14),

$$\vec{J}_k = \vec{J}_{gh} + \vec{b} \times (\vec{J}_{nm} - \vec{J}_{gh}) \tag{14}$$

Where, \vec{J}_k represents the k^{th} solution, \vec{J}_{nm} represents the upper bound vector, \vec{J}_{gh} represents the lower bound vector, and \vec{b} represents the numerical values.

Step 2: Random Generation

Input parameters produced at randomly. Ideal fitness values were selected based on explicit hyper parameter condition.

Step 3: Fitness function estimation

A random solution is created utilizing initialized assessments. Utilizing parameter optimization value, fitness function is assessed for optimizing weight parameter $r(v_1)$ and \mathfrak{R} of the biometric authentication. It is given in equation (15),

$$Fitness\ function = optimizing(r(v_1) \& \mathfrak{R}) \tag{15}$$

Step 4: Defining gravitational force

KOA uses universal equation of gravity to calculate gravitational pull of Sun \vec{J}_c on all planet \vec{J}_k . It is given in equation (16),

$$T_{dk}(f) = q_k \times \phi(f) \times \frac{\vec{D}_c \times \vec{d}_k}{\vec{W}_k^2 + \eta} + b_1 \quad (16)$$

Where, η represents tiny number, $\vec{D}_c, \vec{d}_k, \vec{W}_k$ are represents the normalized values. The numerical value at random is computed as given in equation (17),

$$v(f) = v_0 \times \exp\left(-\phi \frac{f}{F_{\max}}\right) \quad (17)$$

Where, ϕ is the constant value, represents the initial value, F_{\max} and f indicates the maximum function evaluation.

Step 5: Calculating object's velocity

The separation between planet and Sun dictates how fast it moves. Planet's speed increases methods, diminishes as it moves away from Sun. As planets, other objects approach the Sun, they speed to escape being sucked in by its greater gravity. KOA calculates each planet's velocity based on its distance from the Sun as given in equation (18),

$$v = (b_3(1 - b_4) + b_4) \quad (18)$$

Where, represents the velocity, b_3 & b_4 represents the two numerical values.

Step 6: Escaping from local optimum

The bulk planets in solar system orbit in an in the opposite direction orientation, but few rotate anticlockwise. Fact is mimicked KOA to improve investigation possibilities and prevent local minima. It is given in equation (19),

$$\phi = (b_3 \times (1 - b_5) + b_5) \quad (19)$$

Where, ϕ represents local minima, and b_3 & b_5 represents the two numerical values.

Step 7: Updating object's position

After determining every planet's velocity, its new location may be calculated using the following algebraic formula is expressed in equation (20),

$$\vec{J}_k(f+1) = \vec{J}_{k(f)} + \phi \times \vec{W}_{k(f)} + (T_{c_k}(f) + |b|) \times \vec{Y} \times (\vec{J}_c - \vec{J}_{k(f)}) \quad (20)$$

Step 8: Updating distance with Sun

The KOA aims to strengthen its exploration and exploitation capabilities by mimicking natural changes in separation between Sun, planets over time. KOA prioritizes exploitation for planets close to the Sun, while exploring for planets further away. The mathematical model is given in equation (21),

$$\ell = (s_2 - 1) \times b_4 + 1 \quad (21)$$

Where, ℓ represents the normal distribution, and s_2 represents cyclic controlling parameter.

Step 9: Elitism

It implements elitist technique to ensure Sun and planets remain at optimal localized places, as specified by the mathematical formula is given in equation (22),

$$\vec{J}_{k,new}(f+1) = \begin{cases} \vec{J}_k(f+1), & \text{if } t(\vec{J}_k(f+1) \leq t(\vec{J}_k(f))) \\ \vec{J}_k(f) \end{cases} \quad (22)$$

Where, $\vec{J}_{k,new}$ represents the new position of the planet.

Step 10: Termination Condition

With the aid of KOA, the weight parameter value $r(v_1)$ and \mathfrak{R} from the Quantum-inspired Complex Convolutional Neural Network are optimized using KOA, iteratively repeat step 3 until fulfill halting criteria $J = J + 1$. The LDPM-QICCNN-KOA method effectively for Language Dissemination Paths and Modes with high accuracy and higher frequency.

IV. RESULT AND DISCUSSION

In this part, experimental results of the indicated procedures are deliberated. The ARM cortex A53 (Broadcom BCM2387) quad-core processor by 64-bit CPU operating by 1.2 GHz speed, 1 GB of RAM is included in its main specifications. The proposed LDPM-QICCNN-KOA method is applied by using python based stated performance metrics. The attained result of proposed is analyzed with existing techniques likes LDPM-DBN, LDPM-DNN, and LDPM-BPNN respectively.

A. Performance measures

Accuracy, sensitivity, Precision, F1-score, RoC performance metrics are used to describe the performance of proposed strategy.

- TP: Number of positive Language dissemination paths and modes correctly done as positive.
- TN: Number of negative Language dissemination paths and modes correctly done as negative.
- FP: Number of negative Language dissemination paths and modes incorrectly done as positive.
- FN: Number of positive Language dissemination paths and modes incorrectly done as negative.

1) Accuracy

It is ratio of number of exact authentication with total forecasts made for dataset. It is scaled in equation (23)

$$Accuracy = \frac{(TP + TN)}{(TP + FP + TN + FN)} \quad (23)$$

2) Precision

It is a metric that quantifies the number of correct positive forecast made. It is shown in equation (24),

$$precision = \frac{TP}{(TP + FP)} \quad (24)$$

3) Sensitivity

Sensitivity is metrics which computes forecasts made by correct number of positive predictions made by total positive forecasts. It is given in equation (25),

$$Sensitivity = \frac{TP}{TP + TN} \quad (25)$$

4) F1-score

It combines precision and recall into single value, provided that balance among these dual important metrics. It is computed in eqn (26),

$$F1Score = \frac{TP}{\left(TP + \frac{1}{2} [FP + FN] \right)} \quad (26)$$

5) RoC

An integrated measurement of measurably phenomena is RoC and is given in equation (27),

$$RoC = 0.5 \times \frac{TN}{FP + TN} + \frac{TP}{FN + TP} \quad (27)$$

B. Performance analysis

Figure 3 to 7 portrays stimulation outcomes of LDPM-QICCNN-KOA method. Then, the proposed LDPM-QICCNN-KOA technique is analyzed with existing techniques likes LDPM-DBN, LDPM-DNN and LDPM-BPNN respectively.

Figure 3 shows Accuracy analysis. Here, LDPM-QICCNN-KOA attains 26.36%, 20.69% and 35.29% higher accuracy analyzed with existing as LDPM-DBN, LDPM-DNN, and LDPM-BPNN respectively.

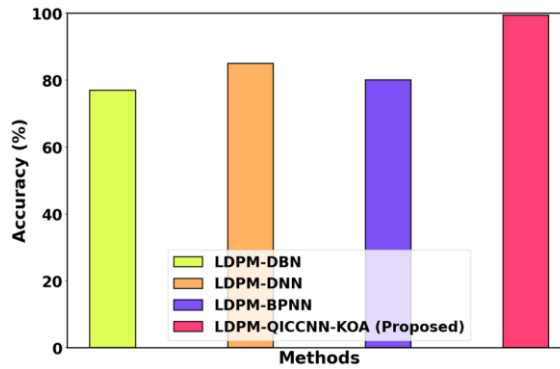


Figure 3: Accuracy analysis

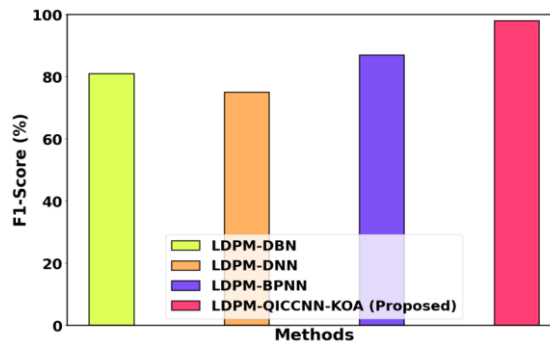


Figure 4: F1-score analysis

Figure 4 shows F1-Score analysis. Here, LDPM-QICCNN-KOA attains 19.23%, 23.56%, and 33.96% higher F1-score analyzed with existing as LDPM-DBN, LDPM-DNN, and LDPM-BPNN respectively.

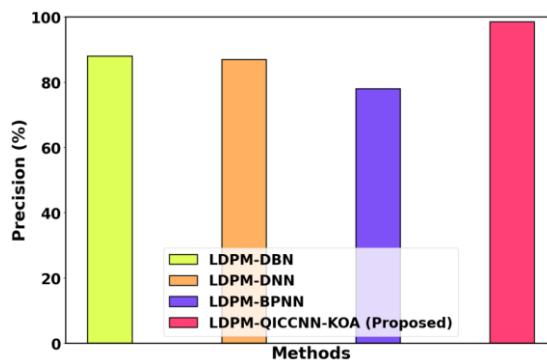


Figure 5: Precision analysis

Figure 5 displays precision analysis. Here, LDPM-QICCNN-KOA attains 26.28%, 31.26%, and 19.66% higher precision analyzed with existing as LDPM-DBN, LDPM-DNN, and LDPM-BPNN respectively.

Figure 6 shows sensitivity analysis. Here, LDPM-QICCNN-KOA attains 28.96%, 33.21% and 23.89% higher sensitivity analyzed with existing as LDPM-DBN, LDPM-DNN, and LDPM-BPNN respectively.

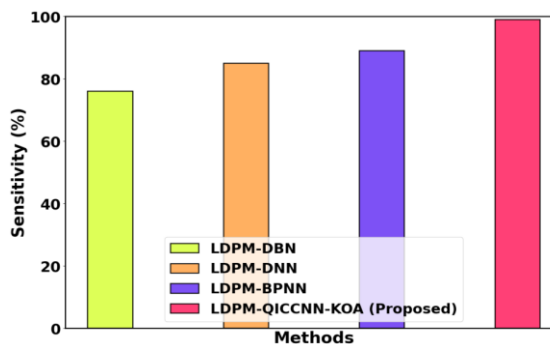


Figure 6: Sensitivity analysis

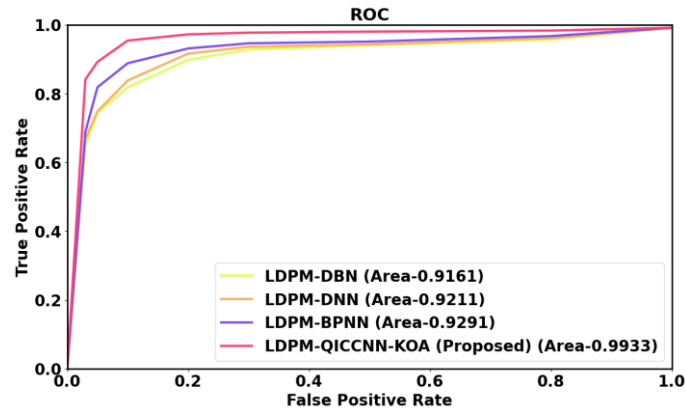


Figure 7: RoC analysis

Figure 7 shows RoC analysis. Here, LDPM-QICCNN-KOA attains 34.58%, 22.36%, and 20.36% higher RoC analyzed with existing as LDPM-DBN, LDPM-DNN, and LDPM-BPNN respectively.

C. Discussion

In this work, LDPM-QICCNN-KOA model for the Language Dissemination Paths and Modes discussed. Manual scoring remains the primary method for evaluating language proficiency in Chinese speaking tests, leading to inconsistent standards, sluggish pace, and weak consistency and durability. To investigate these issues, it uses Chinese speech as research object. We develop traditional computerized Chinese pronunciation quality assessment technique by incorporating multi-covariate assessment indexes like speed, pitch, rhythm, intonation. The estimation of variance table shows a significant regression equation and a linear correlation between the score, accuracy, speed, rhythm, and intonation scores. The potential of error in determining the impact of these four evaluation indexes on the total score is only 0.003. The empirical evaluation of proposed LDPM-QICCNN-KOA method is highlighted through a range of evaluation metrics likes accuracy, sensitivity, precision, F1-score, RoC. Presenting a comparison of 99.2% accuracy achieved by the proposed technique to that of LDPM-DBN, LDPM-DNN, LDPM-BPNN. It concludes that the proposed LDPM-QICCNN-KOA method is better than existing models for Language Dissemination Paths and Modes.

V. CONCLUSION

In this manuscript, Language Dissemination Paths and Modes Aided by Computer Technology (LDPM-QICCNN-KOA) is successfully implemented. Thorough experiments and assessments revealed that the suggested model outperformed current techniques regards precision, overall accuracy. The performance of LDPM-QICCNN-KOA method approach contains 28.96%, 33.21% and 23.89% higher sensitivity; 34.58%, 22.36%, and 20.36% higher RoC when analyzed to the existing methods such as LDPM-DBN, LDPM-DNN, and LDPM-BPNN respectively.

REFERENCE

- [1] Pérez-Llantada, C., 2021. Genres and languages in science communication: The multiple dimensions of the science-policy interface. *Language & Communication*, 78, pp.65-76.
- [2] Ahmad, S.S., Rani, R., Wattar, I., Sharma, M., Sharma, S., Nair, R. and Tiwari, B., 2023. Hybrid recommender system for mental illness detection in social media using deep learning techniques. *Computational Intelligence and Neuroscience*, 2023.
- [3] Jia, Z., 2022. Analysis Methods for the Planning and Dissemination Mode of Radio and Television Assisted by Artificial Intelligence Technology. *Mathematical Problems in Engineering*, 2022.
- [4] Wang, Z., Li, G., Zhuo, Z., Ren, X., Lin, Y. and Gu, J., 2022. A deep learning method for android application classification using semantic features. *Security and Communication Networks*, 2022.
- [5] Jayatilake, S.M.D.A.C. and Ganegoda, G.U., 2021. Involvement of machine learning tools in healthcare decision making. *Journal of healthcare engineering*, 2021.
- [6] Yang, X., Zou, Y., Tang, J., Liang, J. and Ijaz, M., 2020. Evaluation of short-term freeway speed prediction based on periodic analysis using statistical models and machine learning models. *Journal of Advanced Transportation*, 2020.
- [7] Hong, N., 2022. Digital-media-based interaction and dissemination of traditional culture integrating using social media data analytics. *Computational Intelligence and Neuroscience*, 2022.

- [8] Li, J., Zhang, R., Jin, Y. and Zhang, H., 2022. Optimal Path of Internet of Things Service in Supply Chain Management Based on Machine Learning Algorithms. *Computational Intelligence and Neuroscience*, 2022.
- [9] Lu, H., 2022. Design of ideological and political communication path of curriculum under the background of intelligent information of new media. *Mobile Information Systems*, 2022.
- [10] Chen, X., 2022. Internet plus innovation and entrepreneurship education model based on machine learning algorithms. *Mobile Information Systems*, 2022.
- [11] Veeramakali, T., Shobanadevi, A., Nayak, N.R., Kumar, S., Singhal, S. and Subramanian, M., 2022. Preserving the Privacy of Healthcare Data over Social Networks Using Machine Learning. *Computational Intelligence and Neuroscience*, 2022.
- [12] Zhao, D., 2022. Systematic Mode Construction of Mixed Teaching from the Perspective of Deep Learning. *Mathematical Problems in Engineering*, 2022.
- [13] Huang, L., 2022. Application research of manuscript writing robot based upon laser sensor in news dissemination field. *Wireless Communications and Mobile Computing*, 2022.
- [14] Xu, X., Zou, G., Chen, L. and Zhou, T., 2022. Metaverse space ecological scene design based on multimedia digital technology. *Mobile Information Systems*, 2022.
- [15] Lu, X., Yang, Y., Wang, L. and Wang, H., 2022. Cultural and Creative Design of Dunhuang Murals in Xixia Period Based on Deep Learning. *Wireless Communications and Mobile Computing*, 2022.
- [16] Luo, D., 2022. Research on the implementation path of ideological and political education in private colleges and universities under the network environment. *Journal of Environmental and Public Health*, 2022.
- [17] Sun, J., 2022. Contemporary Value Assessment of Marxist Ideology under the Context of Deep Learning. *Computational and Mathematical Methods in Medicine*, 2022.
- [18] Shi, P., 2022. Research on the Strategy of Autonomous Learning under the Dual-Class Model of Ideological and Political Courses Based on the Knowledge Map Route. *Wireless Communications and Mobile Computing*, 2022.
- [19] Zhang, H., 2021. Voice keyword retrieval method using attention mechanism and multimodal information fusion. *Scientific Programming*, 2021, pp.1-11.
- [20] Liu, X., 2022. Research on Network Oral English Teaching System Based on Machine Learning. *Security and Communication Networks*, 2022.
- [21] Meng, L., Kuppuswamy, P., Upadhyay, J., Kumar, S., Athawale, S.V. and Shah, M.A., 2022. Nonlinear network speech recognition structure in a deep learning algorithm. *Computational Intelligence and Neuroscience*, 2022.
- [22] Wang, X., 2022. Research on Open Oral English Scoring System Based on Neural Network. *Computational Intelligence and Neuroscience*, 2022.
- [23] Chong, B. and Tian, Z., 2022. Construction and Analysis of College English Teaching Path under the Multiple Network Teaching Environment and Credit System. *Journal of Environmental and Public Health*, 2022.
- [24] Li, Z., 2022. Research on the spread path and evolution causes of oral language in the digital era. *Journal of Mathematics*, 2022, pp.1-9.
- [25] Liu, X., 2022. Construction and Implementation Path of College English Teaching Mode in Big Data Environment. *Mathematical Problems in Engineering*, 2022.
- [26] Xue, Y., 2022. The Dissemination Mode of External Intelligence of Archery Culture Based on the Particle Swarm Algorithm. *Wireless Communications and Mobile Computing*, 2022.
- [27] <https://www.kaggle.com/datasets/allanyinai/chinesecorpus/data>
- [28] Yu, Y., Li, Q. and Zhang, H., 2023. Unscented Trainable Kalman Filter Based on Deep Learning Method Considering Incomplete Information. *IEEE Access*.
- [29] Shi, S., Wang, Z., Cui, G., Wang, S., Shang, R., Li, W., Wei, Z. and Gu, Y., 2022. Quantum-inspired complex convolutional neural networks. *Applied Intelligence*, 52(15), pp.17912-17921.
- [30] Abdel-Basset, M., Mohamed, R., Hezam, I.M., Sallam, K.M., Alshamrani, A.M. and Hameed, I.A., 2023. A novel binary Kepler optimization algorithm for 0–1 knapsack problems: Methods and applications. *Alexandria Engineering Journal*, 82, pp.358-376.