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CPRP-CNN: A DEEP LEARNING FRAMEWORK FOR SHORT VIDEO POPULARITY PREDICTION USING IOT DATA

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ABSTRACT
Using deep learning regression models and the Internet of Things (IoT), this study looks at methods for predicting the popularity of short videos in order to provide useful insights and solutions that can be applied to content creators, social media platforms, academic research, and everyday users. In the context of cross-cultural communication, a proposed Convolutional Neural Network (CPRP-CNN) model-based Content Popularity Rank Prediction solely depends on the publisher's personal attributes and the textual features of short videos to predict the viewership levels of short videos shortly after they are released. The model's performance is evaluated by simulated tests, which show that using the Rectified Linear Unit (Relu) activation function in the CPRP-CNN model improves accuracy by 42.2% in comparison to using the sigmoid function. Alongside this improvement, cross-entropy loss is decreased by 37.8%. Additionally, compared to other prediction models, the suggested CPRP-CNN model achieves a cross-entropy of 0.692 and an accuracy of 74.7%, with better Mean Squared Error (MSE) and Mean Absolute Error (MAE) values of 2.728 and 1.751, respectively. These results indicate that combining deep learning models with fused features in an Internet of Things setting greatly improves the popularity prediction accuracy of short videos. The results of the study help to improve suggestions for accurate and tailored short video material.

I. INTRODUCTION

A. RESEARCH BACKGROUND AND MOTIVATIONS

Short videos have been increasingly popular worldwide in recent years, driven by apps like TikTok, Instagram, and Snapchat. With billions of users, these platforms have become the main social media channels, especially for younger people, especially Generation Z [1], [2], and [3]. These short video applications not only provide a simple and entertaining way to share bits of life and create content, but they also foster a new social culture that makes user contact and communication easier on a worldwide basis. However, a number of elements, such as user interests, content quality, social network impacts, geographic location, and others, affect the popularity and communication dynamics of short films. Accurately forecasting the popularity of short videos is extremely difficult due to the complex interactions between these elements [4, 5, 6]. Traditional methods sometimes rely on simple indicators such as user reviews, views, or likes; however, these measurements are not sufficient to capture the complexities of brief video conversation.

Research on a regression model that combines deep learning and the Internet of Things (IoT) becomes essential in this situation [7], [8]. IoT technology makes it possible to gather extensive and detailed data, including environmental details like location, device kind, and network connection quality, as customers watch brief videos. With this extra data, the user context is better understood, which results in more accurate short video popularity estimates [9], [10], and [11]. At the same time, deep learning regression models have strong data modelling skills, managing high-dimensional, large-scale data and

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identifying complex patterns and correlations. [12], [13], and [14]. By combining deep learning regression models with IoT data, it is easier to create a prediction model that is more accurate and provides insight into the elements that influence the propagation of short videos [15], [16], and [17]. However, there are several difficulties in handling the enormous amounts of complicated and varied data produced by the Internet of Things. It takes sophisticated methods to analyse, analyse, and extract useful information from such data in an efficient manner. Furthermore, the performance of prediction models may be negatively impacted by data noise and uncertainty. Compatibility and standardisation problems are brought on by the IoT's heterogeneous device environment, which makes smooth connection and data-sharing solutions essential. This is a major obstacle in predicting the popularity of short videos on the IoT.

The significant financial benefit of correctly forecasting the popularity of short videos for content producers and social media platforms is what spurred this study. Strategic content planning, which draws in more viewers and advertisers and eventually boosts income, is made possible by predicting which videos are most likely to become popular. Additionally, knowing how user behaviour varies by geography and culture makes it easier to offer tailored content, which raises user happiness. By revealing the potential uses of IoT technology and deep learning in cross-cultural communication research, this field of study advances our understanding of how information is disseminated and how social interactions differ and are similar across cultural backgrounds.

B. RESEARCH OBJECTIVE

This study's main goal is to outline a strategy for forecasting short films' level of popularity in the context of cross-cultural communication. To provide useful insights and solutions for content creators, social media platforms, academic research, and the larger user community, this project aims to combine the Internet of Things (IoT) with a deep learning regression model.

The study elaborates on the context, goals, and urgent nature of the research in Section I. A thorough analysis of the current research environment covering deep learning regression models, Internet of Things-related technologies, and approaches relevant to forecasting the popularity of short videos is given in Section II. In Section III, a short video popularity prediction model based on the deep learning regression paradigm is introduced, led by the framework of cross-cultural communication and utilising the IoT background. A multi-modal feature fusion supervision method is used in this model. Examining and confirming the efficacy of the suggested prediction model is the focus of Section IV. Lastly, Section Ven summarises the study's findings, points out its shortcomings, and suggests possible directions for further investigation.

II. LITERATURE SURVEY

"A systematic review of Internet of Things technologies and machine learning techniques for Parkinson's disease diagnosis, monitoring, and management,"

I. Roussaki, K.-M. Giannakopoulou, and K. Demestichas,

Many people, particularly the elderly, suffer from Parkinson's disease, a chronic neurological illness. It causes motor, cognitive, and other symptoms, which drastically lowers the patient's quality of life. At every stage of the disease, Parkinson's patients, their carers, and clinicians can benefit from the latest developments in the fields of artificial intelligence and the Internet of Things, including the subdomains of machine learning and deep learning. This will maximise treatment efficacy and minimise associated healthcare costs. In order to give predictions or estimations regarding elements of Parkinson's disease, the reviewed papers provide machine learning models that have been trained on data obtained from wearable or non-wearable sensors, smart devices, and other Internet of Things technologies. A total of 770 papers have been obtained from three

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major databases of scholarly literature. Finally, in the state-of-the-art systematic review described in this study, 121 of them were systematically chosen and taken into consideration. These research offer a variety of approaches that are used on a range of sensory data to solve various issues linked to Parkinson's disease. The best-performing algorithms, the most often encountered issues, and the most extensively used sensors are emphasised. A summary of the difficulties is provided at the end, along with some thoughts for the future and emerging potential.

"Self-aware and adaptable proactive caching in IoTMEC networks through the use of LSTM and ensemble learning,"

N.-N. Dao, V. Dat Tuong, W. Noh, S. Cho, and T.-V. Nguyen

Edge content caching for mobile/multi-access edge computing (MEC) has been identified as a promising approach to improve the quality of services in terms of latency and energy consumption in order to meet the demanding requirements of emerging IoT applications like virtual reality, smart homes, and smart cities in 5G/6G Internet-of-things (IoT) networks. However, it is challenging to create a standard caching architecture that works well and accommodates a range of user preferences due to cache capacity restrictions. In this research, we offer a novel content caching technique that uses flexible prediction in constantly changing user and network settings to maximise the cache hit ratio. Long short-term memory (LSTM)-based local learning and ensemble-based meta-learning form the foundation of this hierarchical deep learning architecture. First, we use an LSTM technique with seasonal-trend decomposition employing preprocessing based on loess (STL) as a local learning model. It determines the characteristics needed to forecast content demand across different user demographics. Second, we deploy a regression-based ensemble learning approach as a meta-learning model. This approach has sublinear "regret" performance and makes use of an online convex optimisation framework. In real time, it integrates the user preferences from several demographics into a single caching technique. The well-known MovieLens datasets were used for extensive testing. It was demonstrated that the suggested control offers a cache hit ratio that is up to 30% higher than that of traditional representative algorithms and that is almost optimal, falling within 9% of the ideal caching method with perfect prior knowledge of content popularity. The network data analytic function (NWDAF) module of the 5G/6G standard can incorporate the suggested learning and caching control as a fundamental feature.

"Medical data processing using machine learning techniques based on distributed computing and the Internet of Things,"

M. Darbandi, N. J. Navimipour, M. Rezaei, S. Talebi, P. Azad, M. Unal, S. Aminizadeh, A. Heidari, S. Toumaj, and M.

With the major objective of preserving patient data through new information technologies, such as the Internet of Things (IoT) and sensor technologies, which produce patient indexes in hospital data networks, medical data processing has been a hot issue in recent decades. In the healthcare age, innovations such as distributed computing, wearables, chatbots, blockchain, machine learning (ML), and pattern recognition can effectively facilitate the gathering and processing of medical data for decision-making. Distributed computing is very useful for helping professionals with the illness detection process since it can quickly evaluate large amounts of data and generate intelligent, personalised recommendations. Conversely, the world is currently dealing with a COVID-19 outbreak, and reducing the death rate requires an early detection method. Radiologists can examine the astounding volume of medical pictures with the help of machine learning algorithms. However, in order to process them, a vast amount of training data must be combined. As a result, creating Deep Learning (DL) involves a number of challenges,

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including standard data collecting, quality control, information sharing, privacy protection, legal requirements, and moral concerns. Our goal in this study is to present a comprehensive review of the latest research on distributed computing platform applications using five different platform categories: cloud computing, edge, fog, IoT, and hybrid platforms. Therefore, we assessed 27 papers on the use of the suggested framework, implemented techniques, and applications, highlighting the benefits and limitations as well as the dataset that was used. We also checked for the use of the Transfer Learning (TL) approach and security measures. Consequently, it was demonstrated that the majority of studies (about 46%) were conducted in 2021 and that the majority of current research (almost 43%) employed the IoT platform as the setting for the suggested design. Furthermore, with a 19.4% usage rate, the Convolutional Neural Network (CNN) was the most often used DL method. Therefore, the main goal of departments related to healthcare is to provide patients with proper therapy, regardless of how technology advances. In order to properly assess the current healthcare data analysis methods and create more functional architectures based on distributed environments and DL, additional research is advised.

"Data mining powered by the Internet of Things for intelligent crop production forecasting in the peasant farming sector,"

R. Valencia-García, M. D. P. Salas-Zárate, M. A. Paredes-Valverde, and L. O. Colombo-Mendoza,

Artificial neural networks and machine learning techniques are highly advantageous for data mining in Internet of Things (IoT) technologies, and vice versa. This convergence in the agricultural sector may lead to the creation of intelligent farming systems that peasant farmers may utilise to assist in making decisions. The architecture of a smart farming system for crop production is presented in this paper. It is based on widely used cloud data storage and analytics services, as well as inexpensive IoT sensors. Furthermore, a novel data-mining technique is suggested for the prediction of production volume from heterogeneous data sources that takes use of climate and crop-production data. Traditional machine-learning approaches and publicly available historical data from the National Water Commission and the Mexican Government's Agri-food Information Service were used to test this approach in the beginning. The data came from the northeastern part of the state of Puebla, Mexico.

III. SYSTEM ANALYSIS & DESIGN

EXISTING SYSTEM

A Convolutional Neural Network (CNN)-based technique for predicting the popularity of short videos was presented by Din et al. [18]. They used the CNN model to extract visual features from a large collection of short movies, then combined these traits with social network data to predict popularity. The results demonstrated that the deep learning model improves prediction accuracy by skilfully capturing complex interactions between visual and social information. Similar to this, Waqas et al. [19] suggested a Recurrent Neural Network (RNN)-based method for predicting the popularity of short videos. They used the RNN model to encode user behaviour sequences during brief video viewing, demonstrating better prediction accuracy while allowing for dynamic changes in user behaviour.

IoT technology integration for social media data collecting was investigated by Abidi et al. [20]. They developed a sensor-based and smart device-based data collecting system that allows the gathering of environmental data while watching brief videos, including temperature, humidity, and lighting. This dataset was useful for examining user watching habits and trends in the distribution of short videos. Furthermore, Liu et al. [21] investigated the potential of IoT technology for gathering data on user behaviour. They investigated user emotions and engagement levels by using IoT sensors to detect user movements and gestures while watching brief videos. Understanding user responses to short videos and

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predicting their popularity were made possible by these findings.

In conclusion, the continuous development and incorporation of well-established research methodology leads to a better and more accurate forecast of the popularity of short videos, which advances social interaction and digital media. In this work, a deep learning regression model-based system for predicting the popularity of short videos is presented, taking into consideration multi-modal feature fusion supervision modelling and carefully accounting for feature interactions. This study offers more informational dimensions for short video prediction by using IoT data.

DISADVANTAGES

- The inability of language models to comprehend textual data in films, including titles, descriptions, and user comments, is a drawback.
- The CPRP-CNN Model was not implemented in an existing system to process the stochastic distribution of short movies, which attracted a sizable user base when they were released.

PROPOSED SYSTEM

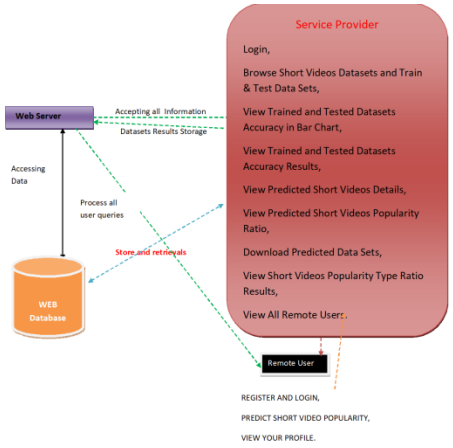
Accurately forecasting the popularity of short videos for social media platforms and content providers has significant monetary value, which is the driving force behind our suggested approach. Strategic content planning, which draws in more viewers and advertisers and eventually boosts income, is made possible by predicting which videos are most likely to become popular. Additionally, knowing how user behaviour varies by geography and culture makes it easier to offer tailored content, which raises user happiness. By revealing the potential uses of IoT technology and deep learning in cross-cultural communication research, this field of study advances our understanding of how information is disseminated and how social interactions differ and are similar across cultural backgrounds.

This study's main goal is to provide a strategy for forecasting short films' level of popularity in the context of cross-cultural communication. This project aims to provide useful insights and solutions for content providers, social media platforms, academic research, and the larger user community by integrating the Internet of Things (IoT) with a deep learning regression model.

ADVANTAGES

- The suggested solution used a multi-modal fused regression model to predict content popularity.
- Convolutional layers are used in the CPRP-CNN model to extract information from short movies' text. The model can extract distinct phrases and semantic information from the text by adjusting the convolutional kernel sizes and strides.

SYSTEM ARCHITECTURE



IV. IMPLEMENTATIONS

Modules

Service Provider

The Service Provider must use a working user name and password to log in to this module. After successfully logging in, he can perform certain tasks such Examine Train & Test Data Sets and Short Video Datasets. See the Accuracy of Trained and Tested Datasets in a Bar Chart, See the Accuracy Results of Trained and Tested Datasets, See the Details of Predicted Short Videos, See the Popularity Ratio of Predicted Short Videos, Download Predicted Data Sets, See the Popularity Type Ratio Results of Short Videos, and See All Remote Users.

View and Authorize Users

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The administrator may see a list of all registered users in this module. Here, the administrator may see the user's information, like name, email, and address, and they can also grant the user permissions. The administrator may see a list of all registered users in this module. Here, the administrator may see the user's information, like name, email, and address, and they can also grant the user permissions.

Remote User

A total of n users are present in this module. Before beginning any actions, the user needs register. Following registration, the user's information will be entered into the database. Following a successful registration, he must use his password and authorised user name to log in. Following a successful login, the user may perform tasks including registering and logging in, predicting the popularity of short videos, and seeing their profile.

ALGORITHMS

Naïve Bayes

The supervised learning technique known as the "naive bayes approach" is predicated on the straightforward premise that the existence or lack of a certain class characteristic has no bearing on the existence or nonexistence of any other feature. However, it seems sturdy and effective in spite of this. It performs similarly to other methods of guided learning. Numerous explanations have been put forth in the literature. We emphasise a representation bias-based explanation in this lesson. Along with logistic regression, linear discriminant analysis, and linear SVM (support vector machine), the naive bayes classifier is a linear classifier. The technique used to estimate the classifier's parameters (the learning bias) makes a difference.

Although the Naive Bayes classifier is commonly used in research, practitioners who wish to get findings that are useful do not utilise it as often. On the one hand, the researchers discovered that it is very simple to build and apply, that estimating its parameters is simple, that learning occurs quickly even on extremely big databases, and that, when compared to other methods, its accuracy is rather excellent. The end users, however, do not comprehend the value of such a strategy and do not receive a model that is simple to read and implement.

As a consequence, we display the learning process's outcomes in a fresh way. Both the deployment and comprehension of the classifier are simplified. We discuss several theoretical facets of the naive bayes classifier in the first section of this lesson. Next, we use Tanagra to apply the method on a dataset. We contrast the outcomes (the model's parameters) with those from other linear techniques including logistic regression, linear discriminant analysis, and linear support vector machines. We see that the outcomes are quite reliable. This helps to explain why the strategy performs well when compared to others. We employ a variety of tools (Weka 3.6.0, R 2.9.2, Knime 2.1.1, Orange 2.0b, and RapidMiner 4.6.0) on the same dataset in the second section. Above all, we make an effort to comprehend the outcomes.

Random Forest

Random forests, also known as random decision forests, are ensemble learning techniques that build a large number of decision trees during training for tasks like regression and classification. The class chosen by the majority of trees is the random forest's output for classification problems. The mean or average forecast of each individual tree is given back for regression tasks. The tendency of decision trees to overfit to their training set is compensated for by random decision forests. Although random forests are less accurate than gradient enhanced trees, they often perform better than choice trees. However, their performance may be impacted by data peculiarities.

Tin Kam Ho[1] developed the first algorithm for random decision forests in 1995 by utilising the random subspace technique, which in Ho's definition is a means of putting Eugene Kleinberg's "stochastic discrimination" approach to classification into practice.

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Leo Breiman and Adele Cutler created an algorithm extension and filed for a trademark in 2006 for "Random Forests" (owned by Minitab, Inc. as of 2019). The extension builds a set of decision trees with controlled variance by combining Breiman's "bagging" concept with random feature selection, which was initially proposed by Ho[1] and then separately by Amit and Geman[13].

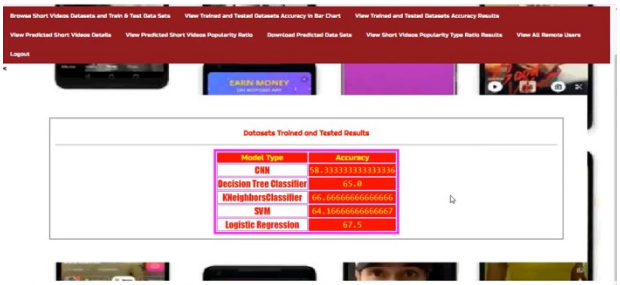
Businesses commonly employ random forests as "blackbox" models since they need little configuration and produce accurate forecasts across a variety of inputs.

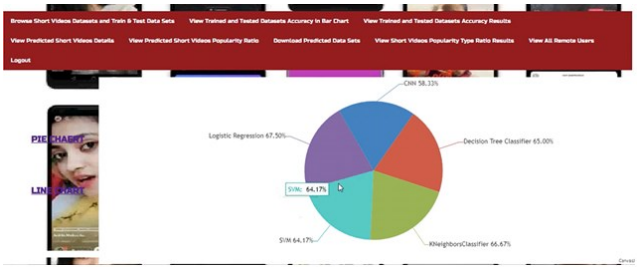
SVM

The goal of a discriminant machine learning approach in classification problems is to identify a discriminant function that can accurately predict labels for newly acquired instances based on an independent and identically distributed (iid) training dataset. A discriminant classification function takes a data point x and assigns it to one of the several classes that are part of the classification job, in contrast to generative machine learning techniques that call for calculations of conditional probability distributions. Discriminant techniques are less effective than generative approaches, which are mostly employed when prediction entails the identification of outliers. However, they need less training data and processing resources, particularly when dealing with a multidimensional feature space and when just posterior probabilities are required. Finding the equation for a multidimensional surface that optimally divides the various classes in the feature space is the geometric equivalent of learning a classifier.

SVM is a discriminant approach that, unlike genetic algorithms (GAs) or perceptrons, which are both often used for classification in machine learning, always returns the same optimal hyperplane value since it solves the convex optimisation issue analytically. The initialisation and termination criteria have a significant impact on the solutions for perceptrons. While the perceptron and GA classifier models are distinct every time training is started, training yields uniquely specified SVM model parameters for a given training set for a certain kernel that converts the data from the input space to the feature space. The sole goal of GAs and perceptrons is to reduce training error, which will result in several hyperplanes satisfying this criterion.

V. SCREEN SHOTS





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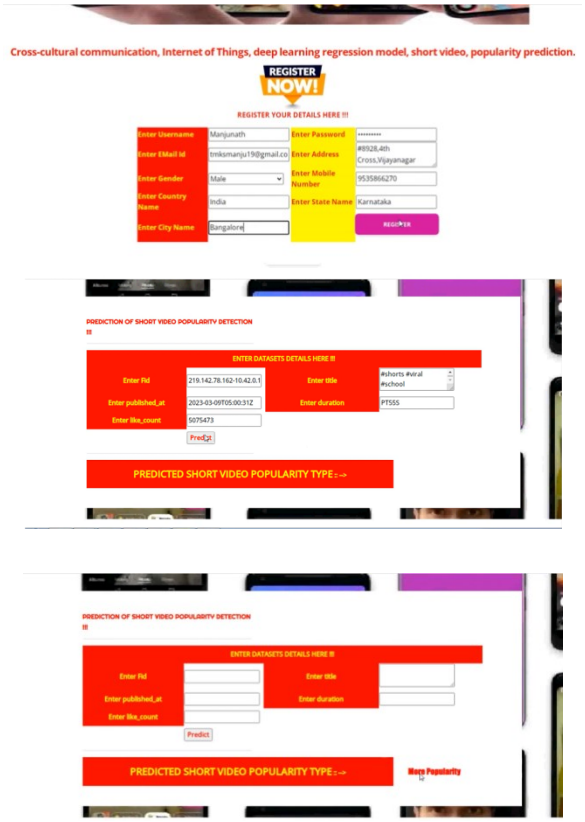

VI. CONCLUSION

A. RESEARCH CONTRIBUTION

This work presents the novel CPRP-CNN model, which integrates multi-modal data fusion with Internet of Things technology, in the context of cross-cultural communication. This model demonstrates proficiency in managing complex tasks by accurately predicting the popularity of short videos. Using fully connected layers for classification, regression, and other tasks, the CPRP-CNN model effectively pulls features from input data by using multi-layer convolution and pooling procedures [55]. Understanding the dynamics of short video popularity worldwide is the goal of the investigation of user behaviour and social interaction across various cultural backgrounds. The study uses a multi-modal feature fusion technique that incorporates text, graphics, and user behaviour data to capture user preferences in a variety of cultural situations as well as how users engage with brief films. In the field of popularity prediction, this model achieves notable performance [56].

B. FUTURE WORKS AND THE LIMITATIONS OF RESEARCH

At the moment, this study is limited to a particular social media platform and cultural setting. Future expansions will allow for a more thorough understanding by extending the reach to include other platforms and cultures. Moreover, large datasets are required for efficient training when using deep learning models. However, some cultural contexts could make gathering data difficult, which emphasises how important it is to solve data scarcity concerns. Taking up this task is a worthwhile way to conduct further research. When data is few, it is crucial to carefully choose representative characteristics that are relevant to the intended purpose. Algorithms for feature extraction or feature selection can be used to extract significant features from the source data or to find task-relevant features.

REFERENCES

[1] K.-M. Giannakopoulou, I. Roussaki, and K. Demestichas, ‘‘Internet of Things technologies and machine learning methods for Parkinson’s disease diagnosis, monitoring and management: A systematic review,’’ Sensors,vol. 22, no. 5, p. 1799, Feb. 2022.

[2] T.-V. Nguyen, N.-N. Dao, V. Dat Tuong,W. Noh, and S. Cho, ‘‘User-aware and flexible proactive caching using LSTM and ensemble learning in IoTMEC networks,’’ IEEE Internet Things J., vol. 9, no. 5, pp. 3251–3269,Mar. 2022.

[3] S. Aminizadeh, A. Heidari, S. Toumaj, M. Darbandi, N. J. Navimipour, M. Rezaei, S. Talebi, P. Azad, and M. Unal, ‘‘The applications of machine learning techniques in medical data processing based on distributed computing and the Internet of Things,’’ Comput. Methods Programs Biomed.,vol. 241, Nov. 2023, Art. no. 107745.

[4] L. O. Colombo-Mendoza, M. A. Paredes-Valverde, M. D. P. Salas-Zárate, and R. Valencia-García, ‘‘Internet of Things-driven data mining for smart crop production prediction in the peasant farming domain,’’ Appl. Sci.,vol. 12, no. 4, p. 1940, Feb. 2022.

International Journal of Information Technology & Computer Engineering
ISSN 2347–3657
Volume 13, Issue 2, 2025
https://doi.org/10.62647/ijitce.2025.v13.i2.pp726-735

[5] F. M. Aswad, A. N. Kareem, A. M. Khudhur, B. A. Khalaf, and S. A. Mostafa, ‘‘Tree-based machine learning algorithms in the Internet of Things environment for multivariate flood status prediction,’’ J. Intell.Syst., vol. 31, no. 1, pp. 1–14, Nov. 2021.
[6] A. Smerdov, A. Somov, E. Burnaev, B. Zhou, and P. Lukowicz, ‘‘Detecting video game player burnout with the use of sensor data and machine learning,’’ IEEE Internet Things J., vol. 8, no. 22, pp. 16680–16691, Nov. 2021.
[7] B. M. Reddy, ‘‘Amalgamation of Internet of Things and machine learning for smart healthcare applications—A review,’’ Int. J Comp. Eng. Sci. Res, vol. 5, pp. 8–36, Jun. 2023.
[8] J. Liu, J. Bai, H. Li, and B. Sun, ‘‘Improved LSTM-based abnormal stream data detection and correction system for Internet of Things,’’ IEEE Trans. Ind. Informat., vol. 18, no. 2, pp. 1282–1290, Feb. 2022.
[9] C. Chen, J. Li, V. Balasubramaniam, Y. Wu, Y. Zhang, and S. Wan, ‘‘Contention resolution in Wi-Fi 6-enabled Internet of Things based on deep learning,’’ IEEE Internet Things J., vol. 8, no. 7, pp. 5309–5320, Apr. 2021.
[10] T. Han, K. Muhammad, T. Hussain, J. Lloret, and S.W. Baik, ‘‘An efficient deep learning framework for intelligent energy management in IoT networks,’’ IEEE Internet Things J., vol. 8, no. 5, pp. 3170–3179, Mar. 2021.
[11] S. Latif, M. Driss, W. Boulila, Z. E. Huma, S. S. Jamal, Z. Idrees, and J. Ahmad, ‘‘Deep learning for the industrial Internet of Things (IIoT): A comprehensive survey of techniques, implementation frameworks, potential applications, and future directions,’’ Sensors, vol. 21, no. 22, p. 7518,Nov. 2021.
[12] B. Chen, L. Liu, M. Sun, and H. Ma, ‘‘IoTCache: Toward data-driven network caching for Internet of Things,’’ IEEE Internet Things J., vol. 6, no. 6, pp. 10064–10076, Dec. 2019.
[13] V. Chamola, V. Hassija, S. Gupta, A. Goyal, M. Guizani, and B. Sikdar, ‘‘Disaster and pandemic management using machine learning: A survey,’’ IEEE Internet Things J., vol. 8, no. 21, pp. 16047–16071, Nov. 2021.
[14] T. J. Saleem and M. A. Chishti, ‘‘Deep learning for the Internet of Things: Potential benefits and use-cases,’’ Digit. Commun. Netw., vol. 7, no. 4, pp. 526–542, Nov. 2021.
[15] A. Mellit and S. Kalogirou, ‘‘Artificial intelligence and Internet of Things to improve efficacy of diagnosis and remote sensing of solar photovoltaic systems: Challenges, recommendations and future directions,’’ Renew. Sustain. Energy Rev., vol. 143, Jun. 2021, Art. no. 110889.
[16] L. Li, Y. Xu, J. Yin, W. Liang, X. Li, W. Chen, and Z. Han, ‘‘Deep reinforcement learning approaches for content caching in cache-enabled D2D networks,’’ IEEE Internet Things J., vol. 7, no. 1, pp. 544–557, Jan. 2020.
[17] Z. Ghaffar, A. Alshahrani, M. Fayaz, A. M. Alghamdi, and J. Gwak, ‘‘A topical review on machine learning, software defined networking, Internet of Things applications: Research limitations and challenges,’’ Electronics, vol. 10, no. 8, p. 880, Apr. 2021.
[18] I. U. Din, M. Guizani, J. J. P. C. Rodrigues, S. Hassan, and V. V. Korotaev, ‘‘Machine learning in the Internet of Things: Designed techniques for smart cities,’’ Future Gener. Comput. Syst., vol. 100, pp. 826–843, Nov. 2019.
[19] M.Waqas, K. Kumar, A. A. Laghari, U. Saeed, M. M. Rind, A. A. Shaikh, F. Hussain, A. Rai, and A. Q. Qazi, ‘‘Botnet attack detection in Internet of Things devices over cloud environment via machine learning,’’ Concurrency Comput., Pract. Exper., vol. 34, no. 4, p. e6662, Feb. 2022.
[20] S. M. R. Abidi, Y. Xu, J. Ni, X. Wang, and W. Zhang, ‘‘Popularity prediction of movies: From statistical modeling to machine learning techniques,’’ Multimedia Tools Appl., vol. 79, nos. 47–48, pp. 35583–35617, Dec. 2020.
[21] L. Liu, H. Hu, Y. Luo, and Y.Wen, ‘‘When wireless video streaming meets AI: A deep learning approach,’’ IEEE Wireless Commun., vol. 27, no. 2, pp. 127–133, Apr. 2020.

International Journal of Information Technology & Computer Engineering
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Volume 13, Issue 2, 2025
https://doi.org/10.62647/ijitce.2025.v13.i2.pp726-735

[22] K. Abbas, M. K. Hasan, A. Abbasi, S. Dong, T. M. Ghazal, S. N. H. S. Abdullah, A. Khan, D. Alboaneen, F. R. A. Ahmed, T. E. Ahmed, and S. Islam, ‘‘Co-evolving popularity prediction in temporal bipartite networks: A heuristics based model,’’ IEEE Access, vol. 11, pp. 37546–37559, 2023.

[23] K. Brito and P. J. L. Adeodato, ‘‘Machine learning for predicting elections in Latin America based on social media engagement and polls,’’ Government Inf. Quart., vol. 40, no. 1, Jan. 2023, Art. no. 101782.

[24] D. Martín-Gutiérrez, G. Hernández Peñaloza, A. Belmonte-Hernández, and F. Álvarez García, ‘‘A multimodal end-to-end deep learning architecture for music popularity prediction,’’ IEEE Access, vol. 8, pp. 39361–39374, 2020.

[25] A. A. Mubarak, H. Cao, and S. A. M. Ahmed, ‘‘Predictive learning analytics using deep learning model in MOOCs’ courses videos,’’ Educ. Inf. Technol., vol. 26, no. 1, pp. 371–392, Jan. 2021.