International Journal For Advanced Research In Science & Technology
A peer reviewed international journal www.ijarst.in
ISSN: 2457-0362

# A MACHINE LEARNING-BASED MODEL FOR FORECASTING THE QUALITY OF MOBILE APPLICATIONS

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**Abstract**

Online content has a significant impact on consumers' purchasing choices. Customer reviews show how knowledgeable they are about quality and expertise. In the Google Play store, false numerical ratings may greatly impact the success of apps. It's well known that a high star rating is often linked to good reviews. Still, user star ratings don't always provide the same information as reviews written in text format. This research shows how an efficient machine learning method may predict how apps will do in the Google Play Store.

Keywords— Machine Learning, Google,Play Store, ,Online, Rating .

## INTRODUCTION

It is essential to use machine learning approaches in order to tackle several difficulties. Machine learning has a lot of room to develop and may be used in many different ways. It seems to reason that ML might come up with the most reasonable explanations for its outputs. Although the world is filled with information, not all of it need names. Therefore, while we wait, we will enhance its unsupervised learning skills. Neuronal network architectures are anticipated to get more unexpected as a means of discriminating amongst all the more semantically important highlights. With the aid of deep learning and these areas of interest, we may potentially finish more tasks and adapt better. The importance of mobile applications in people's life is growing in the current day. Research shows that the proliferation of mobile advertising apps has a major effect on cutting-edge innovation. However, the market for mobile apps is growing at a steady rate, and there has been a corresponding increase in the number of people working to create these apps. The global market for portable apps would undoubtedly see increased revenues as a result.

Fig. 1. Mobile App

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It is critical for a designer to know he is heading in the correct way while competing with enormous worldwide competition. In order to maintain their position in the market and this income, the application designers may have to figure out how to maintain their current job. Google Play is now believed to be the biggest app store. It seems to earn a far less amount of money compared to the Apple App Store, while having more than twice as many downloads. For this purpose, I retrieved data from the Play Store and used it to direct our inquiry. The fast development of smart cells has made mobile apps, also known as mobile applications, an integral part of our daily lives. But it's hard for us to stay up with the newest innovations and completely understand the applications since new ones are appearing on the market daily. Almost one million apps on Android1market in September 2011 is a decent amount of success. There are now 0.675 million Android apps available in the Google Play App Store. Having so many options is, according to everyone, a fantastic chance for consumers to choose and choose. For customers who utilize flexible application platforms, online application surveys seem to play a substantial role in paid applications. Prospective buyers have a hard time sifting through all the reviews and evaluations of literature in order to make a choice. Application developers would also benefit from understanding the bulk of written remarks as they have a hard time figuring out how to improve the application's performance based on broad evaluations.

BACKGROUND

The group headed by R. Gomes, among others, Building inference engines that can forecast application ratings using Random Forest and KNN regression methods is the main objective of the project. The Random Forest produced better results than the KNN [1]. Offline experiments conducted on three large-scale datasets by C. Zhu et al. confirm AIM's superior performance. After conducting a three-week online A/B test in a popular app store, AIM found that their DeepFM model increased their CTR by 4.4% [2]. Members of the Bhat group, G. S., who are Find out whether the levels of fine particles (PM) detected inside using PEFR (short for particle emission monitoring system) are related to the weather outdoors. Each participant's maximal peak flow value determines their PEFR result category: "Green" (Safe), "Yellow" (Moderate Risk), and "Red" (High Potential). The correlation between the weather reports, indoor PM levels, and PEFR measurements is shown using a
Z. Wu et al. state that there are three potential causes of mismatches between descriptions and permitted usages: 1.

The involvement of humans in crafting the description; 2. The prevalence of activities that misuse permissions; and 3. The sheer volume of developers. Thanks to these findings, app developers will be able to enhance app descriptions and make better use of permissions [4]. The research by Z. Shen et al. aims to predict which apps a user will utilize on her phone in the next time frame. A variety of smartphone features, such content pre-caching and app pre-

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loading, rely on this data to improve the user experience [5]. A new cross-triplet deep feature embedding approach called CDFE is introduced by Z. Xu and colleagues for the cross-app JIT bug prediction challenge. By including a state-of-the-art cross-triplet loss function, a deep neural network trained using the CDFE technique can comprehend the high-level feature representation of the cross-app data [6]. According to research by K. Zhao et al., who tested 10 Android apps, SDF beat competing methods on three different performance criteria [7]. By comparing the results with other machine learning methods, G. Aceto et al.[8] show that they perform as well as a state-of-the-art machine learning predictor called A Random Forest Regressor. To further improve ML assessment (and maybe its design) [8], we provide a fair and understandable baseline in this work and a practical and theoretically sound set of tools for traffic analysis. By merging the outputs of many tiers of modules that use the attention mechanism of recurrent neural networks, Y. Zhang et al. are able to build multi-step time series predictions. With an effective decrease of 0.088 in terms of the Root Mean Square Error (RMSE) [9], Dee POP outperforms state-of-the-art methods in real-world dataset studies as far as prediction accuracy is concerned. A fairness-based approach to app recommendation, FARM, is introduced by Q. Zhu et al. When developing suggestions, the primary study for this method is on the problem of equity. This method proposes using a recommendation algorithm to categorize APP applicants into two groups: those with high visibility and those with low visibility [10]. A group of researchers led by S. şahın; The dependability of SISO FIR DFE decision feedback may be estimated using a novel method dubbed "based soft feedback" that uses either expectation propagation (EP) or a posteriori probability (APP) based on online prediction. This novel strategy stands in stark contrast to well-established alternatives Experimental evidence suggests that filter processing improves detection accuracy [11]. In this study, S. Rezaei et al. provide a deep learning approach for identifying mobile apps that can operate with encrypted communication. The suggested approach is well-suited for early prediction-based applications like as routing and quality-of-service provisioning as it only requires the contents of the first few packets for categorization. [12].

METHODOLOGY

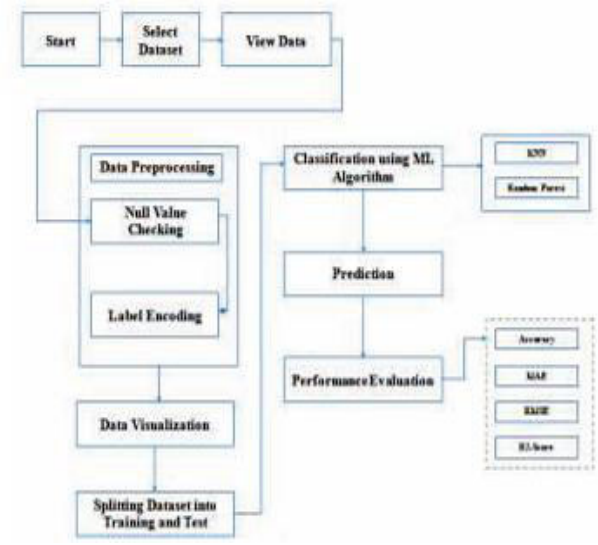


Fig. 2. Flow Chart To address every drawback of the current system,

Here is the proposed model. This strategy will increase the precision of the categorization results by sorting the data

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according to the Google Play applications. A large amount of semi-structured or unstructured data that does not contribute substantially to the prediction process was extracted from the Google Play store. Vector representation of text is necessary for training supervised machine learning systems. To do this without losing any information, textual data must be translated into numbers. Estimate an app's rating using machine learning techniques such as KNN and Random Forest regressions. In the end, the performance of the classifiers is evaluated by looking at their accuracy, MAE, RMSE, and R2 Score.

SIMULATION RESULTS T

To do the proposed calculation, Python Spyder 3.7 is used. Using the os, matplotlib, pyplot, pandas, sklearn, numpy, and pandas libraries, we can take use of Spyder Climate's capabilities for a variety of approaches.

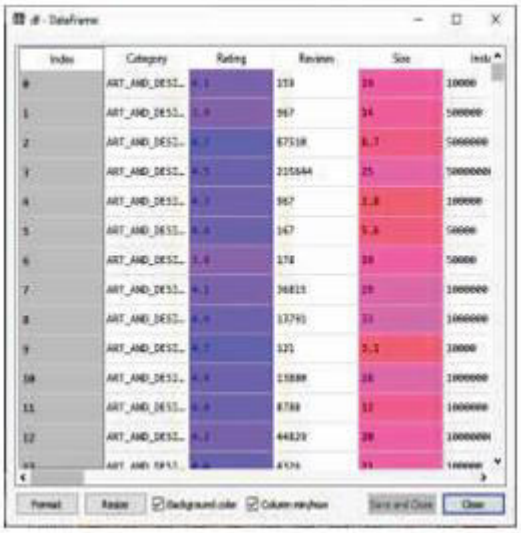

Figure 3 is showing the dataset in the python environment.

There is a wide range of row and column counts in the dataset. Additionally, the name of the signal characteristics is provided.

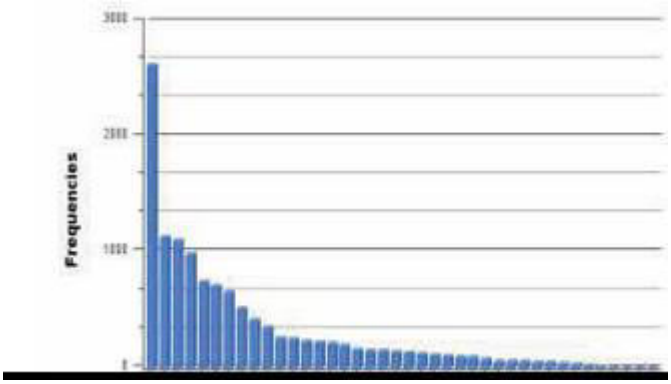


Fig. 4. Distribution of rating

The chart shows the distribution of rating forecasts for the Play Store on Google. The rating scale goes from 1.0 (the lowest possible) to 4.9 (the highest possible). With a lower maximum and lower rating, a quality app often has an average rating between 3.9 and 4.5.

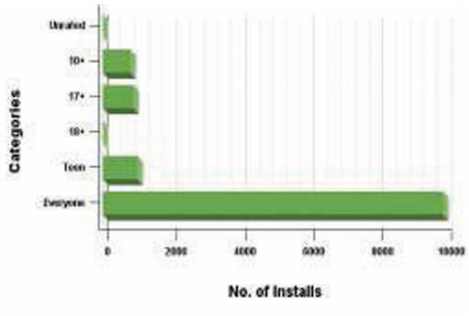


Fig. 5. Apps by content rating

Various applications are shown in Figure 5 according to their content ratings. The most popular apps are those that everyone uses, whereas apps for teens, adults, and those without ratings have less downloads.

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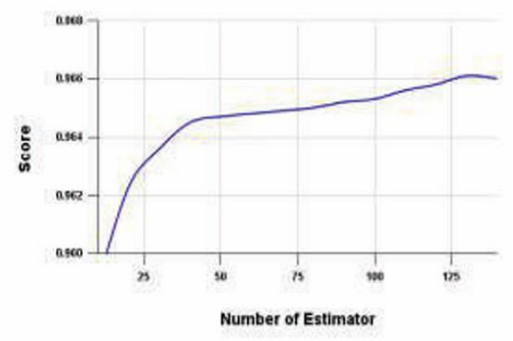


Fig. 6. Effect of estimators

There may be up to 140 estimators in total, and their effects are shown in Figure 6. For several checks, the cumulative score is close to 95%.

TABLE. I. Sr. No. SIMULATION RESULTS(KNNREGRESSION)

| Sr. No. | Parameter Name | Value |
|---|---|---|
| 1 | Accuracy | 95.15% |
| 2 | MAE | 0.27466% |
| 3 | RMSE | 0.4478 % |
| 4 | R2_Score | 0.9213% |
| 5 | Error rate | 4.87% |

TABLE. II. Sr. No. Parameters RESULTCOMPARISON

| Sr. No. | Parameters | Previous Work [1] | Proposed Work |
|---|---|---|---|
| 1 | Accuracy | 93.9% | 95.6% |
| 2 | Error rate | 6.2 % | 4.47% |

## CONCLUSION

This research demonstrates an efficient machine learning strategy for predicting app ratings in the Google Play Store. The increasing number of Android applications available in the Google Play Store has captured the interest of many app developers. Knowing what makes highly rated applications pop in the Google Play Store is crucial for developing successful Android apps. In comparison to the previous method, which produced an accuracy of 93.8%, the proposed method attains a total accuracy of 95.41%. The proposed work has an error rate of 4.59%, compared to 6.2% in the previous study. Consequently, the proposed effective approach outperformed the previous one. that came before.

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