Movie Picker: Movie Recommendation System using Collaborative Base Algorithm

Gene Phillip D. Artista Department of Computer Education

Bachelor of Science in Computer Science

Calamba, Philippines [genephillipartis@gmail.com](mailto:genephillipartis@gmail.com)

                      Bryan Emmanuel B. Paz

             Department of Computer Education

                 Bachelor of Science in Computer

                                   Science

                        Calamba,Philippines

                     bryanpaz53@gmail.com

***Abstract*— *Movies are one of the sources of entertainment, but the problem is in finding the desired content from the ever-increasing millions of contents every year. However, recommendation systems come much handier in these situations the purpose of this research is to develop a movie recommender system using a collaborative filtering technique and Levenshtein distance algorithm. Collaborative filtering is the most successful algorithm in the recommender system’s field. A recommender system is an intelligent system that can help a user to come across interesting Movie. Movie recommendation systems are important tools that suggest films/movie with respect to users’ choices. The number of movies has increased to become more congested therefore, to find a movie that users are looking for through the existing technologies is very hard. For this reason, the users want a system that can suggest the movie requirement to them, and the best technology for this is the recommendation system. However, most recommendation systems are using collaborative filtering methods to predict the needs of the user due to this method gives the most accurate prediction. Today, many researchers are paying attention to develop several methods to improve accuracy rather than using collaborative filtering methods. Hence, to further improve accuracy in the recommendation system, we present the User-Based Collaborative filtering***

***Keywords— Movie Picker: Movie Recommendation System Using Collaborative Base Algorithm***

I.INTRODUCTION

**Background of the study 1.1**

Recommendation systems (RS) are predicting systems that radically recommend users to the items and items to users and sometimes users to users too like Netflix, YouTube, and Amazon Prime, use similar methods to recommend video content according to their desired interest. As the internet contains vast loads of data, finding your content is very difficult and can be very time-consuming. Thus, the recommendation plays an important role in minimizing our effort. These systems are getting more popular nowadays in various areas such as movies, books, videos and music, and other social network sites where the recommendation is used to filter out the information. It uses the user’s information to improve the suggestion result and give out the most preferred choice. User satisfaction is key for building the tool. It is beneficial for both customers and companies. The more satisfied the customer is, the more likely they would want to use the system for their ease, which would ultimately make revenues for the companies. The recommendation system should continuously be improved as the user choice can differ from other users, and if the user is not happy with the result, they might not use it again, which is the case with our system.

In today's hectic environment, recommendation systems are becoming increasingly crucial. People are always pressed for time due to the numerous chores that must be completed in the allotted 24 hours. As a result, recommendation systems are helpful since they assist them in making the best decisions without requiring them to use their cognitive resources (Vaishali Advani, 2020).

Signh et al. (2021) Stated that Recommendation System (RS) is a clever computer-based approach that predicts based on user adoption and usage and assists them in selecting.

Goods from a large pool of online items. Most internet users have undoubtedly come across an RS in some capacity. For example, Facebook suggests us to prospective friends, and YouTube recommends videos to its users, Glassdoor advises appropriate employment, TripAdvisor recommends appropriate vacation places, Goodreads recommends fascinating books, and so on. RS has found widespread popularity in the e-business world. E-commerce platforms like eBay, Amazon, and others use RS to lure customers by overflowing with items that buyers should, presumably, enjoy.

However, some problems may occur in this kind of system, like the lack of data needed to be analyzed and recommended to a specific user. And also, the fact that recommendation systems require a large amount of data to produce good recommendations is perhaps the most significant challenge the researcher may face. Accurate recommended information could also be an issue.

Khusro et al. (2016) recognize the presence of privacy as an issue since personal information is fed to recommender systems to improve recommendation services. Still, it raises concerns about data privacy and security. Users are hesitant to provide data to recommender systems that have privacy concerns. However, recommenders who use Collaborative Filtering are more vulnerable to privacy concerns. When new users join the system, or new items are added to the catalog, this problem occurs. In such instances, neither the new users' tastes nor the new items' ratings or purchases can be expected, resulting in less reliable suggestions.

(Baptiste Rocca, 2019). The importance of using recommender systems cannot be emphasized, given its ability to alleviate numerous over-choice issues. There are a variety of recommendation systems available, each with its own set of approaches and concepts. Various applications, such as e-commerce, healthcare, transportation, agriculture, and media, have embraced recommendation systems. Fayyaz et. al (2020). Collaborative filtering is, without a doubt, the most efficient way for developing a recommender system. It presupposes that a user's item preferences may be deduced collaboratively from the preferences of other users. In practice, users' previous interactions with products, such as explicit ratings or implicit feedback, are commonly utilized to infer taste similarity among users for the purposes of recommendation. Chen et. al (2020).

Recommender systems usually use collaborative filtering algorithms or a combination of the collaborative filtering algorithms and the other filtering algorithms to find users who have similar tastes and suggest items. We conducted the movies recommender system by using collaborative filtering and Levenshtein distance algorithm,

**TYPES OF RECOMMENDER SYSTEM**

     Over the years, recommender systems have been studied widely and are divided into different categories according to the approach being used. The categories are collaborative filtering (CF), content based and context based.

**Collaborative filtering**

Collaborative filtering (CF) uses the numerical reviews given by the user and is mainly based upon the historical data of the user available to the system. The historical data available helps to build the user profile and the data available about the item is used to make the item profile. Both the user profile and the item profile are used to make a recommendation system. The Netflix Competition has given much popularity to collaborative filtering Collaborative filtering is considered the most basic and the easiest method to find recommendations and make predictions regarding the sales of a product. It does have some disadvantages which has led to the development of new methods and techniques

**Content Based filtering**

Content Based filtering (CB) focus on the features of the products and aim at creating a user profile depending on the previous reviews and also a profile of the item in accordance with the features it provides and the reviews it has received It is observed that reviews usually contain product feature and user opinion in pairs. It is observed that users’ reviews contain a feature of the product followed by his/her opinion about the product. Content based recommendation systems help overcome sparsity problem that is faced in collaborative filtering-based recommendation system.

**Conceptual Framework**

**Statement of the problem**

Movies are one of the sources of entertainment, but the problem is finding the desired content from the increasing millions of thousands of movie content every year. However, Movie recommendation systems come much helpful in these situations. For building a Movie recommender system from scratch, we face several difficulties problems currently there are many recommender systems based on Collaborative filtering. Most movie recommender systems are web-based, so creating mobile-based is more complicated So we get these questions.

1. What should we do if the website has not gotten enough users?
2. How to recommend movies when there is no user information.
3. What kind of movie features can be used for the recommender system?
4. How to calculate the similarity between two movies.

**Why Movie Recommender Systems?**

1.Given the increasing amount different variety of movies, can be somewhat complex and challenging to users movie recommender system help choosing from such a wide range of options

2. To prevent overwhelmed users from making poor decisions, recommender systems came into focus, facilitating users’ access to information about the items they are most likely to be interested, whether such items are movies.

**Why the researcher need to create Dataset?**

1. Due to copyright, Netflix data is not available for download. So, to perform the recommendation evaluation on the movies domain, we created our own data set

.

2. The **Geneflix** dataset consists of anonymous ratings of movies collected by the **Geneflix** Research that currently uses a movie recommendation system based on collaborative filtering.

4. The data set was collected and made available by the Research.

**Why hybrid system approach?**

A combination of different approaches and algorithms combine to increase the potency of recommendation system is called as hybrid system. Hybrid system helps to correct the present system additionally. The content and cooperative filtering face the cold start problem. Hybrid system will help to solve this problem to some extent.

**Objective of the study**

The goals of this thesis project is to do the research of Recommender Systems and find a suitable way to implement it for Vionel.com. There are many kinds of

Recommender Systems but not all of them are suitable for one specific problem and situation. Our goal is to find a new way to improve the classification of movies, which is the requirement of improving content-based recommender systems

* To provide a mechanism to assist users in classifying users with similar interests.
* To produce an accurate movie recommendation both uniquely and globally to the user.
* To increase user engagement to the system.

**Definition of Terms**

Vast- very great area or extent;

Hectic- being overly busy or full of activity

(RS)- Recommendation System

(CF)-Collaborative filtering

(CBF)-Content Based filtering

II. REVIEW OF RELATED LITERATURE

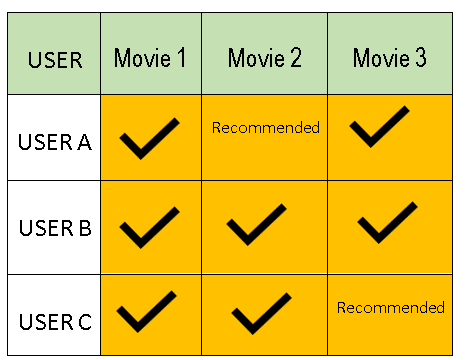
**Recommendation filtering techniques**

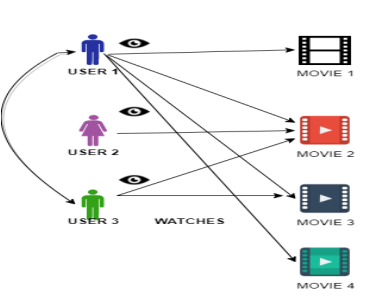
Pavel Kordík, (2018) Machine learning algorithms in recommender systems are typically classified into two categories content-based and collaborative filtering methods, although modern recommenders combine both approaches.

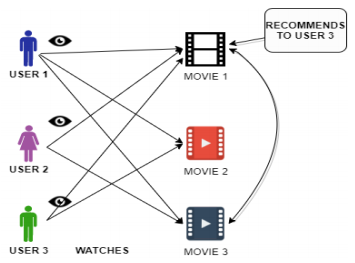
Several hybrid methods have been proposed trying to encompass more than one approach. Some of them implement collaborative filtering and content-based methods separately and then combine their predictions. Others incorporate content-based characteristics into collaborative filtering or the other way around.

Upwork Staff ( 2021) Content-based filtering is a type of recommender system that attempts to guess what a user may like based on that user’s activity. Content-based filtering makes recommendations by using keywords and attributes assigned to a database and matching them to a user profile. The user profile is created based on data derived from a user’s actions, such as purchases, ratings (likes and dislikes), downloads, items searched for on a website and/or placed in a cart, and clicks on product links. Content-based filtering is a Machine Learning technique that uses similarities in features to make decisions. This technique is often used in recommender systems, which are algorithms designed to advertise or recommend things to users based on knowledge accumulated about the user. The content-based approach requires a good amount of information about items’ features rather than users’ interactions and feedback. For example, it can be movie attributes such as genre, year, director, actor, etc., or textual content of articles extracted by applying Natural Language Processing.

Luo Shuyu (2018) Collaborative filtering (CF) is a common recommendation algorithm that relies its forecasts and recommendations on other users' ratings or behavior. On the other hand, Collaborative Filtering requires nothing more than the users' previous preferences on a set of items. Because it's based on historical data, the core assumption here is that the users who have agreed in the past tend to also agree in the future.

Collaborative filtering (CF)is a type of personalized recommendation strategy that identifies the similarities between users (based on site interactions) to serve relevant product recommendations across digital properties. Recommender systems collect user information, mining this data to inform which items to display. In terms of user preference, it is usually expressed by two categories explicit rating is a rate given by a user to an item on a sliding scale, like five stars for Avenger. This is the most direct feedback from users to show how much they like an item ****implicit rating suggests user’s preference indirectly, such as page views, clicks, purchase records, whether or not to listen to a music track, and so on in

There are two classes of Collaborative Filtering: User-based collaborative filtering is an important technique used in collaborative filtering recommender systems to recommend items based on the opinions of like-minded nearby users, where similarity computation is the critical component, this technique used to predict the items that a user might like on the basis of ratings given to that item by the other users who have similar taste with that of the target you. Item-based collaborative filtering is a model-based algorithm for making recommendations. In the algorithm, the similarities between different items in the dataset are calculated by using one of a number of similarity measures, and then these similarity values are used to predict ratings for user-item pairs not present in the dataset

 **Figure 1. Demonstration of User-Based CF**

**Figure 2. Demonstration of User-Based CF**

In the user-based, it is assumed that the user will like the movie that are liked by users with whom they have similar tastes. Consider Table below as an example, all the users like movie 1 and people who like movie 1 also like movie 3, Item-based are not dynamic in nature and do not change.

**Figure 3. Table Demonstration of User-Based**

**Deep Dive into Netflix's Recommender System**

Netflix's recommendation system holds a significant influence over how the platform operates and how users engage with the service despite this, the platform has offered limited transparency around how this system is designed and how it performs. This is concerning given that the company's recommendation systems have raised concerns about biased and discriminatory outcomes. In addition, Netflix offers users only a limited set of controls over how algorithmic decision-making shapes their platform experience.

David Chong (2020) Netflix is synonymous to most people in this day and age as the go-to streaming service for movies and tv shows. 80% of stream time is achieved through Netflix's recommender system, which is a highly impressive number. Moreover, Netflix believes in creating a user experience that will seek to improve retention rate, which in turn translates to savings on customer acquisition (estimated $1B per year as of 2016)

According to the article of Albert Christopher (2020), a recommendation engine is a data filtering tool that uses data and algorithms to filter a catalog predicting relevant items and products to the user. Recommendation engines combine both content-based and collaborative-based approaches. The content-based approach relies on the intrinsic items the user has earlier showed interest in, thus suggesting a similar pattern of these properties. On the other hand, a collaborative-based approach analyzes all the service users and recommends a new user based on the relevant items of the other users having a similar taste.

According to the article of New America (2020), Today, Netflix's recommendation engine is a machine learning-driven collection of algorithms that serve different purposes and collectively create the Netflix streaming experience. This recommendation system offers multiple categories of recommendations. Most of these categories of recommendations reside on the homepage, which is the page that a user first sees when they log into their profile on any device. the different types of recommendation algorithms that comprise Netflix's recommendation system (1) Personalized Video Ranker (PVR): The PVR algorithm operates on the Netflix homepage and presents users with the entire catalog of titles available on the platform for the region in which they live, as well as certain categories of titles filtered by specific genre-based themes in a personalized manner. (2) Top N Video Ranker the Top N video-ranker algorithm is used to produce recommendations for titles that appear in the Top Picks row on the homepage. This algorithm is designed to identify a limited number of personalized recommendations from the entire Netflix catalog based on titles that are ranked highly. (3) Continue Watching Video Ranker (CWR): The CWR is a video ranking algorithm used to order the titles that appear in the Continue Watching row on the home page. (4) Video-Video Similarity (Sims): The Sims algorithm is an algorithm used to generate the Because You Watched (BYW) row, which features recommendations that are generated based on a user's consumption of one particular title.

Netflix added another layer of personalized recommendations to the homepage of its users, known as the Top 10 list. The list is updated daily and the positioning of the row on a user’s homepage is dependent on how relevant Netflix believes the titles in the list are to each user.

Base on in Business Insider article reported by Travis Clark (Feb 26, 2020) The streaming giant announced that it will include daily top 10 lists of its most popular TV shows and movies on the service in the US starting this week (other countries will have their own top 10 lists). An overall list spanning movies and TV will appear on the Netflix homepage. Netflix said that the position of the list "will vary depending on how relevant the shows and films are to you. “The top TV show list and the top movie list will appear on those respective pages when a user clicks on the movie or TV tabs.

**Overview of Amazon's Recommendation Systems**

**Collaborative Filtering**

Mamta Singhal (2020) While the world has been focusing on user-based Collaborative Filtering. Amazon came up with the algorithm where product recommendations are not just on similarities between customers but correlations between products in 2003. With item-to-item collaborative filtering, the recommendation algorithm would review the visitor’s recent purchase history and, for each purchase, pull up a list of related items. Items that showed up repeatedly across all the lists were candidates for recommendation to the visitor. But those candidates were given greater or lesser weight depending on how related they were to the visitor's prior purchases.

According to the article of Lineate.com(2019), Amazon Recommendations Amazon practically invented the concept of giving personalized product recommendations after online purchases, using an algorithm they call “item-based collaborative filtering.” This algorithm makes the homepage of each of its many millions of customers unique, based on their interests and previous purchasing history.

Amazon doesn’t only use the purchase data of each of its customers. They also utilize the purchase histories of other people that purchased the same product, giving “frequently bought together” information on their product listings. Furthermore, they factor in customer feedback and ratings. How? By offering recommendations that match a customer’s interests as well as reported customer satisfaction, price, and quality level.

Amazon continues to improve their collaborative filtering by connecting purchase history with browsing data. If, for instance, a customer purchased socks, Amazon may not suggest just socks in the future. Instead, their algorithm may look at an individual’s browsing history, see they watch a superhero movie on Prime, and in turn, recommend Marvel brand shirts. To Amazon, interpreting massive amounts of divergent data in real-time is key, and this recommendation engine is responsible for a whopping 35% of their total revenue.

**Mobile Application**

Agnieszka Mroczkowska (2021) A mobile application (also called a mobile app) is a type of application designed to run on a mobile device, which can be a smartphone or tablet computer. Even if apps are usually small software units with limited function, they still manage to provide users with quality services and experiences. Mobile is a growing industry that attracts businesses from every marketplace. No wonder mobile app revenues are projected to reach almost $600 billion in 2020. The exploding popularity of smartphones and tablets has made mobile application development an increasingly popular trend among business owners worldwide.

Jyoti Gupta(2020) Mobile applications have become an inseparable part of our lives. We have a mobile app for almost everything from socializing, shopping, travel booking, learning to watch our favorite movies and TV shows. Since millions of mobile applications are already there on the Google Play Store and Apple’s App Store, it is not easy for a new app to grab the attention of users.

Alfred (2021), there are millions of mobile apps on the app store today. Some have been successful, while others have found it hard to strive in the highly competitive app market. One thing has, however been common with all successful mobile apps. And that is, they all have a great look and feel.

Many users are looking for applications that look appealing and feel good when using them. A visually appealing and engaging app usually results from having an efficient User Experience (UX) and User Interface (UI). The best mobile app developers will tell you; an app has to be developed while putting much emphasis on its Ul/UX design since that’s where success for your app begins.

User Interface (UI) refers to User Interface. It entails the appearance of an application when a user is interacting with it. User Interface ensures the user can easily interact with the application. UI includes the app’s design, graphics, and presentation. An effective User Interface should be attractive to the users. User Experience (UX) comprises human feelings, perceptions, emotions, and preferences during and after using an application. An App’s accessibility, simplicity, usability enhances a satisfactory user experience. To create an efficient UX design, you need to conduct thorough research on the needs of your target audience.

An excellent User Interface will create an instant attraction to your app, while a superb User Experience will put a lasting impact on your users’ minds. It is therefore vital to get both of them right if you want your app to be successful.

Invision(2020) stated that mobile app design is the task of designing mobile applications. Even though mobile apps have a wide variety of uses, what unifies them is the need for optimal usability, accessibility, engagement, and overall user experience, in short addressing all the above concerns.

Girish R(2021)Listed The Leading mobile application development frameworks that developers need to explore in 2021 (1)Flutter is the new trending cross-platform mobile application development technology in town. It uses “Dart” as a programming language instead of JavaScript, facilitating rapid and effective analysis, fabricating UIs, including highlights, and fixing bugs in milliseconds. (2) React Native This JavaScript open-source framework has become the most preferred native mobile app development technology. It offers ample support to IDEs and other mobile app development tools and enables the development of native apps for iOS and Android platforms. React Native framework allows to build native mobile apps with JavaScript, using the same design as React. (3) Ionic uses the HTML5 programming language and is widely preferred for mobile app development today. It combines HTML, CSS3, and JavaScript to build native apps and create their UI functionalities with ease. This mobile app development technology works on iOS’s UI WebView or Android’s WebView. (4) Xamarin This cross-platform framework with coding advantages of C# uses single code across iOS, Android, Windows, and other platforms. (5) Native Script Originally developed by Progress (Telerik by Progress), Native Script is one of the most desired open-source frameworks to develop Apple iOS and Android apps today. Native Script allows developers to build mobile apps using JavaScript or any other language that trans-compiles to JavaScript (e.g., TypeScript). Native API reflection, Angular integration, and Vue.js integration is some of the notable features of Native Script. The framework also allows developers to re-purpose third-party libraries from Maven, npm.js, and Cocoa Pods into their apps without using any wrappers. Build a Recommendation Engine

With Collaborative Filtering

Abhinav Ajitsaria(2019)Most websites like Amazon, YouTube, and Netflix use collaborative filtering as a part of their sophisticated recommendation systems.by using this you technique to build recommenders that give suggestions to a user on the basis of the likes and dislikes of similar users.To experiment with recommendation algorithms, you’ll need data that contains a set of items and a set of users who have reacted to some of the items.The reaction can be explicit (rating on a scale of 1 to 5, likes or dislikes) or implicit (viewing an item, adding it to a wish list, the time spent on an article).While working with such data, you’ll mostly see it in the form of a matrix consisting of the reactions given by a set of users to some items from a set of items. Each row would contain the ratings given by a user, and each column would contain the ratings received by an item. Collaborative Filtering is the most common technique used when it comes to building intelligent recommender systems that can learn to give better recommendations as more information about users is collected.

**Related Studies**

[2], R. E. Nakhli, H. Moradi, and M. A. Sadeghi (2019) proposed the percentage view approach for recommending movies to the users, it finds relevant movies for the customer and then compares the performance with a random movie recommendation system for showing the accuracy of the project.

[3], a content-based recommendation system is proposed by H. W. Chen, Y. L. Wu, M. K. Hor, and C. Y. Tang using neural networks. In recent years, these are top topics for the researchers to work on when they want to build a movie recommendation system.

[1], C. S. M. Wu, D. Garg, and U. Bhandary (2018) proposed a recommendation system using collaborative filtering where a user’s rating is used to suggest the list. The authors have used the Apache Mahout framework and essentially compared the performances and efficiency of us er-based & item-based recommendations.

[4] Pooja and Bhupender Sharma (2018) conducted a study Movie Recommendation System: A Review Report which aims to represents the overview of Approaches and techniques generated in recommendation system. Recommendation system is categorized in three classes: Collaborative Filtering, Content based and hybrid-based Approach. This paper classifies collaborative filtering in two types Memory based and Model based Recommendation. The paper elaborates these approaches and their techniques with their limitations. The result of our system provides much better recommendations to users because it enables the users to understand the relation between their emotional states and the recommended movies.

[5]Yen-Liang Chen, Yi-Hsin Yeh and Man-Rong Ma (2021) conducted a study titled " A movie recommendation method based on users' positive and negative profiles " the aims of this study to focus on how to identify users' preferences for movies by using a collaborative filtering algorithm to predict the users’ movie ratings. and create two movie lists for each user, where one is the movies, the user likes (with higher predicting or true ratings), the other is the movies the user does not like (with lower predicting or true ratings). Based on these two movie lists, the researcher establishes a user positive profile and a user negative profile. The research algorithm will recommend to user’s movies that are most similar to their positive profile and most different from their negative profile.

[6]A. Pal, P. Parhi and M. Aggarwal (2017), has published a paper on Collaborative Filtering applications Titled "Improved content based collaborative filtering algorithm for movie recommendations “In this study the researcher used a hybrid methodology which takes advantage of both Content and Collaborative filtering algorithm into account. The algorithm discussed the different from the previous work in this field as it includes a novel method to find the similar content between two items. The study incorporates an analysis that justifies this new methodology and how it can provide practical recommendations. The above approach is tested on existing user and objects data and produced improved results when compared with other two favorite methods, Pure Collaborative Filtering, and Singular Value Decomposition.

[7]Thakker, U., Patel, R. & Shah, M. proposed a comprehensive analysis on movie recommendation system employing collaborative filtering. (2021) discusses the prowess CF algorithm and its applications for Movie Recommendation System (MRS)the study gives a brief overview of collaborative filtering consisting of two major approaches user-based approach and Item-based approaches. Further, in model-based filtering methodology, it is discussed how machine learning algorithms can be implemented for movie recommendation purposes and also to predict the ratings of the unrated movies and bifurcate or sort movies as per the user preference. Followed by, it throws some light on the methodologies used in the late past and some of the basic approaches that are taken into consideration to incorporate it into MSR. Additionally, this paper anatomized many of the recent past studies in depth to draw out the essence of the researches and studies, its crucial steps, results, future scope and methodologies, followed and suggested by multiple researchers and they discussed various challenges in MRS and probable future developments in this field. It is to be noted that various challenges in the field of CF recommendation systems like cold start, data sparsity, scalability issues, etc. were raised and many approaches tried to tackle these challenges in innovative and novel ways.

[8]J. Lund and Y. Ng (2018) proposed a method about Movie Recommendations Using the Deep Learning Approach, Recommendation systems are an important part of suggesting items especially in streaming services. For streaming movie services like Netflix, recommendation systems are essential for helping users find new movies to enjoy. In this Study the researcher proposed a deep learning approach based on autoencoders to produce a collaborative filtering system which predicts movie ratings for a user based on a large database of ratings from other users. Using the MovieLens dataset, we explore the use of deep learning to predict users' ratings on new movies, thereby enabling movie recommendations. To verify the novelty and accuracy of our deep learning approach the researcher compares their approach to standard collaborative filtering techniques: k-nearest-neighbor and matrix-factorization.

[9]N.Immaneni, I. Padmanaban, B. Ramasubramanian and R. Sridhar (2017), conduct a research about A meta-level hybridization approach to personalized movie recommendation," Recommender systems help users to find their favorite products based on their historical preferences. They are commonly utilized in a variety of areas such as movies, music, research articles, search queries and social tags. They exploit the power of social knowledge bases to detect semantic similarities among items and users. In this study a personalized meta-level hybrid recommendation technique that combines collaborative and content-based approaches in a hierarchical manner is proposed to suggest movies to users. The recommended movies are depicted using a sequence of images describing the story plot for better visual appeal.

[10] Furtado, F., Singh, A. (2020) proposed a study about Movie recommendation system using machine learning.in study this the researcher aim is to reduce the human effort by suggesting movies based on the user’s interests. To handle such problems they introduced a model combining both content-based and collaborative approach. It will give progressively explicit outcomes compared to different systems that are based on content-based

approach.

[11]Lavanya R., Khokle T., Maity A. (2021) proposed a hybrid approach is more conducive for movie recommendations on mobile devices as it combines the best of the most widely employed methods. This allows the results to be scalable when handling big data tasks as is very common in movie recommendations given the large amount of reviews. In a number of reviews, every user also voices their opinion and analyzing this sentiment is crucial in order to understand the emotional investment a person has in the movie. Therefore, after using a hybrid approach, this study uses sentiment analysis to filter the results further.

[12] Singh, Ashwani and Soundarabai, Paulsingh. (2017) proposed a study of Collaborative filtering in movie Recommendation System Based on Rating and Genre. Recommendation that are generated using rating and genre helps in finding best similar users, which will be able to find best movies for users, but finding correlation between Hugh amount of users need very good computing power, but accuracy is good as compared to item-based collaborative filtering when we have dense data, and it is also good for the scenario where data changes frequently and users viewing pattern changes. In future start cast, director and IMDB review of movies can be taken into consideration to obtain more relevant recommendation, complete movie database and user view from social media can be included to find interested of same gender age group.

[13]Chen, Y. (2018) has published a research on personalized recommendation algorithm based on user preference in mobile e-commerce. Based on this, this paper studies the personalized recommendation algorithm based on user preferences in mobile e-commerce. In this paper, user preference model under UTA algorithm is constructed on the basis of user rating on multiple criteria of the project, and user preference clustering is used to improve the scalability problem of personalized recommendation The simulation is conducted according to the proposed personalized recommendation algorithm based on user preference. The simulation data use the multi-criteria rating data from 6078 users of Yahoo! Movies website for 976 movies (including 62,156 rows of data).

[14]Harris Papadakis, Nikos Michalakis, Paraskevi Fragopoulou, Costas Panagiotakis, and Athanasios Malamos. (2017) conducted a study titled Movie SCoRe: Personalized Movie Recommendation on Mobile Devices this Recommender systems try to predict the preferences of users for specific items, based on an analysis of previous consumer behavior. In this paper the researcher present Movie SCoRe, a mobile device application for personalized movie recommendation, based on a novel recommendation algorithm. This easy-to-use application allows users to effortlessly specify their preferences by rating already watched movies. The application, in turn, employs the aforementioned state-of-the-art algorithm in order to provide the user with accurate, personalized movie recommendations and describe the design, implementation and functionality of the mobile-based application as well as the basis of the underlying recommendation algorithm.

[15]Senthilselvan N. Subramaniyaswamy V., Sivaramakrishnan N., Amir. H. G. (2020) has published a research paper Resolving data sparsity and cold start problem in collaborative filtering recommender system using Linked Open Details in this study proposed a method to overcome the data sparsity and the cold start problem in Collaborative filtering (CF). For cold start issue, Recommender System with Linked Open Data (RS-LOD) model is designed and for data sparsity problem, Matrix Factorization model with Linked Open Data is developed (MF-LOD). A LOD knowledge base “DBpedia” is used to find enough information about new entities for a cold start issue, and an improvement is made on the matrix factorization model to handle data sparsity. Experiments were done on Netflix and MovieLens datasets show that our proposed techniques are superior to other existing methods, which mean recommendation accuracy is improved.

**CHAPTER III**

**METHODOLOGY**

This chapter will present a description of the research design, research respondents and research instruments The data collection instrument is detailed, as well as the methods employed in the area to maintain the instrument's validity.

**3.1 Research Design**

In order to see whether the algorithms use in this research provide a support for the system and meets the research objectives. The researcher will use a descriptive approach of study to describe different subject of this topic. A survey forms and observation will be used to gather data. The respondents of this study will be the individual who has the capability to use and evaluate certain conditions in smart phone devices.

Since this is a descriptive approach of study, the researchers will undertake an in-depth evaluation of each component using a mixed method of interpretation. To confirm any recognized conditions that may be specific to a particular area of study.

**3.2 Algorithm Design and Techniques**

**Algorithm Technique use in this study**

­

Algorithm

Collaborative Base Filtering

(Main Function Algorithm)

…………Algorithm

(Sub Function Algorithm)

**3.3 Software Development and Methodology**

REFERENCES

1. <https://www.mygreatlearning.com/blog/masterclass-on-movie-recommendation-system/>
2. <https://www.researchgate.net/publication/339172772_Recommender_Systems_An_Overview_Research_Trends_and_Future_Directions>
3. <https://towardsdatascience.com/introduction-to-recommender-systems-6c66cf15ada>
4. <https://fardapaper.ir/mohavaha/uploads/2019/03/Fardapaper-Recommender-Systems-Issues-Challenges-and-Research-Opportunities.pdf>
5. <https://www.frontiersin.org/articles/10.3389/fdata.2019.00049/full>
6. <https://www.granthaalayahpublication.org/ijetmr-ojms/index.php/ijetmr/article/view/IJETMR20_A06_2124>