Survey on Ranking Fraud for Mobile Apps

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Abstract— In today's world there are many fraud ways through which app developers try to put their app at the first position. The developers try hard to configure the positions of various apps in the list of apps in that particular area. Mobile phones operating system is developing day by day but research in fraud apps is limited or not much discovered. Fraud ranking in mobile phones lead to download of the false app which allows damaging the mobile phones and falsely getting famous by that false apps. Fraud ranking in mobile phones is very important and this paper shows the misinterpretation of the apps information and configured apps position. Also a framework is used for fraud detection in apps. The work is grouped basically into three categories. First is web ranking spam detection, second is the online review spam detection and third one is mobile app recommendation. The first method Web ranking spam refers to any kind of actions which bring to selected Web pages an unjustifiable favorable relevance or give much importance. The second one is Review spam which is designed to give unfair view of some objects so as to influence the consumers' perception of the objects by directly or indirectly damaging the object's reputation. The third one is mobile app recommendation which tells users to check the app usage record.

Keywords- Apps in mobile phones, Fraud ranking Detection, Evidence, Aggregation of evidence,   Ranking Records, Rating, Review

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I.   INTRODUCTION

The mobile apps are growing rapidly and everyday many apps get launched as well as many apps get closed. And in these many apps there are many fraud apps which can completely damage mobile phones. There are many apps supporting many operating system such as android and Mac. As apps are growing daily and many new apps are launched everyday so it gets difficult for viewer to select the best apps, so many App stores launches daily App leader boards, which shows the rankings of various popular Apps[2][4]. The App leader board is one of the most important ways for detecting weather that app is true or not. A most higher rank on the leader board usually shows `that a large number of downloads have occurred and have million dollars in revenue. Many App developers try to find out various ways like advertising to promote their Apps so that their Apps is ranked as high as possible in such App leader boards[1][2][3].Instead of moving on old marketing techniques, false App developers have started fraud apps to increase their position of apps and ultimately manipulating the rankings at the store[4]. The evidences like ranking, rating and review are being used. Ranking evidences means the ranking of the apps according to their popularity. User can see the popularity list and can decide the level of apps in play store. In rating evidences, resolving the problem of "restriction of time reduction" is done, identifying of fraud evidences is also surveyed by the app rating records[4][6]. As it is known that rating is been done after downloading by the user, and if the rating is high in leader board then it is attracted by most of the users[7]. The review based aggregation that contains some text as comments as reviews by the app user and before downloading or using the app user mostly refer to the reviews given by most of the users. This is usually done by downloads, ratings and reviews in short time[5][7].

There are works, like web positioning spam recognition, online survey spam identification and portable App suggestion, but the problem of difference in the position is misrepresentation in the mobile Apps is till being researched. The problem of detecting fraud ranking apps in mobile Apps is still not developed much[4][6]. To overcome the various problems regarding the fraud app is the build of such a system for positioning misrepresentation by discovering framework for portable apps that is the model for detection of fraud ranking apps in mobile phones. For this, we have to identify several important challenges. The

very First, fraud is happening at any time during the whole cycle of app, so the identification of the exact time of fraud is important[7]. The Second is due to the large number of mobile Apps, it is very difficult to manually label ranking fraud for each App, so it is very important for automatically detection of fraud without any help of any basic information[6][7]. In some *leading events* ranking that is fraud usually happens in leading sessions. The main target is to detect the fraud ranking of mobile Apps within leading sessions. The First is an propose of an effective algorithm to identify the leading sessions of each App based on its ranking records. With the analysis of Apps ranking behaviors, finding out the fraud Apps generally have different ranking patterns in each and every leading session compared with normal Apps[7].some fraud evidences are characterize from Apps' historical ranking records.The three functions are then developed to extract ranking based fraud evidences. Further again two types of fraud evidences are proposed based on Apps rating and review, which reflects some patterns from Apps rating and review. In addition to integrate these three types of evidences, an unsupervised evidence-aggregation method is developed which is used for evaluating the credibility of leading sessions from mobile Apps. Although some of above processes can be used for anomaly detection from rating and reviewing records, they are not able to extract fraud evidences in a limited given time period[4][5] .

In the next section, literature survey is done which shows various methods for recent fraud apps problems very briefly. Limited by space, a systematic survey is far beyond the scope of the paper.

II. LITERATURE SURVEY

A)Spamicity Approach to Web Spam Detection [1]:

Ranking spam detection of web is mainly deals with the analysis of ranking principles of various search engines, such as Page Ranking and query term frequency. This is different method from ranking fraud detection for mobile Apps. This system introduce the level of spamicity to get exactly how a page is a spam. Spamicity is a more flexible and user-controllable measure. The method efficient online link spam and mark spam detection methods using method of spamicity[2]. Also methods do not need training and are of less cost. A real data set is used to evaluate the accuracy and the efficiency of the various methods.

B)Detecting Spam Web Pages through Content Analysis [2]:

It is used to detect users generating spam reviews or review spammers. They identify several characteristic behaviors of spammers review and model these behaviors so as to detect the spammers. There is an injection of artificially-created pages into the web in order to affect the results from search engines. The system takes some past-undefined techniques for automatically detect the spam pages, the system combines the methods of-detecting spam to create a highly accurate C4.5 classifier. The system can correctly check 86.2% of all spam pages, while showing very few fraud pages as spam. This system is useful in finding the accurate number of fraud and true pages by looking at their content and deciding the accuracy of the webpage.

C)*Detecting Product Review Spammers using Rating Behaviors [3] :*

The system detects the spam review generated by users. It deals with the degree of spam. In this review rating of particular target products is being manipulated. The system shows a behavioral approach to find re-view spammers who try to change review ratings on some target products. There is an derivation of an aggregated behavior scoring methods to rank reviewers according to the degree they show the spamming behaviors. To show the methods, conduction of user evaluation. Also it also found that out perform the baseline method based on helpfulness votes. This allows new user to make an idea weather that app is true or not by looking at the ranking list in the leader board. Target can be a single product or groups of products.

D)*HYSAD[4]*:

A Semi- Supervised Hybrid Shilling Attack Detector for Trustworthy Product Recommendation [4] it is based on the semi-supervised learning and is used for good product recommendation. A presentation of a Hybrid Shilling Attack Detector, which is used for tackling the spam problems. This system tells a process called HYSAD.Generally, HYSAD is a semi supervised learning that uses both unlabeled and labeled user profiles for various-class modeling. It is one of the growing techniques in hybrids attacks which completely damage the system internally as well as externally. It is very efficient in detection of hybrid attacks in the system as well as measures to recover from that and further safe it from other attacks. Now a days hybrid attacks is very common and many attackers use the hybrid type of attack. Semi supervised is the environment in which the knowledge is gained by itself or by the experience and take decision upon it and take action upon it.

E)Review Spam Detection via Temporal Pattern Discovery [5]:

Problem is solved by by detection of the co-anomaly patterns in various review based time series. Although some

of the methods can be used for anomaly detection from rating and review records, they are not able to extract fraud evidences. The system shows the problem of detection of singleton review spam which is problem. There is an identification of three aggregate statistics which are of the type of spam attack, then construction of a multidimensional time series using various statistics. It design a multi-level anomaly detection algorithm on multi-dimensional time series based on curve fitting. Experiments results show that the proposed algorithm is effective in detecting singleton review spams. It is useful for the new users to get the proper review about the particular website in the proper way. Singleton review is aggregation of various reviews and finding a single It gathers various information from various websites and get the single review about the webpage which helps the new user to get the idea of the webpage in the short time and take decision according to it. It is one of the efficient method as aggregation of reviews are done and single review is done which helps the new user in a very efficient way. Also not such technical terms is required for the new user or a normal user, so any user can use it and take decision according to that and get the idea about the page.

Summary about the related work is given in below Table1 as Survey Table difficult and important .There is an transform of the problem to a discovery of temporal pattern

Table1: Summary of Literature review

Sr no	Techniue	Advantages	Disadvantages	Result
1	Link spamicity	Any normal user can use this without having much technical knowledge	It is often hard to label a web page absolutely spam or non-spam.	Effective for finding various spam pages
2	Spam detection	Correctly identify spam pages up to 86%	Not such efficient in ranking of spam pages	Detection of spam pages
3	Rating behavioral procedure to detect review spammers	Used for finding spammers in easy way	Cant review both spam detection as well as attacker	The detected spammers have more impact on ratings which is not helpful reviewers
4	Hybrid shilling attack detector	It is effective against hybrid attacks	Filtering is difficult	It generally improve the accuracy of the collaborative-filtering based on recommender system
5	Hierarchical way algorithm	More effective in detection of singleton review attacks	It is difficult to aggregate review	Helps in detection of the windows time where such type of attacks are likely to happen

III. CONCLUSION

The discovery of fraud apps on various fraud apps existing methods which is being used for finding of web spam , also which is in relation with the fraud ranking in mobile Apps. Also fraud ranking in mobile apps is in relation with online review spam detection and mobile App recommendation. With the help of data recommendation the leading sessions of mobile Apps, fraud app leads to position the fraud ranking. The priority sessions used for Finding the local anomaly of various App rankings. The system leads to detection of the various ranking frauds based on three types of evidences, such as ranking based , rating based and review based evidences. Along with this, there is an optimization based aggregation method combines all three evidences to detect the fraud.

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