A METHOD FOR PREVENTING DISCRIMINATION IN DATA MINING

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ABSTRACT

Discrimination is a presuppose privileges where provide to the each separate group for the safety of the data which is stored .discrimination is two type direct and in direct discrimination is supported sensitive data . Direct discrimination is supported sensitive data. In direct discrimination is supported unrestricted information . In existing system standard algorithm is used. Sometimes the data should be lost. In this data model sensitive information should be free. It doesn't successfully handle the indirect discrimination problems which are associated to direct discrimination. In the system using the new techniques to prevent the sensitive information .Discrimination deterrence methods In term of data quality and discrimination detach for both direct and indirect discrimination

Keyword: Discrimination, Direct and Indirect Discrimination, Privileges

I. INTRODUCTION

In sociology, discrimination are the prejudices handling of an individual supported their membership in a certain collection. It affects refusing denying to members of one grouping chances that accessible to additional groups. There is a list of antidiscrimination acts as, which is laws of nature configured to foreclose favoritism laws designed to prevent discrimination on the basis of a number of attributes (e.g., race, religion, gender, nationality, disability, marital status, and age) in various settings (e.g., employment and training, access to public services station, credit and insurance, etc.).

For example, commons commercialize the implements the precept by equate discussion between human beings in the access to and supply of goods and armed services in matters of employment and occupation in. Although there are some laws abutting discrimination, all of them is reactive, not proactive. Technology can add proactively to legislation by contributing discrimination discovery and prevention techniques. Services in the information society allow for automatic and routine collecting of large amounts of information. Those information is frequently applied to the aim association/classification rules in view of making automatic decisions, like loan granting/denial, insurance premium computation, personnel selection, etc.

At first sight, determinations might apply a sense of fairness: categorization rules: do not guide themselves by personal favourite. However at an closer appear, one and only actualizes that categorization conventions are actually learned from the system (e.g., loan according) by the aiming data from the training data. Whenever aimed are essential predetermined as or against an exceptional community biased for or against a particular community (e.g., foreigners), the discovered model might appearance prejudice behavior. In other discussions, the organization might deduce that just now being adventives are legitimatize intellect as loan denial.

Describing such as possible prejudices and rejecting it by the aiming information without harming their decision making utility is therefore highly desirable. One essential preclude information mine laying of getting itself an beginning of discrimination, since by information mine laying undertakings getting discriminative models of predetermine of the automat zed selecting. In, they are established that data mining could comprise some an source of discrimination and an means since distinguishing discrimination. Discrimination is classified two types direct or indirect (also called systematic). Direct discrimination conventions or operations that integrally mention minority or disfavored groups supported judicious discriminatory indirect discrimination will as well comprise referred to because redlining and conventions causation indirect discrimination will comprise addressed redlining rules. Indirect discrimination dismissed from a few background knowledge conventions for instance, that a certain zip code

corresponds to agree to a degenerating area or a area on mostly black universe. The background acquaintance might be approachable of in public usable information (for instance., census information) or could comprise base from the original data set itself because of the existence of non discriminatory attributes that is extremely correlate on the sensible ones in the original information set.

II. LITERATURE SURVEY

1) CLASSIFICATION WITH NO DISCRIMINATION BY PREFERENTIAL SAMPLING

We can remove the sensitive data instead of relabeling it. The new solution to the CND problem by introducing a sampling scheme for making the discrimination free instead of relabeling the data set. The algorithm is used in this paper is classification algorithm. The goal of classification is to accurately predict the target class for each care in the data. Predicts categorical labels and classify the data based on the training set and the values in a classifying attribute and uses it in classifying new data. The techniques used in this paper is Pre-processing, Preferential sampling, Over sampling, Uniform sampling. In preprocessing there are a lot tangential and excess data present or noisy and so knowledge uncovering during the aiming stage are a lot of elaborated . Data preparation and filtering steps can considerable amount of processing period. Data pre-processing includes cleaning, normalization, transformation and characteristic extraction selection.

In Preferential sampling arises when the process that determines the data location and the process being modeled are stochastically dependent. In the over sampling. In the over sample are the action of sample importantly higher than the doubly the twice the band width or peak relative frequency of the signal comprising sampled. Over sampling sample aids avoid aliasing, answer and brings down noise. The equation is used fS=2bb Where fs are the sample relative frequency and b are the bandwidth or maximum relative frequency of signal. Thenyquist rate is then 2b.the Uniform sampling defined as each Data objects probability is uniform. In this paper disadvantage is Discrimination were removed in ethical and legal region.

2) THREE NAIVE BAYES APPROACHES FOR DISCRIMINATION FREE CLASSIFICATION

In this method naive bayes is modify for discrimination classification. Discrimination laws do not allow the use of these rules of attributes such as gender, religion. Using decision rules that base their decision on these attributes in classifier. The approaches are used in this paper Naviesbayesmodel, Latent variable model, and Modifiednaivesbayes. The naivesbayes model is Abayes classifier is a simple possibility classifier based on applying bayes theorem with strong statistical independence assumption. Depending on precise nature of the probability model, naviebayes classifiers can be trained very efficiently in supervised learning. A latent variable model is a numerical model that relates a set of variables to set of latent variables. The responses on the indicators or manifest variables are the results of an individual's position on the latent variables. The modified naviebayesisModify the probability distribution p(s/c) of the sensitive attribute values s given the class values .

3) FAST ALGORITHM FOR MINING ASSOCIATION RULES

Fast algorithm is an efficient algorithm used to avoid the discrimination in data mining. In this paper algorithm apriori, aprioritid, AIS algorithm, apriorihybrid algorithm. The apriori algorithmic rule are the adult detail sets by the early authorize comprised reached aim the fresh candidate detail . Pruning comprised represented applying the information that some subdivision of itemset.

The difference for determining the support the database is not used after the first pass. In the AIS algorithm .In the AIS algorithm involves two concepts are extension of an item set, determining what should be in the candidate item set .The apriori hybrid algorithm is Uses apriori in the early passes and later shifts to aprioritid .In this paper disadvantages is An extra cost is sustained when shifting from apriori to aprioritid.

4) DISCRIMINATION PREVENTION IN DATA MINING SINCE INTRUSION AND CRIME DETECTION

In this paper techniques is used the anti discrimination techniques. Antidiscrimination law to the natural law about the correct by people to comprise addressed. In the governmental involvement people essential comprise addressed on active equal base in some cause by sex activity, age, race, nationality. The approaches are used pre

processing, post processing. The pre processing is data pre processing is the important process in the data mining. In there are more than tangential and excess information represent or noisy and uncertain information, and then knowledge discovery on the aiming point are heavier

The analyzed information that are not represented carefully screened out as much troubles may develop misleading answers. The post processing are the action by categorization through with large amounts of information and cleaning our applicable data. Data mining in acknowledgment to initiative resource preparation are the statistical and ordered analysis from large sets by transaction information mining in relation to enterprise resource planning is the statistical and logical analysis of large sets of transaction data. the algorithm used in this paper is not efficient this is main drawback of this paper.

5. VISUAL DATA MINING FOR HIGHER-LEVEL PATTERNS: DISCRIMINATION- AWARE DATA MINING AND BEYOND

In this paper, we propose a visualization approach that can on the one hand be applied to any (classification or association) rules, but that is appropriate to bringing out characteristic of mined patterns that are especially important in discrimination-aware and privacy aware data mining. We define new interestingness proceeding for items and rules and show various ways in which these can help in highlighting information in communicating settings. We conclude by arguing how this approach can lead to a new generation of feedback and awareness tools. The need to inspect mining results carefully for such meta-level relationships between features and outcomes becomes even stronger when specific data, rules and other patterns become the object of scrutiny: The flipside of data mining is that it may make relationships visible that various stakeholders do not wish to become explicit, and that the patterns it finds may suggest actions that various stakeholders do not wish to be taken. Such concerns may lead to a new approach to keep and/or treat these data as private.

III. PROPOSED SYSTEM
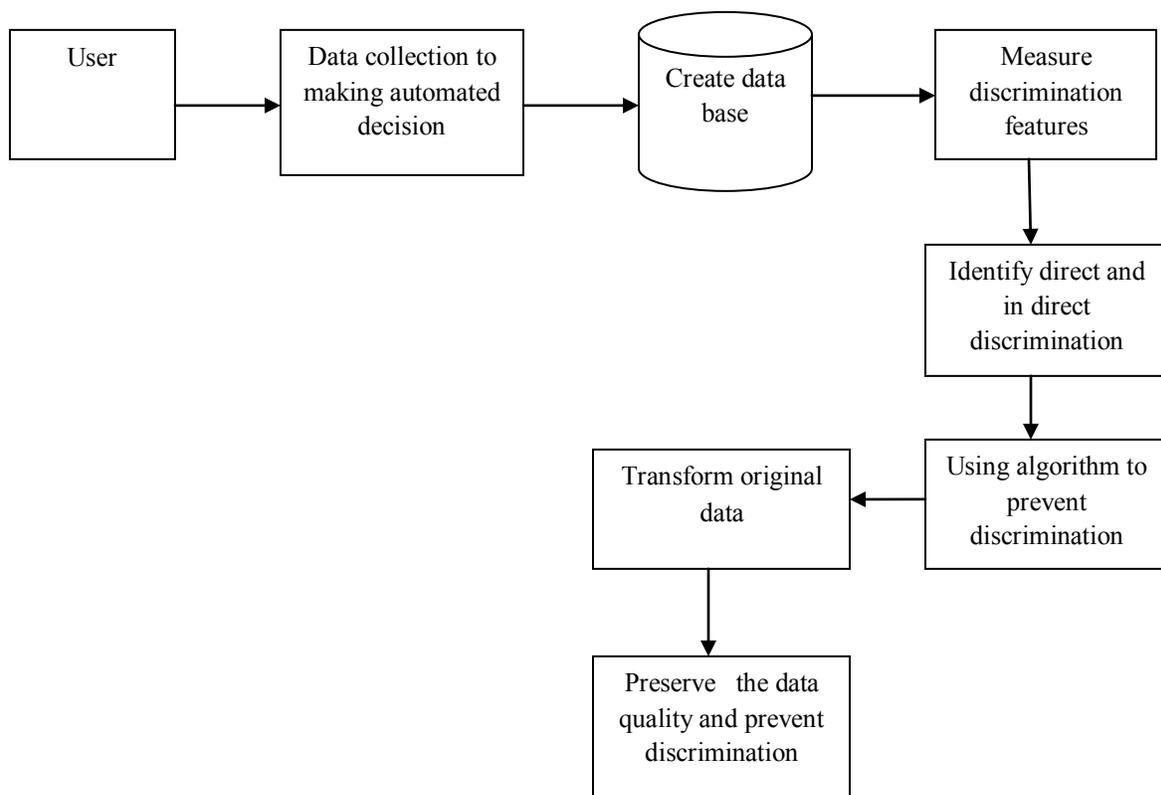
SYSTEM ARCHITECTURE

Our Proposed data transformation methods rule protection and rule generalization are based on measures for both direct and indirect discrimination and can deal with several discriminatory items. We demonstrate an integrated approaching to address and indirect discrimination prevention, on finalized algorithmic rule and all potential information shift ways confirmed rule protection and or convention generalization that could indirect discrimination prevention. We suggest fresh utility amounts to evaluate the a different aimed favoritism prevention processes in terms by information quality and discrimination removal as some direct and indirect discrimination. Direct and indirect discrimination discovery includes identifying discriminatory rules and redlining rules.

Using the above transformation methods effectively to identify the categories and remove direct and indirect discrimination method. Finally, discrimination free data models can be produced from the transformed data set without seriously damaging data quality. Discrimination prevention techniques in conditions by information character and discrimination removal because some direct and indirect discrimination.The proposed techniques are quite successful in both goals of removing discrimination and preserving data quality.

IV. MODULES DESCRIPTION

1) AUTOMATED DATA COLLECTION

Data mining is an increasingly important technology for extracting useful knowledge hidden in large collections of data. The problems outlined above can be eliminated when production data is collected automatically. When production data is collected automatically as it happens, you can be assured that it is timely, accurate, and unbiased. Until recently, automatically collecting production data was a costly and unreliable proposition.

There are, however, negative social perceptions about data mining, among which potential privacy invasion and potential discrimination. The latter consists of unfairly treating people on the basis of their belonging to a specific group. Automated data collection and data mining techniques such as classification rule mining have paved the way to making automated decisions, like loan granting/denial, insurance premium computation, etc. If the training data sets are biased in what regards discriminatory (sensitive) attributes like gender, race, religion, etc., discriminatory decisions may ensue. For this reason, antidiscrimination techniques including discrimination discovery and prevention have been introduced in data mining.

Services in the information society allow for automatic and routine collection of large amounts of data. Those data are often used to train association/classification rules in view of making automated decisions, like loan granting/denial, insurance premium computation, personnel selection, etc. At first sight, automating decisions may give a sense of fairness: classification rules do not guide themselves by personal preferences.

2) MEASURE THE DIFFERENT TYPES OF DISCRIMINATION

To construct the automated data collection database consist of discrimination rules. To measure the discrimination it has two types

1. Direct discrimination
2. Indirect discrimination

Negative social perceptions about data mining, among which potential privacy invasion and potential discrimination Discrimination can be either direct or indirect. Direct discrimination occurs when decisions are made based on sensitive attributes. Indirect discrimination occurs when decisions are made based on non sensitive attributes which are strongly correlated with biased sensitive ones.

3) DIRECT DISCRIMINATION MEASURE

Direct discrimination consists of rules or procedures that explicitly mention minority or disadvantaged groups based on sensitive discriminatory attributes related to group membership. Translated the qualitative statements in existing laws, regulations, and legal cases into quantitative formal counterparts over classification rules and they introduced a family of measures of the degree of discrimination of a PD rule. One of these measures is the extended lift (elift).

The purpose of direct discrimination discovery is to identify α discriminatory rules. In fact, α discriminatory rules indicate biased rules that are directly inferred from discriminatory items (e.g., Foreign worker). We call these rules direct α discriminatory rules. In addition to elift, two other measures slift and olift were proposed . indirect discrimination measure

Indirect discrimination consists of rules or procedures that, while not explicitly mentioning discriminatory attributes, intentionally or unintentionally could generate discriminatory decisions. Redlining by financial institutions (refusing to grant mortgages or insurances in urban areas they consider as deteriorating) is an archetypal example of indirect discrimination, although certainly not the only one. With a slight abuse of language for the sake of compactness, in this paper indirect discrimination will also be referred to as redlining and rules causing indirect discrimination will be called redlining rules.

Indirect discrimination could happen because of the availability of some background knowledge (rules), for example, that a certain zip code corresponds to a deteriorating area or an area with mostly black population. The background knowledge might be accessible from publicly available data (e.g., census data) or might be obtained from the original data set itself because of the existence of nondiscriminatory attributes that are highly correlated with the sensitive ones in the original data set.

The purpose of indirect discrimination discovery is to identify redlining rules. In fact, redlining rules indicate biased rules that are indirectly inferred from nondiscriminatory items.

4) DISCRIMINATION PREVENTION BASED ON THE MEASUREMENT

To measure the discrimination prevention it has two types

1. Direct Discrimination Prevention

2. Indirect Discrimination Prevention

Our approach for direct and indirect discrimination prevention can be described in terms of two phases

1. Discrimination measurement.

2. Data transformation

5) PREVENTING DIRECT AND IN DIRECT DISCRIMINATION

Discriminatory item sets (i.e., A) did not exist in the original database DB or have previously been removed from it due to privacy constraints or for preventing discrimination. However, if background knowledge from publicly available data (e.g., census data) is available, indirect discrimination remains possible. In fact, in this case, only PND rules are extracted from DB so only indirect discrimination could happen.

At least one discriminatory item set (i.e., A) is not removed from the original database (DB). So it is clear that PD rules could be extracted from DB and direct discrimination could happen. However, in addition to direct discrimination, indirect discrimination might occur because of background knowledge obtained from DB itself due to the existence of nondiscriminatory items that are highly correlated with the sensitive (discriminatory) ones. Hence, in this case both direct and indirect discrimination could happen.

To provide both direct rule protection (DRP) and indirect rule protection (IRP) at the same time, an important point is the relation between the data transformation methods. Any data transformation to eliminate direct α discriminatory rules should not produce new redlining rules or prevent the existing ones from being removed. Also any data transformation to eliminate redlining rules should not produce new direct α discriminatory rules or prevent the existing ones from being removed.

6) DIRECT AND INDIRECT PREVENTION ALGORITHM

Construct the above data transformation method and to implementing the prevention algorithm. This algorithm used to prevent simultaneously direct and indirect discrimination at the same time. The algorithm starts

with redlining rules and discriminatory rules. Algorithm based on the rule protection and rule generalization methods

If some rules can be extracted from DB as both direct and indirect α discriminatory rules, it means that there is overlap between MR and RR, in such case, data transformation is performed until both the direct and the indirect rule protection requirements are satisfied. This is possible because, the same data transformation method (Method 2 consisting of changing the class item) can provide both DRP and IRP. However, if there is no overlap between MR and RR, the data transformation is performed according to Method 2 for IRP, until the indirect discrimination prevention requirement is satisfied for each indirect α discriminatory rule ensuing from each redlining rule in RR.

7) **MEASURE THE COMPUTATIONAL COST AND PREVENTION DEGREE:**

The final stage is compute the computational cost and utility measurement.

To measure discrimination removal, four metrics were used:

1. Direct discrimination prevention degree (DDPD).
2. Direct discrimination protection preservation(DDPP)
3. Indirect discrimination prevention degree (IDPD).
4. Indirect discrimination protection preservation(IDPP)

Since the above measures are used to evaluate the success of the proposed method in direct and indirect discrimination prevention, ideally their value should be 100 percent. To measure data quality, we use two metrics proposed in the literature as information loss measures in the context of rule hiding for privacy-preserving data mining (PPDM).

V. CONCLUSION

Along on the privacy, discrimination are an indistinguishable authoritative effect while believing the eligible and right looks from data mining. It is more than noticeable that most people do not want to be discriminated since by their sex, religion, nationality, age, and soon, especially when those attributes are applied as constructing conclusions around it alike applying it an job, loan, policy, etc . The aim of theses paper was to develop a new pre processing discrimination prevention methodology including different data transformation methods that can prevent direct discrimination indirect discrimination or both of them at them at the same time. To attain this objective, the first step is measure discrimination and identify categories and groups of individuals that have been directly and indirect discriminated in decision making process. The second step is to transform data in proper way to remove all those discrimination biases finally, discriminationfree data models can be produced from the transformed data set without seriously damaging data quality.

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