"NEW APPROACH FOR PREVENTING DISCRIMINATION ON SENSITIVE DATA USING DATA MINING"

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ABSTRACT: *The aim of data mining is to extract useful information, such as patterns and trends, from large amounts of data. Many governments are gathering large amounts of data to gain insight into methods and activities of suspects and potential suspects. This can be very useful, but usually at least part of the data on which data mining is applied is confidential and privacy sensitive. In many cases, an information system is used for decision making tasks. There are several decision-making tasks which lend themselves to discrimination, e.g. loan granting, education, health insurances and staff selection. Data mining can be both a source of discrimination and a means for discovering discrimination. Discrimination can be either direct or indirect. Direct discrimination consists of rules or procedures that obviously mention minority or disadvantaged groups based on sensitive discriminatory attributes related to group membership. Indirect discrimination consists of rules or procedures that, while not explicitly mentioning discriminatory attributes, intentionally or un-intentionally could generate discriminatory decisions. For example refusing to grant mortgages or insurances in urban areas they consider as deteriorating is a typical example of indirect discrimination, although certainly not the only one. In this paper going to presenting the system for preventing the data.*

Keywords: Discrimination,. Direct discrimination, indirect discrimination

1. INTRODUCTION

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.

2. RELATED WORK

P.Yuvasri et. al. [1] proposed a sensitive 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.

Vaibhav P Sonawane et. al. [2] deal with discrimination avoidance in data mining and proposed novel method for discrimination prevention with the post processing approach. We projected Classification based on predictive association rules (CPAR) algorithm, which is a kind of association classification methods. The algorithm combines the advantages of both association classification methods and traditional rule based classification. The algorithm used to thwart discrimination deterrence in post processing. We calculate the utility of the proposed approach and compare with the existing approaches. The experimental assessment proved that the proposed method is effectively removing the direct or unintended discrimination prejudices in the original data set for maintaining the quality of data.

Supriya Kadam et. al [3] modifies original data in order to prevent discrimination that results into extraction of discrimination free rules after mining process. This approach consists of discrimination discovery and data transformation as major step. It deals with implementation of direct rule protection algorithm and aims at analyzing the effect of extended lift. The qualitative analysis of the modified data is done by extracting classification rules from modified data and comparing its value of discrimination measure with threshold value to ensure removal of discrimination from the original data.

Faisal Kamiran et. al. [4] study discrimination-aware classification when applied to a real world dataset of Statistics Netherlands, which is a census body in the Netherlands. Specifically, author considers the use of classifiers for predicting whether an individual is a crime suspect, or not, to support law enforcement and security agencies' decision making. Results show that discrimination does exist in real world datasets and blind use of classifiers learned over such datasets can exacerbate the discrimination problem and demonstrate that discrimination-aware classification methods

can mitigate the discriminatory effects and that they lead to rational and legally acceptable decisions.

3. PROBLEM DEFINITIONS

During the investigation of literature survey, some issues were identified and are summarized using the following points:

• The methods focus on the attempt to detect discrimination in the original data only for one discriminatory item and also based on a single measure

• They do not include any measure to evaluate how much discrimination has been removed and how much information loss has been incurred.

• It focuses either on direct discrimination or indirect discrimination or not on both together.

• The approaches do not shows any measure to evaluate how much discrimination has been removed, and thus do not concentrate on the amount of information loss generated.

So the proposed work in data mining proposes pre-processing methods which overcome the above limitations. And introduces new data transformation methods (rule protection and rule generalization (RG)) are based on measures for both direct and indirect discrimination and can deal with several discriminatory items.

4. SYSTEM ARCHITECTURE

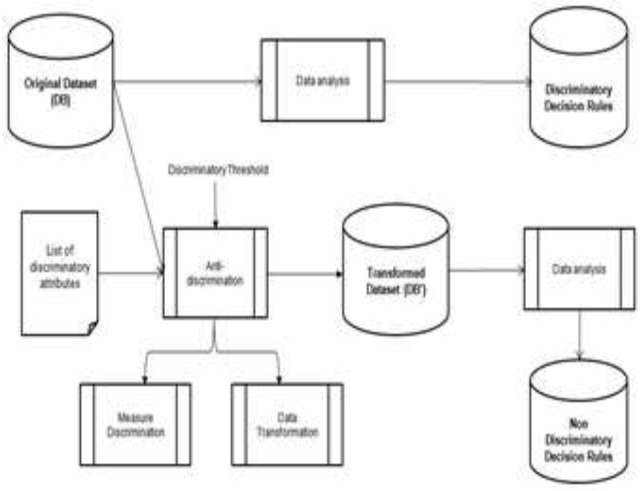

Figure.2 illustrates the process of discriminatory and non-discriminatory decision rule extraction. If the original biased dataset DB is used for data analysis without any anti-discrimination process (i.e. discrimination discovery and prevention), the discriminatory rules extracted could lead to automated unfair decisions. On the contrary, DB can go through an anti-discrimination process so that the learned rules are free of discrimination, given a list of discriminatory attributes (e.g. gender, race, age, etc.). As a result, fair and legitimate automated decisions are enabled.

5. ALGORITHM FOR DIRECT AND INDIRECT DISCRIMINATION METHODOLOGY

Steps:

1) Perform Preprocessing to clean the data sets.

• Select data sets, store into database.

• Create cluster of data and delete row which having garbage values.

• Shows the data value which pre process.

2) Identify sensitive and non sensitive data attributes.

• Find the support of sensitive attributes.

```
Support = Occurance / Total support
Call procedure support()
malecour();
femalecour();
d=(float)a/(float)c;
e=(float)b/(float)c;
write(d);
write(e);
return(d);
```

Above step calculate the support of attribute gender.maleoccur() and femaleoccur() function find the occurrence of male and female from datasets. then it call function support to calculate support gender.

3) Calculate confidence of all sensitive and non sensitive attributes.

```
1) call procedure Confisex()
        {
           r1=(float)e/(float)d;//confidencce of male -> female
          write("confisex);
           return(r1);
        }
```

Above procedure calculate the confidence of male and female. Same as calculate the confidence of other attributes.

4) Calculate the utility of measures lift and ulift to check the data quality of direct and indirect discrimination.

```
e20=(float)e18/e17;//support sensitive attributes
e21=(float)e19/e16;//support non sensitive attributes
e23= e20+e21;  //bn7
e31=e24+e25+e26+e27+e28+e29+e30;
```

q3=d+e+q+r+s+d1+e1+q1[k];
e32=e16+e17+e18+e19;//bn4
e39=e38+e37;//bn8
e40=(float)e17/e18;//bn9
e45=e41+e42+e43+e44;
elift=(el1+el2+e13+e14+e15)/e23;//elift calculation to measure quality of data

Above step calculate the measures an according to it generates results.

6. REFERENCES

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