SYSTEM AND METHOD FOR ADAPTIVELY TRACKING A PATTERN OF A TRANSACTION

[0001] The present invention relates generally to payment technology and, in particular, to a system and method for adaptively tracking a pattern of a transaction initiated by a transaction request.

Background

[0002] With some companies, aggregates for fraud prevention from the attackers using different payment instruments are used to detect lost or stolen cards for illicit earnings. Aggregates are used in different models to detect anomalies and decline potential fraud transactions. The aggregates are also used in rules to set hard limits on different data points to reduce finance loss. Rules are of the format - decline a transaction if the user has already done 100 transactions in the last 30 days, or if the user has done transactions to 100 different merchants in the last one week.

[0003] Conventionally, aggregates and rules are evaluated during each transaction. The aggregates are expected to be evaluated with least latency and minimal network and memory overload. Therefore, there is a need to ameliorate one or more of the above problems.

Summary

[0004] According to a first aspect of the present disclosure, there is provided a method for adaptively tracking a pattern of a transaction initiated by a transaction request, the transaction request including at least one data, the method comprising: querying, by a transaction processing module from a database, predetermined data corresponding to one or more features and/or combinations of features for a plurality of time periods; wherein the predetermined data is determined from historical transactions conducted over a period of time by the user; determining, by the transaction processing module, that data from the transaction request corresponds to a feature or combination of said one or more features and/or combinations of features; updating, by a payment monitoring module, distinct counts for the feature or combination by: decreasing a distinct count for the feature or combination for a time period corresponding to the last historical transaction data; and increasing a distinct count for the

feature or combination for a time period corresponding to the transaction request; and adaptively tracking, by the payment monitoring module, a spending pattern of a user in response to an outcome of the determination of the data from transaction request.

[0005] According to a second aspect of the present disclosure, there is provided a server for adaptively tracking a pattern of a transaction initiated by a transaction request, the server comprising: at least one processor; and at least one memory including computer program code; the at least

one memory and the computer program code configured to, with the at least one processor, cause the server at least to: query, by a transaction processing module from a database, predetermined data corresponding to one or more features and/or combinations of features for a plurality of time periods; wherein the predetermined data is determined from historical transactions conducted over a period of time by the user; determine, by the transaction processing module, that data from the transaction request corresponds to a feature or combination of said one or more features and/or combinations of features; updating, by a payment monitoring module, distinct counts for the feature or combination by: decreasing a distinct count for the feature or combination for a time period corresponding to the last historical transaction data; and increasing a distinct count for the feature or combination for a time period corresponding to the transaction request; and adaptively tracking, by the payment monitoring module, a pattern of a transaction in response to an outcome of the determination of the data from transaction request.

[0005a] The invention according to the above aspects advantageously provides the exact distinct count-based aggregates, in constant time without actually loading or scanning through the distinct values.

Brief Description of the Drawings

[0006] Embodiments and implementations are provided by way of example only, and will be better understood and readily apparent to one of ordinary skill in the art from the following written description, read in conjunction with the drawings, in which:

[0007] Fig. 1 is a block diagram of a system for managing a transaction in accordance with an aspect of the present disclosure.

[0008] Fig. 2 is a flow chart diagram of a method for adaptively tracking a pattern of a transaction initiated by a transaction request by the transaction processing server in the system of Fig. 1.

[0009] Fig. 3 shows a flow chart diagram of a sub-process in relation to historical transaction data in the method of Fig. 2.

[0010] Fig. 4 shows a flow chart diagram of a sub-process of the method of Fig. 2.

[0011] Fig 5a shows how aggregates are maintained for transactions for (user and merchant) and (user) as composite keys at day level and Fig 5b shows aggregates are updated for (user and merchant) and (user) as composite keys at day level shown in Fig 5a.

[0012] Fig. 6 shows a topographical view of features that are used to define the order of updates for multiple aggregates for a transaction.

[0013] Figs. 7 and 8 form a schematic block diagram of a computer system upon which a transaction processing server in the system of Fig. 1 can be practiced

CLAIMS:

1. A computer-implemented method for adaptively tracking a pattern of a transaction initiated by a transaction request, the transaction request including at least one data, the method comprising:

   querying, by a transaction processing module from a database, predetermined data corresponding to one or more features and/or combinations of features for a plurality of time periods; wherein the predetermined data is determined from historical transactions conducted over a period of time by the user;

   determining, by the transaction processing module, that data from the transaction request corresponds to a feature or combination of said one or more features and/or combinations of features;

   updating, by a payment monitoring module, distinct counts for the feature or combination by:

      decreasing a distinct count for the feature or combination for a time period corresponding to the last historical transaction data; and

      increasing a distinct count for the feature or combination for a time period corresponding to the transaction request;

   and

   adaptively tracking, by the payment monitoring module, a spending pattern of a user in response to an outcome of the determination of the data from transaction request.

2. The method according claim 1, further comprising:
   obtaining, by the transaction processing module, historical transaction data relating to historical transactions that were conducted over the period of time by the user; and

calculating the distinct count of the predetermined data based on the obtained historical transaction data.

3. The method according to any one of the above claims, further comprising: determining, by the transaction processing module, a type of transaction based on the transaction request.

4. The method according to claim 3, where the type of transaction indicates that a further predetermined data is to be used for determining if data from the transaction request corresponds to the predetermined data.

5. The method according to claim 4, further comprising:
ranking, by the payment monitoring module, the predetermined data and the further predetermined data to determine an order of updating a respective distinct count of the predetermined data and the further predetermined data.

6. The method according to any one of the preceding claims, further comprising identifying, by the transaction processing module, at least one of a user information or a merchant information, wherein the step of determining if data from the transaction request corresponds to the predetermined data is performed based on the at least one of the user information or the merchant information.

7. A server for adaptively tracking a pattern of a transaction initiated by a transaction request, the server comprising: at least one processor; and at least one memory including computer program code; the at least one memory and the computer program code configured to, with the at least one processor, cause the server at least to:

query, by a transaction processing module from a database, predetermined data corresponding to one or more features and/or combinations of features for a plurality of time periods; wherein the predetermined data is determined from historical transactions conducted over a period of time by the user;

determine, by the transaction processing module, that data from the transaction request corresponds to the a feature or combination of said one or more features and/or combinations of features;

updating, by a payment monitoring module, distinct counts for the feature or combination by:

decreasing a distinct count for the feature or combination for a time period corresponding to the last historical transaction data; and

increasing a distinct count for the feature or combination for a time period corresponding to the transaction request;

and

adaptively tracking, by the payment monitoring module, a pattern of a transaction in response to an outcome of the determination of the data from transaction request.

8. The server according to claim 7, wherein the at least one memory and the computer program code is further configured with the at least one processor to:

obtain, by the payment monitoring module, historical transaction data relating to historical transactions that were conducted over the period of time by the user; and

calculate, by the payment monitoring module, the distinct count of the predetermined data based on the obtained historical transaction data.

9. The server according to any one of claims 7-8, wherein the at least one memory and the computer program code is further configured with the at least one processor to determine a type of transaction based on the transaction request.

10. The server according to any one of claims 9, where the type of transaction indicates that a further predetermined data is to be used for determining if data from the transaction request corresponds to the predetermined data.