

[CLAIMS]

We claim that:

~~{Claim 1}~~

1. An apparatus for deriving a social relation between accounts based on a transaction ledger, characterized in that the apparatus comprises:

a data storage unit storing account information, software for deriving an inter-account social relation, and inter-account social relation information; and

a processor deriving the inter-account social relation based on ~~the~~ transaction ledger generated by transactions among users with the accounts and performing construction of a social media service based on the accounts by using the derived inter-account social relation and data processing and transmission/reception for supporting community activities among respective accounts,

wherein

the account includes a blockchain address,

the processor is configured to calculate a value scale of each account from the derived social relation, and the data storage unit further stores the calculated value scale and an account value scale calculating software,

the processor is configured to calculate a weighted centrality of each account for calculating the value scale of the account in the inter-account social relation derived based on the transaction ledger generated by the transactions among the users with the accounts,

the processor is configured to calculate a weighted centrality scale of the corresponding account by using a local weight factor determined for a random account and a weight centrality scale factor of a neighborhood account having the social relation with the corresponding account,

the weighted centrality becomes a value acquired by adding a value acquired by reflecting a self ratio to the local weight

of the corresponding node corresponding to the random account and a value acquired by reflecting an external factor ratio without the self ratio to each sum of values acquired by dividing the weighed centrality of each node by the number of adjacent nodes to the corresponding node corresponding to the random account,

the self ratio is a parameter for reflecting, in calculating the weighted centrality of one node, a self factor of the corresponding node, and

the processor is configured to calculate the weighted centrality of each account by the following equation:

$$\text{WC(A)} = \text{LW(A)} * \text{sr} + (1 - \text{sr}) * (\text{WC(N1)} / \text{NH(N1)} + \dots + \text{WC(Nn)} / \text{NH(Nn)})$$

where

WC represents a weighted centrality,

WC(A) represents a weighted centrality of node A,

LW represents a local weight,

LW(A) represents a local weight of node A,

sr represents a self ratio,

WC(N1) represents a weighted centrality of first neighborhood node N1 of node A,

WC(Nn) represents a weighted centrality of n-th neighborhood nodes Nn of A,

NH represent a number of neighborhood,

NH(N1) represents a number of neighborhood nodes of first neighborhood N1 of node A, and

NH(Nn) represents a number of neighborhood nodes of n-th neighborhood node Nn of node A.

{Claim 2}

~~The apparatus of claim 1, wherein the account includes a blockchain address.~~

{Claim 3}

2. The apparatus of claim 1, wherein the processor derives the inter-account social relation by using transaction information between the accounts.

~~{Claim 4}~~

3. The apparatus of claim ~~1~~2, wherein the transaction information includes at least one of transaction information between ~~the~~a corresponding account and another account and a transaction frequency with the other account.

~~{Claim 5}~~

~~— The apparatus of claim 1, wherein the processor calculates a value scale of each account from the derived social relation, and~~

~~— the data storage unit further stores the calculated value scale.~~

~~_ {Claim 6}~~

~~— The apparatus of claim 5, wherein the processors calculates the value scale of the account by using at least one of a weighted centrality scale, amount information of the corresponding account, change ratio information, and a level of identity verification information.~~

~~{Claim 7}~~

~~— The apparatus of claim 6, wherein the data storage unit stores the account information, inter-account social relation deriving and account value scale calculating software, the inter-account social relation information, and the calculated value scale information of the account,~~

~~— the processor calculates a weighted centrality of each account for calculating the value scale of the account in the inter-account social relation derived based on the transaction ledger generated by the transactions among the users with the accounts,~~

~~— the processor calculates a weighted centrality scale of the corresponding account by using a local weight factor determined for a random account and a weight centrality scale factor of a~~

~~neighborhood account having the social relation with the corresponding account,~~

~~the weighted centrality becomes a value acquired by adding a value acquired by reflecting the self ratio to the local weight of the corresponding node corresponding the random account and a value acquired by reflecting an external factor ratio without the self ratio to each sum of values acquired by dividing the weighted centrality of each node by the number of adjacent nodes to the corresponding node corresponding to the random account, a self ratio is a parameter for reflecting, in calculating the weighted centrality of one node, a self factor of the corresponding node, and~~

~~the processor calculates the weighted centrality of each account by the following equation.~~

~~$$WC(A) = LW(A) * sr + (1 - sr) * (WC(N1) / NH(N1) + \dots + WC(Nn) / NH(Nn))$$~~

~~(however, WC represents the weighted centrality, WC(A) represents the weighted centrality of node A, LW represents a local weight, LW(A) represents the local weight of node A, sr represents a self ratio, WC(N1) represents the weighted centrality of first neighborhood node N1 of node A, WC(Nn) represents the weighted centrality of n-th neighborhood node Nn of node A, NH represents the number of neighborhood nodes, NH(N1) represents the number of neighborhood nodes of first neighborhood node N1 of node A, and NH(Nn) represents the number of neighborhood nodes of n-th neighborhood node Nn of node A)~~
~~{Claim 8}~~

4. The apparatus of claim 71, wherein the processor calculates the weighted centrality scale so that a sum of the weighted centrality scales of the respective accounts converges to ~~the~~ sum of local weights of the respective accounts.

~~{Claim 9}~~

5. The apparatus of claim 71, wherein the local weight factor for the random account is determined as an independent

value from the neighborhood account having the social relation with the corresponding account.

~~{Claim 10}~~

6. The apparatus of claim 95, wherein the processor calculates the local weight of the corresponding account by applying predetermined weights to the weighted centrality scale, ~~the size of amount, the level of identity verification, and the change ratio~~ the amount information of the corresponding account, the change ratio information, and the level of identity verification information which are calculated.

~~{Claim 11}~~

7. The apparatus of claim 95, wherein the processor calculates the local weight of each account by the following equation.

$$LW = SA * NH * (100\% - CR) * LV$$

LW: Local Weight

SA: Size of Amt

NH : # of neighborhood addresses

CR : Change Ratio

LV : Level of Identity Verification

~~{Claim 12}~~

8. The apparatus of claim 51, wherein the value scale includes a value evaluation scale by evaluation, a score scale, or a grade scale.

~~{Claim 13}~~

9. The apparatus of claim 51, wherein the processor expresses the value scale by a plurality of badge images or a plurality of character images according to an importance, a utilization pattern, or characteristics of the account.

~~{Claim 14}~~

10. The apparatus of claim 139, wherein the characteristics of the account include at least one of a transaction size, a transaction frequency, a size of amount, and a transaction item.

~~{Claim 15}~~

11. The apparatus of claim 1, wherein the processor provides the derived inter-account social relation to a social media service providing apparatus so as to be linked with a social media account.

~~{Claim 16}~~

12. A method for deriving a social relation between accounts based on a transaction ledger, characterized in that the method comprising:

acquiring transaction information for a random account based on a transaction ledger generated by transactions among users with the accounts including a blockchain address,

deriving a social relation between respective accounts based on the acquired transaction information, ~~and~~

performing construction of a social media service based on the accounts by using the derived social relation between the respective accounts and data processing and transmission/reception for supporting community activities among the respective accounts,

calculating a value scale of each account from the derived social relation,

calculating a weighted centrality of each account for calculating the value scale of the account in the inter-account social relation derived based on the transaction ledger generated by the transactions among the users with the accounts,

calculating a weighted centrality scale of the corresponding account by using a local weight factor determined for a random account and a weight centrality scale factor of a neighborhood account having the social relation with the corresponding account, wherein the weighted centrality becomes a value acquired by adding a value acquired by reflecting a self ratio to the local weight of the corresponding node corresponding to the random account and a value acquired by reflecting an external factor ratio without the self ratio to

each sum of values acquired by dividing the weighted centrality of each node by the number of adjacent nodes to the corresponding node corresponding to the random account, wherein the self ratio is a parameter for reflecting, in calculating the weighted centrality of one node, a self factor of the corresponding node, and

calculating the weighted centrality of each account by the following equation:

$$\underline{WC(A) = LW(A) * sr + (1 - sr) * (WC(N1) / NH(N1) + \dots + WC(Nn) / NH(Nn))}$$

where

WC represents a weighted centrality,

WC(A) represents a weighted centrality of node A,

LW represents a local weight,

LW(A) represents a local weight of node A,

sr represents a self ratio,

WC(N1) represents a weighted centrality of first neighborhood node N1 of node A,

WC(Nn) represents a weighted centrality of n-th neighborhood node Nn of node A,

NH represents a number of neighborhood nodes,

NH(N1) represents a number of neighborhood nodes of first neighborhood node N1 of node A, and

NH(Nn) represents a number of neighborhood nodes of n-th neighborhood node NH of node A

~~{Claim 17}~~

~~— The method of claim 16, further comprising:~~

~~— calculating a value scale of each account from the derived social relation.~~

~~{Claim 18}~~

~~— The method of claim 17, wherein the calculating of the~~

~~value scale includes~~

~~—calculating the weighted centrality scale, the size of amount, the level of identity verification, and the change ratio based on the acquired transaction information, and~~

~~—calculating a value scale of the corresponding account by applying predetermined weights to the weighted centrality scale, the size of amount, the level of identity verification, and the change ratio which are calculated.~~

~~{Claim 19}~~

~~—An apparatus for providing a social media service using a social relation between accounts based on a transaction ledger, the apparatus comprising:~~

~~—a data storage unit storing account information, inter-account social relation information, and social media service information; and~~

~~—a processor enabling transactions among users with the accounts based on the account information, deriving a social relation between respective accounts based on a transaction ledger generated by the transactions, and performing construction of a social media service based on the accounts by using the derived social relation between the respective accounts and the social media service information and data processing and transmission/reception for supporting community activities among the respective accounts.~~

~~{Claim 20}~~

~~—A method for providing a social media service using a social relation between accounts based on a transaction ledger, the method comprising:~~

~~—inquiring, by a social media service providing apparatus, social relation information between respective accounts, which is derived based on a transaction ledger generated by transactions among users with accounts; and~~

~~—performing, by the social media service providing apparatus, construction of a social media service based on the~~

~~accounts by using the inquired social relation information of the account and prestored social media service information and data processing and transmission/reception for supporting community activities among respective accounts.~~