

Claims

1. A computer implemented method of identifying a network access behavior, comprising:
 - obtaining network access information of a user within a preset time period;
 - extracting behavior data of the user in each preset behavior class according to the network access information;
 - calculating a behavior entropy of the user according to the behavior data of the user in each preset behavior class, wherein the behavior entropy characterizes a degree of dispersion of the network access behavior of the user; and
 - determining an access class to which the network access behavior of the user belongs according to the behavior entropy; wherein the network access information comprises a login time of the user within the preset time period; and calculating the behavior entropy of the user according to the behavior data of the user in each preset behavior class comprises:
 - calculating a degree of dispersion of the login time of the user;
 - determining a first behavior entropy weight value of the user according to the degree of dispersion of the login time of the user; and
 - determining a new behavior entropy of the user according to the first behavior entropy weight value and the behavior entropy.
2. The computer implemented method of claim 1, wherein extracting the behavior data of the user in each preset behavior class according to the network access information comprises:
 - preprocessing the network access information; and
 - obtaining the behavior data of the user in each preset behavior class according to the preprocessed network access information, so that the obtained behavior data of the same class has the same format.
3. The computer implemented method of claim 1, wherein calculating the behavior entropy of the user according to the behavior data of the user in each preset behavior

class comprises:

calculating a statistical number and a total number of each corresponding preset behavior class according to the behavior data of the user in each preset behavior class, the total number being a sum of the statistical numbers of the each preset behavior class; calculating a class probability corresponding to each preset behavior class according to the statistical number and the total number of the each preset behavior class; calculating a class entropy corresponding to the each preset behavior class according to the class probability of the each preset behavior class, wherein the class entropy characterizes the degree of dispersion of the network access behavior of the user in a corresponding class; and calculating the behavior entropy according to the class entropy of the each preset behavior class.

4. The computer implemented method of claim 3, wherein a calculation formula of the class entropy is:

$P_i = a \cdot p_i \log_b(p_i)$, wherein P_i represents a class entropy of class i behavior, a is any coefficient that is not 0, b is a coefficient greater than 0, p_i represents a probability of the class behavior of class i relative to the total number;

the behavior entropy being a sum of the class entropy of each preset behavior class.

5. The computer implemented method of claim 1, wherein a plurality of ages is set as sensitive ages, and the network access information comprises an age of the user; and wherein

calculating the behavior entropy of the user according to the behavior data of the user in each preset behavior class comprises:

determining whether or not the age of the user is one of the sensitive ages, if yes, then obtaining a second behavior entropy weight value corresponding to the sensitive age; and wherein the

new behavior entropy of the user is determined according to the second behavior entropy weight value, first behavior entropy weight value and the behavior entropy.

6. A device of identifying a network access behavior, comprising:

- a network access information obtainment module configured to obtain network access information of a user within a preset time period;

- a behavior data obtainment module configured to extract behavior data of the user in each preset behavior class according to the network access information;

- a behavior entropy calculation module configured to calculate a behavior entropy of the user according to the behavior data of the user in each preset behavior class, wherein the behavior entropy characterizes a degree of dispersion of the network access behavior of the user; and

- an access class determination module configured to determine an access class to which the network access behavior of the user belongs according to the behavior entropy;

- wherein the network access information comprises a login time of the user within the preset time period; and

the behavior entropy calculation module is further configured to:

- calculate a degree of dispersion of the login time of the user;

- determine a first behavior entropy weight value of the user according to the degree of dispersion of the login time of the user; and

- determine a new behavior entropy of the user according to the first behavior entropy weight value and the behavior entropy.

7. The device of claim 6, wherein the behavior data obtainment module is further configured to:

- preprocess the network access information; and

- obtain the behavior data of the user in each preset behavior class according to the preprocessed network access information, so that the obtained behavior data of the same class has the same format.

8. A server, comprising:

a processor; and a memory having instructions stored thereon, the instructions, when executed by the processor, cause the processor to perform operations comprising:

obtaining network access information of a user within a preset time period;

extracting behavior data of the user in each preset behavior class according to the network access information;

calculating a behavior entropy of the user according to the behavior data of the user in each preset behavior class, wherein the behavior entropy characterizes a degree of dispersion of the network access behavior of the user; and

determining an access class to which the network access behavior of the user belongs according to the behavior entropy; wherein the network access information comprises a login time of the user within the preset time period, and

calculating the behavior entropy of the user according to the behavior data of the user in each preset behavior class by the processor further comprises:

calculating a degree of dispersion of the login time of the user;

determining a first behavior entropy weight value of the user according to the degree of dispersion of the login time of the user; and

determining a new behavior entropy of the user according to the first behavior entropy weight value and the behavior entropy.

9. The server of claim 8, wherein extracting the behavior data of the user in each preset behavior class according to the network access information performed by the processor comprises:

preprocessing the network access information; and

obtaining the behavior data of the user in each preset behavior class according to the preprocessed network access information, so that the obtained behavior data of the same class has the same format.

10. The server of claim 8, wherein calculating the behavior entropy of the user according to the behavior data of the user in each preset behavior class performed by

the processor comprises:

calculating a statistical number and a total number of each corresponding preset behavior class according to the behavior data of the user in each preset behavior class, wherein the total number being a sum of the statistical number of the each preset behavior class;

calculating a class probability corresponding to the each preset behavior class according to the statistical number and the total number of the each preset behavior class; and

calculating a class entropy corresponding to the each preset behavior class according to the class probability of the each preset behavior class, wherein the class entropy characterizes the degree of dispersion of the network access behavior of the user in a corresponding class; and

calculating the behavior entropy according to the class entropy of the each preset behavior class.

11. The server of claim 10, wherein a calculation formula of the class entropy is:

$P_i = a \cdot p_i \log_b(p_i)$, wherein P_i represents a class entropy of class i behavior, a is any coefficient that is not 0, b is a coefficient greater than 0, p_i represents a probability of the class behavior of class i relative to the total number;

the behavior entropy being a sum of the class entropy of each preset behavior class.

12. The server of claim 8, wherein a plurality of ages is set as sensitive ages, and the network access information comprises age of the user; and wherein

calculating the behavior entropy of the user according to the behavior data of the user in each preset behavior class performed by the processor comprises:

determining whether or not the age of the user is one of the sensitive ages, if yes, then obtaining a second behavior entropy weight value corresponding to the sensitive age; and wherein

the new behavior entropy of the user is determined according to the second behavior entropy weight value, the first behavior entropy weight value and the behavior entropy.

13. One or more non-transitory computer readable storage medium storing computer executable instructions that, when executed by the one or more processors, cause the one or more processors to perform the steps of:

obtaining network access information of a user within a preset time period;

extracting behavior data of the user in each preset behavior class according to the network access information;

calculating a behavior entropy of the user according to the behavior data of the user in each preset behavior class, wherein the behavior entropy characterizes a degree of dispersion of the network access behavior of the user; and

determining an access class to which the network access behavior of the user belongs according to the behavior entropy; wherein the network access information comprises a login time of the user within the preset time period; and calculating the behavior entropy of the user according to the behavior data of the user in each preset behavior class performed by the processor comprises:

calculating a degree of dispersion of the login time of the user;

determining a first behavior entropy weight value of the user according to the degree of dispersion of the login time of the user; and

determining a new behavior entropy of the user according to the first behavior entropy weight value and the behavior entropy.

14. The non-transitory computer readable storage medium of claim 13, wherein extracting the behavior data of the user in each preset behavior class according to the network access information performed by the processor comprises:

preprocessing the network access information; and

obtaining the behavior data of the user in each preset behavior class according to the preprocessed network access information, so that the obtained behavior data of the same class has the same format.

15. The non-transitory computer readable storage medium of claim 13, wherein

calculating the behavior entropy of the user according to the behavior data of the user in each preset behavior class performed by the processor comprises:

calculating a statistical number and a total number of each corresponding preset behavior class according to the behavior data of the user in each preset behavior class, wherein the total number being a sum of the statistical number of the each preset behavior class;

calculating a class probability corresponding to the each preset behavior class according to the statistical number and the total number of the each preset behavior class; and

calculating a class entropy corresponding to the each preset behavior class according to the class probability of the each preset behavior class, wherein the class entropy characterizes the degree of dispersion of the network access behavior of the user in a corresponding class; and

calculating the behavior entropy according to the class entropy of the each preset behavior class.

16. The non-transitory computer readable storage medium of claim 17, wherein a calculation formula of the class entropy is:

$P_i = a \cdot p_i \log_b(p_i)$, wherein P_i represents a class entropy of class i behavior, a is any coefficient that is not 0, b is a coefficient greater than 0, p_i represents a probability of the class behavior of class i relative to the total number;

the behavior entropy being a sum of the class entropy of each preset behavior class.

17. The non-transitory computer readable storage medium of claim 15, wherein a plurality of ages is set as sensitive ages, and the network access information comprises age of the user; and wherein

calculating the behavior entropy of the user according to the behavior data of the user in each preset behavior class performed by the processor comprises:

determining whether or not the age of the user is one of the sensitive ages, if yes, then obtaining a second behavior entropy weight value corresponding to the sensitive age;

and

wherein the new behavior entropy of the user is determined according to the second behavior entropy weight value, the first behavior entropy weight value and the behavior entropy.

18. A computer implemented method of identifying a network access behavior, comprising:

obtaining network access information of a user within a preset time period;

extracting a behavior data of the user in each preset behavior class according to the network access information;

calculating a behavior entropy of the user according to the behavior data of the user in each preset behavior class, wherein the behavior entropy characterizes a degree of dispersion the network access behavior of the user; and

determining an access class to which the network access behavior of the user belongs according to the behavior entropy; wherein a plurality of ages is set as sensitive ages, and the network access information comprises an age of the user, and wherein calculating the behavior entropy of the user according to the behavior data of the user in each preset behavior class comprises:

determining whether or not the age of the user is one of the sensitive ages, if yes, then

obtaining a second behavior entropy weight value corresponding to the sensitive age; and

determining a new behavior entropy of the user according to the second behavior entropy weight value, and the behavior entropy.

19. A server, comprising:

a processor; and a memory having instructions stored thereon, the instructions, when executed by the processor, cause the processor to perform operations comprising:

obtaining network access information of a user within a preset time period;

extracting a behavior data of the user in each preset behavior class according to the network access information;

calculating a behavior entropy of the user according to the behavior data of the user in each preset behavior class, wherein the behavior entropy characterizes a degree of dispersion of the network access behavior of the user; and

determining an access class to which the network access behavior of the user belongs according to the behavior entropy; wherein a plurality of ages is set as sensitive ages, and the network access information comprises age of the user; and wherein calculating the behavior entropy of the user according to the behavior data of the user in each preset behavior class performed by the processor comprises:

determining whether or not the age of the user is one of the sensitive ages, if yes, then

obtaining a second behavior entropy weight value corresponding to the sensitive age; and

determining a new behavior entropy of the user according to the second behavior entropy weight value and the behavior entropy.

20. One or more non-transitory computer readable storage medium storing computer executable instructions that, when executed by the one or more processors, cause the one or more processors to perform the steps of:

obtaining network access information of a user within a preset time period;

extracting a behavior data of the user in each preset behavior class according to the network access information;

calculating a behavior entropy of the user according to the behavior data of the user in each preset behavior class, wherein the behavior entropy characterizes a degree of dispersion of the network access behavior of the user; and

determining an access class to which the network access behavior of the user belongs according to the behavior entropy; wherein a plurality of ages is set as sensitive ages, and the network access information comprises age of the user, and wherein calculating the behavior entropy of the user according to the behavior data of the user in each preset behavior class performed by the processor comprises:

determining whether or not the age of the user is one of the sensitive ages, if yes, then

obtaining a second behavior entropy weight value corresponding to the sensitive age; and

determining a new behavior entropy of the user according to the second behavior entropy weight value and the behavior entropy.