

CLAIMS

1. A human-machine input operation identification method, comprising:

when a loan input operation is detected on a mobile terminal, determining on the basis of a built-in coordinate system of the mobile terminal whether the mobile terminal is located within a preset coordinate range;

when the mobile terminal is located within the preset coordinate range, obtaining input data corresponding to the loan input operation, taking the input data as target input data and using same; and

when the mobile terminal is not located within the preset coordinate range, identifying the input operation corresponding to a loan request as a machine operation behavior;

wherein the input data comprises a contact area between a finger and a touch screen of the mobile terminal, a contact profile between the finger and the touch screen of the mobile terminal, and an input pressure value during user input; and

the step of obtaining input data corresponding to the loan input operation, taking the input data as target input data and using same comprises:

obtaining the input data corresponding to the loan input operation, normalizing the input data, and taking the normalized input data as normalized data;

obtaining a pre-stored target model constructed on the basis of a BP neural network, and taking the normalized data as an input vector of the target model to obtain an output vector; and

when the output vector is located within a preset range, taking the input data as the target input data and using same.

2. The human-machine input operation identification method according to claim 1, wherein the step of determining on the basis of a built-in coordinate system of the mobile terminal whether the mobile terminal is located within a preset coordinate range comprises:

recording rotation angles of the mobile terminal in different directions by using an angle array value, wherein the built-in coordinate system comprises an X axis, a Y axis, and a Z axis, wherein pointing directions of the X axis, the Y axis, and the Z axis of the built-in coordinate system are fixed, a direction perpendicular to the ground is taken as a Z-axis direction of the mobile terminal, a rotation angle of the mobile terminal along the Z axis is used for describing a rotation direction of the device in a horizontal plane, in the case that the mobile terminal is placed on a table, the Z-axis direction points from the mobile terminal to

the sky, an X-axis direction is from left to right along a horizontal direction of a screen of the mobile terminal, and a Y-axis direction points from the lower left corner of the screen to the top end of the screen along a vertical direction of the screen, and three variables, that is, a first angle value, a second angle value, and a third angle value, respectively represent the rotation angle of the mobile terminal around the Z axis, an inclined angle of the mobile terminal around the X axis, and a roll angle of the mobile terminal around the Y axis; and

when a value range of the first angle value is 0° to 90° , a value range of the second angle value is -180° to 0° , and a value range of the third angle value is -45° to 45° , determining that the mobile terminal is located within the preset coordinate range.

3. The human-machine input operation identification method according to claim 1, wherein the step of obtaining the input data corresponding to the loan input operation, and normalizing the input data comprises: obtaining the input data corresponding to the loan input operation, and converting the input data into parameter values that can be identified by a computer; and

obtaining a maximum value and a minimum value in all the parameter values, subtracting the minimum value from each of the parameter values to obtain a positive parameter value, obtaining a difference between the maximum value and the minimum value, and dividing each positive parameter value by the difference to obtain a normalized positive parameter value.

4. The human-machine input operation identification method according to claim 1, wherein the input data comprises a time attribute of the loan input operation; and the step of obtaining input data corresponding to the loan input operation, taking the input data as target input data and using same comprises:

obtaining a minimum time slot between different loan input operations on the basis of the time attributes of the different loan input operations; and

when the minimum time slot is greater than a first preset duration, obtaining the input data corresponding to the loan input operations, taking the input data as the target input data and using same.

5. The human-machine input operation identification method according to claim 4, wherein after the step of obtaining a time slot between different loan input operations, the method comprises:

when the minimum time slot is less than the first preset duration, obtaining the number of loan input operations within a second preset duration, wherein the second preset duration is greater than the first preset duration; and

when the number of loan input operations is greater than a preset number, discarding the input data and not using same.

6. The human-machine input operation identification method according to claim 1, wherein after the step of when the mobile terminal is not located within the preset coordinate range, identifying the input operation corresponding to the loan request as a machine operation behavior, the method comprises:

obtaining a mobile terminal ID number corresponding to the machine operation behavior, and prohibiting, within a third preset duration, receiving the loan request sent by the mobile terminal corresponding to the ID number.

7. A human-machine input operation identification apparatus, comprising:

a determination module, configured to, when a loan input operation is detected on a mobile terminal, determine on the basis of a built-in coordinate system of the mobile terminal whether the mobile terminal is located within a preset coordinate range;

a first obtaining module, configured to, when the mobile terminal is located within the preset coordinate range, obtain input data corresponding to the loan input operation, take the input data as target input data and use same; and

an identification module, configured to, when the mobile terminal is not located within the preset coordinate range, identify the input operation corresponding to a loan request as a machine operation behavior;

wherein the input data comprises a contact area between a finger and a touch screen of the mobile terminal, a contact profile between the finger and the touch screen of the mobile terminal, and an input pressure value during user input; and

the first obtaining module further includes:

a second obtaining unit configured to obtain the input data corresponding to the loan input operation, normalizing the input data, and take the normalized input data as normalized data;

a third obtaining unit configured to obtain a pre-stored target model constructed on the basis of a BP neural network, and take the normalized data as an input vector of the target model to obtain an output vector; and

a first using unit configured to, when the output vector is located within a preset range, take the input data as the target input data and use same.

8. A human-machine input operation identification device, comprising: a memory, a processor, a communication bus, and a human-machine input operation identification program stored on the memory, wherein

the communication bus is configured to implement communication connection between the processor and the memory; and

the processor is configured to execute the human-machine input operation identification program, so as to implement steps of the human-machine input operation identification method according to claim 1.

9. A human-machine input operation identification device, comprising: a memory, a processor, a communication bus, and a human-machine input operation identification program stored on the memory, wherein

the communication bus is configured to implement communication connection between the processor and the memory; and

the processor is configured to execute the human-machine input operation identification program, so as to implement steps of the human-machine input operation identification method according to claim 2.

10. A human-machine input operation identification device, comprising: a memory, a processor, a communication bus, and a human-machine input operation identification program stored on the memory, wherein

the communication bus is configured to implement communication connection between the processor and the memory; and

the processor is configured to execute the human-machine input operation identification program, so as to implement steps of the human-machine input operation identification method according to claim 3.

11. A human-machine input operation identification device, comprising: a memory, a processor, a communication bus, and a human-machine input operation identification program stored on the memory, wherein

the communication bus is configured to implement communication connection between the processor and the memory; and

the processor is configured to execute the human-machine input operation identification program, so as to implement steps of the human-machine input operation identification method according to claim 4.

12. A readable storage medium, having a human-machine input operation identification program stored thereon, wherein when the human-machine input operation identification program is executed by a processor, steps of the human-machine input operation identification method according to claim 1 are performed.

13. A readable storage medium, having a human-machine input operation identification program stored thereon, wherein when the human-machine input operation identification program is executed by a processor, steps of the human-machine input operation identification method according to claim 2 are performed.

14. A readable storage medium, having a human-machine input operation identification program stored thereon, wherein when the human-machine input operation identification program is executed by a processor, steps of the human-machine input operation identification method according to claim 3 are performed.

15. A readable storage medium, having a human-machine input operation identification program stored thereon, wherein when the human-machine input operation identification program is executed by a processor, steps of the human-machine input operation identification method according to claim 4 are performed.

16. A readable storage medium, having a human-machine input operation identification program stored thereon, wherein when the human-machine input operation identification program is executed by a processor, steps of the human-machine input operation identification method according to claim 5 are performed.