SPEECH TRANSACTION PROCESSING

CROSS-REFERENCES TO RELATED APPLICATIONS

[0001] The present application claims priority to U.S. Non-Provisional Application No. 14/304,681, entitled "SPEECH TRANSACTION PROCESSING", filed on JUNE 13, 2014 (Attorney Docket No.: 79900-906869), which claims benefit to to U.S. Provisional Application No. 61/835,992, entitled "SPEECH TRANSACTION PROCESSING", filed on JUNE 17, 2013 (Attorney Docket No.: 79900-876103), the entire contents of which are herein incorporated by reference for all purposes.

BACKGROUND

[0002] Embodiments of the invention are directed to systems and methods that allow for user verification at point-of-sale (POS) terminals. A number of instances exist where a user may wish to complete a transaction with their mobile device at a point-of-sale terminal. In some cases, verification of the user may be accomplished by, e.g., the use of a personal identification number (PIN) assigned to the user. However, PINs are often comprised. As such, the effectiveness of PINs as a security safeguard and for user verification is greatly reduced. Additionally the user's trust and comfort with the verification system may be diminished as a result.

[0003] Embodiments of the invention address this and other problems, both individually and collectively.

SUMMARY

[0004] Embodiments of the invention are directed to systems and methods for authenticating a user for a transaction. More specifically, embodiments of the invention relate to systems and methods for determining when a user is within a specified location and obtaining a reference for accessing a voice model associated with the user from a database. The reference to the voice model may then be used to authenticate the user by comparing a received voice segment to the voice model. Because a user's voice and speech patterns can be unique to the user, it would be difficult for a fraudster to mimic someone else's voice to fraudulently conduct a transaction. As such, utilizing a user's voice to authenticate the user for a transaction

can provide better security than other authentication techniques such as PINs that can easily be compromised.

[0005] Some aspects of the invention relate to techniques for increasing efficiency in searching databases. In some embodiments, these databases may store voice models for a plurality of users that can be used for voice authentication during initiation of a transaction. These databases can include thousands or millions of entries, which may take a significant amount of time to search. Upon the occurrence of an event, e.g. a user entering a merchant location, a reference to the voice model associated with the user that is stored within the database can be obtained. The reference can be a pointer to a location of the voice model within the database. The user can be identified based on attributes associated with his/her communication device (e.g., serial number, International Mobile Equipment Identity (IMEI) number, Subscriber Identity Module (SIM) card number, phone number, primary account number or token associated with a digital wallet application, etc.). The user may provide a voice segment (e.g., voice sample) at the time of initiating a transaction via the communication device. The provided voice segment may then be compared against the voice model associated with the user stored within the database, using the obtained reference. These techniques may eliminate or reduce the need or the time it takes to search the entire database(s) for the user's voice model at the point of transaction, as a reference to the voice model may have already been obtained at the occurrence of the event (e.g., the user entering the merchant location).

[0006] According to a first aspect of the present invention, there is provided a method of authenticating a user for a transaction, the method comprising: receiving, at a server computer, a communication indicative of a communication device associated with the user entering a location within a virtual perimeter; in response to receiving the communication and prior to receiving a voice segment from the user, retrieving, via the server computer, a reference for accessing a voice model associated with the user, wherein the voice model is stored in a database; using the reference to access the voice model stored in the database; receiving, at the server computer, a voice segment from the user; comparing the received voice segment to the voice model; and determining whether the user is authenticated for the transaction based at least in part on comparing the received voice segment to the voice model.

[0007] According to a second aspect of the present invention, there is provided a server computer, comprising: a processor; and a non-transitory computer-readable storage medium, comprising code executable by the processor for implementing a method for authenticating a user for a transaction, the method comprising: receiving a communication indicative of a communication device associated with the user entering a location within a virtual perimeter; in response to receiving the communication and prior to receiving a voice segment from the user, retrieving a reference for accessing a voice model associated with the user, wherein the voice model is stored in a database; using the reference to access the voice model stored in the database; receiving a voice segment from the user; comparing the received voice segment to the voice model; and determining whether the user is authenticated for the transaction based at least in part on comparing the received voice segment to the voice model.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] **FIG. 1** is a block diagram of a payment system, according to some embodiments.

[0009] **FIG. 2** is a block diagram of communication device, according to some embodiments.

[0010] **FIG. 3** is a block diagram of server computer, according to some embodiments.

[0011] **FIG. 4** illustrates an exemplary environment including a merchant location, according to some embodiments.

[0012] **FIG. 5** illustrates a block diagram of accessing voice model within a voice database using reference, according to some embodiments.

[0013] **FIG. 6** shows an exemplary voice database including a voice model, according to some embodiments.

[0014] **FIG. 7** illustrates a flow diagram of an exemplary method for authenticating a user for a transaction, according to some embodiments.

[0015] **FIG. 8** shows a block diagram of an exemplary computer apparatus, according to some embodiments.

CLAIMS

1. A method of authenticating a user for a transaction, the method comprising:

receiving, at a server computer, a communication indicative of a communication device associated with the user entering a location within a virtual perimeter;

in response to receiving the communication and prior to receiving a voice segment from the user, retrieving, via the server computer, a reference for accessing a voice model associated with the user, wherein the voice model is stored in a database;

using the reference to access the voice model stored in the database;

receiving, at the server computer, a voice segment from the user;

comparing the received voice segment to the voice model; and

determining whether the user is authenticated for the transaction based at least in part on comparing the received voice segment to the voice model.

2. The method of claim 1, wherein the database is a first database, the method further comprising:

using the reference, copying the voice model from the first database to a second database, wherein the voice model being compared with the received voice segment is retrieved from the second database.

3. The method of claim 1, wherein the comparing step further comprises determining a match score based at least in part on the comparison.

4. The method of claim 1, wherein the virtual perimeter is established around a merchant location.

5. The method of claim 1, wherein the reference is a pointer to a storage address within the database.

6. The method of claim 1, further comprising updating the voice model with the received voice segment.

7. The method of claim 1, wherein the communication indicative of a location of a communication device associated with the user originates from the communication device.

8. The method of claim 1, wherein the voice model is based on a plurality of voice segments previously received from the user.

9. The method of claim 1, further comprising:

calculating a match score based at least in part on comparing the received voice segment to the voice model; and

approving or declining the transaction based on the match score.

10. A server computer, comprising:

a processor; and

a non-transitory computer-readable storage medium, comprising code executable by the processor for implementing a method for authenticating a user for a transaction, the method comprising:

receiving a communication indicative of a communication device associated with the user entering a location within a virtual perimeter;

in response to receiving the communication and prior to receiving a voice segment from the user, retrieving a reference for accessing a voice model associated with the user, wherein the voice model is stored in a database;

using the reference to access the voice model stored in the database;

receiving a voice segment from the user;

comparing the received voice segment to the voice model; and

determining whether the user is authenticated for the transaction based at least in part on comparing the received voice segment to the voice model.

11. The server computer of claim 10, wherein the database is a first database, the method further comprising:

using the reference, copying the voice model from the first database to a second database, wherein the voice model being compared with the received voice segment is retrieved from the second database.

12. The server computer of claim 10, wherein the comparing step further comprises determining a match score based at least in part on the comparison.

13. The server computer of claim 10, wherein the virtual perimeter is established around a merchant location.

14. The server computer of claim 10, wherein the reference is a pointer to a storage address within the database.

15. The server computer of claim 10, further comprising updating the voice model with the received voice segment.

16. The server computer of claim 10, wherein the communication indicative of a location of a communication device associated with the user originates from the communication device.

17. The server computer of claim 10, wherein the voice model is based on a plurality of voice segments previously received from the user.

18. The server computer of claim 10, further comprising:

calculating a match score based at least in part on comparing the received voice segment to the voice model; and

approving or declining the transaction based on the match score.