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] ~~Some embodiments are~~ A first aspect of the invention is directed to a method for authenticating a user for a transaction. The method includes receiving, at a server computer, a communication indicative of a location of a communication device associated with the user. The method also includes, in response to receiving the communication, 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. The method further includes receiving, at the server computer, a voice segment from the

user. The method additionally includes, using the reference to access the voice model stored in the database. The method also includes comparing the received voice segment to the voice model. The method further includes 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] ~~Some embodiments~~ A second aspect of the invention ~~are~~is directed to a server computer comprising a processor, and a non-transitory computer readable storage medium, ~~coupled to the processor. The computer readable medium comprises~~ comprising code, executable by the processor, for implementing ~~the above-described~~ a method for authenticating a user for a transaction, the method comprising: receiving a communication indicative of a location of a communication device associated with the user; in response to receiving the communication, retrieving a reference for accessing a voice model associated with the user, wherein the voice model is stored in a database; receiving a voice segment from the user; using the reference to access the voice model stored in the database; 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.