METHODS AND SYSTEMS FOR PROVIDING A HANDS-FREE CARDLESS PAYMENT TRANSACTION

TECHNICAL FIELD

[0001] The present disclosure relates to payment transactions and, more particularly to, methods and systems for providing a hands-free cardless payment transaction.

BACKGROUND

[0002] Generally, payment cards are commonly used by many users for payment transactions of goods/services. For the card-based payment transactions, the users may be required to carry one or more payment cards. Further, with advancement in digital technology, cardless payment transactions have also gained popularity among the users. The cardless payment transactions may be performed using payment applications, virtual payment cards, digital wallets, or the like.

[0003] However, there may be times that some of the users may find difficulty in performing the card-based payment transactions. For instance, it may be inconvenient for a user to carry more than one payment card with them. The user may also find difficulty in remembering a password for each of the payment card. There may also be times that some of the users may find difficult to manually operate the payment applications for the card-based or the cardless payment transactions. For instance, the user may have a severe injury in their hand(s), or the user may be differently abled from others. This may restrict the user from performing the manual operation of the card-based or cardless payment transactions. The manual operation may include swiping a payment card, entering a PIN in a merchant terminal, opening a payment application in the user device, entering a password in the payment application, providing a fingerprint, etc. Moreover, the user may be required to install one or more payment applications in a user device, such as a smartphone, a tablet or the like for the cardless payment transactions, which may be cumbersome to the user. In such cases, the user may opt to pay by cash. However, carrying a huge amount of cash may entail risk of loss or theft. At such times, these users may desire for a hands-free alternative payment transaction.

[0004] Accordingly, there is a need to obviate disadvantages of the above-mentioned problems and facilitate a technique where users can perform a hands-free payment transaction without need for the manual operation.

SUMMARY

[0005] Various embodiments of the present disclosure provide systems, methods, electronic devices and computer program products for providing a hands-free cardless payment transaction.

[0006] In an embodiment, a computer-implemented method is disclosed. The method includes establishing, by a processor of a wearable payment device of a user, a wireless connection via a short-range communication channel between the wearable payment device and a merchant terminal. The wearable payment device includes information corresponding to a payment card of the user. Upon successful establishment of the wireless connection, The method includes by the processor, transmitting the information corresponding to the payment card from the wearable payment device to the merchant terminal via a magnetic secure transmission. The transmitted information enables the merchant terminal to display details of the payment card thereon. The method includes receiving, by the processor, a user voice input from the user in the wearable payment device. The user voice input is an input for authentication of a payment transaction of a payment amount by the payment card. The method further includes transmitting, by the processor, the user voice input to the merchant terminal via the wireless connection for authenticating the payment transaction.

[0007] In another embodiment, a wearable payment device is disclosed. The wearable payment device includes a communication interface configured to establish a wireless connection via a short-range communication channel between the wearable payment device and a merchant terminal. The wearable payment device includes a memory storing executable instructions and configured to store information corresponding to a payment card of the user. The wearable payment device further includes a processor communicably coupled to the communication interface. The processor is configured to

execute the instructions to cause the wearable payment device to at least transmit the information corresponding to the payment card to the merchant terminal via a magnetic secure transmission upon successful establishment of the wireless connection. The transmitted information enables the merchant terminal to display details of the payment card thereon. The wearable payment device is further caused to receive a user voice input from the user in the wearable payment device. The user voice input is an input for authentication of a payment transaction of a payment amount by the payment card. The wearable payment device is further caused to transmit the user voice input to the merchant terminal via the wireless connection for authenticating the payment transaction.

[0008] In yet another embodiment, a computer-implemented method is disclosed. The method includes establishing, by a processing module of a merchant terminal, a wireless connection via a short-range communication channel between the merchant terminal and a wearable payment device of a user. The wearable payment device includes information corresponding to a payment card of the user. The method includes upon successful establishment of the wireless connection, receiving, by the processing module, the information corresponding to the payment card transmitted from the wearable payment device via a magnetic secure transmission. The transmitted information of the payment card is displayed thereon. The method includes receiving, by the processing module, a user voice input and an auxiliary authentication data of the user provided by the wearable payment device via the wireless connection for authentication of a payment transaction of a payment amount by the payment card. The auxiliary authentication data includes a combination of at least a combination of at least a latitudinal data corresponding to a current location of the user and a longitudinal data corresponding to the current location of the user. The method further includes sending, by the processing module, a payment transaction request to a payment server via an acquirer server. The payment transaction request includes the information corresponding to the payment card, the payment amount, the user voice input and the auxiliary authentication data.

[0009] Other aspects and example embodiments are provided in the drawings and the detailed description that follows.

BRIEF DESCRIPTION OF THE FIGURES

[0010] For a more complete understanding of example embodiments of the present technology, reference is now made to the following descriptions taken in connection with the accompanying drawings in which:

[0011] FIG. 1 illustrates an example representation of an environment related to least some example embodiments of the present disclosure;

[0012] FIG. 2 is a flow chart of providing a hands-free cardless payment transaction using a wearable payment device, in accordance with an example embodiment;

[0013] FIG. 3 represents a sequence flow diagram of establishing a wireless connection via a Bluetooth channel between a wearable payment device and a merchant terminal, in accordance with an example embodiment;

[0014] FIG. 4 represents a sequence flow diagram of transmitting information corresponding to a payment card from the wearable payment device to the merchant terminal via a magnetic secure transmission upon successful establishment of the wireless connection, in accordance with an example embodiment;

[0015] FIG. 5 represents a sequence flow diagram of transmitting user voice input and auxiliary authentication data for authenticating a payment transaction, in accordance with an example embodiment;

[0016] FIG. 6 represents a sequence flow diagram of authenticating a payment transaction by the payment server using the user voice input and the auxiliary authentication data is represented in accordance with an example embodiment;

[0017] FIG. 7 illustrates a representation of a user performing a setup of the wearable payment device, in accordance with an example embodiment;

[0018] FIG. 8 represents a sequence flow diagram of facilitating generation of a trained dataset based on a pre-recorded user voice input of the user, one or more voice features of the user and a height data of the of the wearable payment device, in accordance with an example embodiment;

[0019] FIG. 9 is a flow diagram depicting a method for providing a hands-free cardless payment transaction, in accordance with an example embodiment;

[0020] FIG. 10 illustrates a flow diagram depicting a method for providing a hands-free cardless payment transaction, in accordance with another example embodiment;

[0021] FIG. 11 represents a simplified block diagram of the wearable payment device for providing a hands-free cardless payment transaction, in accordance with an example embodiment;

[0022] FIG. 12 is a simplified block diagram of a merchant terminal for providing the hands-free cardless payment transaction, in accordance with an embodiment of the present disclosure;

[0023] FIG. 13 is a simplified block diagram of an acquirer server, in accordance with an embodiment of the present disclosure; and

[0024] FIG. 14 is a simplified block diagram of a payment server, in accordance with an embodiment of the present disclosure.

[0025] The drawings referred to in this description are not to be understood as being drawn to scale except if specifically noted, and such drawings are only exemplary in nature.

DETAILED DESCRIPTION

[0026] In the following description, for purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding of the present disclosure. It will be apparent, however, to one skilled in the art that the present disclosure can be practiced without these specific details.

[0027] Reference in this specification to "one embodiment" or "an embodiment" means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment of the present disclosure. The appearance of the phrase "in an embodiment" in various places in the specification are not necessarily all referring to the same embodiment, nor are separate or alternative

embodiments mutually exclusive of other embodiments. Moreover, various features are described which may be exhibited by some embodiments and not by others. Similarly, various requirements are described which may be requirements for some embodiments but not for other embodiments.

[0028] Moreover, although the following description contains many specifics for the purposes of illustration, anyone skilled in the art will appreciate that many variations and/or alterations to said details are within the scope of the present disclosure. Similarly, although many of the features of the present disclosure are described in terms of each other, or in conjunction with each other, one skilled in the art will appreciate that many of these features can be provided independently of other features. Accordingly, this description of the present disclosure is set forth without any loss of generality to, and without imposing limitations upon, the present disclosure.

[0029] The term "payment account" used throughout the description refers to a financial account that is used to fund the financial transaction (interchangeably referred to as "payment transaction"). Examples of the payment account include, but are not limited to a savings account, a credit account, a checking account and a virtual payment account. The payment account may be associated with an entity such as an individual person, a family, a commercial entity, a company, a corporation, a governmental entity, a non-profit organization and the like. In some scenarios, a payment account may be a virtual or temporary payment account that can be mapped or linked to a primary payment account, such as those accounts managed by PayPal®, and the like.

[0030] The term "payment card", used throughout the description, refers to a physical or virtual card linked with a financial or payment account that may be presented to a merchant or any such facility in order to fund a financial transaction via the associated payment account. Examples of the payment card include, but are not limited to, debit cards, credit cards, prepaid cards, virtual payment numbers, virtual card numbers, forex cards, charge cards, e-wallet cards, and stored-value cards. A payment card may be a physical card that may be presented to the merchant for funding the payment. Alternatively or additionally, the payment card may be embodied in form of data stored in a user device, where the data is associated with payment account such that the data can be used to process the financial transaction between the payment account and a merchant's financial account.

[0031] The term "payment network", used throughout the description, refers to a network or collection of systems used for transfer of funds through use of cash-substitutes. Payment networks may use a variety of different protocols and procedures in order to process the transfer of money for various types of transactions. Transactions that may be performed via a payment network may include product or service purchases, credit purchases, debit transactions, fund transfers, account withdrawals, etc. Payment networks may be configured to perform transactions via cash-substitutes, which may include payment cards, letters of credit, checks, financial accounts, etc. Examples of networks or systems configured to perform as payment networks include those operated by MasterCard®, VISA®, Discover®, American Express®, etc.

OVERVIEW

[0032] Various example embodiments of the present disclosure provide methods, systems and electronic devices for performing a hands-free cardless payment transaction in an efficient, feasible and secure manner by using a wearable payment device.

[0033] In an example scenario, a user may purchase goods/services from a merchant. A wearable payment device is present with the user. The wearable payment device includes information corresponding to a payment card of the user. In at least an example embodiment, a wireless connection via a short-range communication channel is established between the wearable payment device and a merchant terminal. The wearable payment device searches for a merchant terminal within a pre-defined proximity range (for example, 3-5 meters) of the wearable payment device. When the wearable payment device is searching for the merchant terminal, an identification key is identified and displayed on the merchant terminal. The merchant terminal sends a request to the wearable payment device to confirm the identified identification key. The wearable payment device receives the request and determines a match between the identified identification key and an identification key associated with the wearable payment device. In case the identified identification key is not matching with the identification key, then the user provides the identification key to the merchant. The merchant manually enters the identification key in the merchant terminal.

[0034] After confirming the identification key, the wireless connection via the short-range communication channel is successfully established between the wearable payment

device and the merchant terminal. Activation of the wireless connection is indicated to the user by at least emitting an LED of the wearable payment device and/or playing a pre-recorded audio in the wearable payment device for a pre-defined time period. For instance, the wireless connection is indicated by blinking a red color LED and playing a beep tone (or an audio logo) for 10 seconds. Further, the wearable payment device transmits a connection signal to the merchant terminal for the pre-defined time period (*e.g.,* 10 seconds). The connection signal transmission for 10 seconds allows the merchant terminal to determine an intent of the user for a payment transaction. After determining the intent, the merchant generates a purchase bill for the user. The merchant provides a payment amount corresponding to the purchase bill in the merchant terminal for the payment transaction. The payment amount is notified to the user. The user provides a voice-based approval command in the wearable payment device that corresponds to an approval of the payment amount. The wearable payment device includes a built-in recognition function to recognize the voice-based approval command. For example, the user approves the payment amount of $50 by saying "OK", "APPROVE", or the like to the wearable payment device.

[0035] Further, the voice-based approval command triggers transmission of the information corresponding to the payment card to the merchant terminal via a magnetic secure transmission. The transmitted information enables the merchant terminal to display details of the payment card. The details of the payment card may be notified to the user. The user provides a user voice input in the wearable payment device. The wearable payment device transmits the user voice input to the merchant terminal via the wireless connection. The user voice input is provided as an input for authentication of the payment transaction. When the user voice input is transmitted, the wearable payment device also transmits an auxiliary authentication data to the merchant terminal via the wireless connection. The auxiliary authentication data includes a combination of at least a latitudinal data of a current location the user and a longitudinal data of the current location of the user. The latitudinal data and the longitudinal data provide key information for avoiding any frauds. The wearable payment device accesses the auxiliary authentication data provided by one or more sensors.

[0036] Further, the user voice input and the auxiliary authentication data are transmitted to the payment server via an acquirer server. In an example embodiment, the merchant terminal sends a payment transaction request to the payment server via the acquirer

server. The payment transaction request includes the information corresponding to the payment card, the payment amount, the user voice input and the auxiliary authentication data. The payment server authenticates the payment transaction using the user voice input and the auxiliary authentication data. The authentication includes determining a match between a voice of the user voice input and a voice of a pre-recorded user voice input of a user, a voice pitch of the user voice input and a voice pitch of the pre-recorded user voice input and a voice decibel of the user voice input and a voice decibel of the pre-recorded user voice input. In one example embodiment, the authentication of the payment transaction includes determining a match between the user voice input and a pre-recorded voice input by a payment server. The determination includes determining a match between a voice of the user voice input and a voice of the pre-recorded user voice input, determining a match between a voice pitch of the user voice input and a voice pitch of the pre-recorded user voice input and determining a match between a voice decibel of the user voice input and a voice decibel of the pre-recorded user voice input. The authentication further includes verifying the auxiliary authentication data based on location data of the user at a location of a merchant. The location data includes at least a combination of a latitudinal data corresponding to a current location of the merchant terminal and a longitudinal data corresponding to the current location of the merchant terminal. The location data is provided to the payment server by the merchant terminal for verifying the auxiliary authentication data.

[0037] The wearable payment device also performs a pre-recording of the user voice input during a setup by the user. During the setup, the wearable payment device learns one or more voice features of the user from the pre-recorded user voice input to recognize the user voice input in different circumstances. The one or more voice features includes at least a voice of the user, a voice pitch of the user and a voice decibel of the user. Further, the wearable payment device learns a height data of the wearable payment device from ground level when worn by the user. The height data is learnt according to an attachment of the wearable payment device on the user so as to enhance security. Thus, the height data is used for verifying the user of the wearable payment device. In an illustrative example scenario, if a user A wears a wearable payment device of user B, then a flag is alerted in the wearable payment device as height (H_A) of the wearable payment device when worn by the user A differs from the height (H_B) of the wearable payment device when worn by the user B. The

pre-recorded user voice input, the one or more voice features and the height data are sent to the payment server. The payment server generates a trained dataset based on the pre-recorded user voice input, the one or more voice features and the height data. The trained dataset is updated based on successful completion of the payment transaction. The updated trained dataset is provided to the wearable payment device so as to improve the voice recognition of the user.

[0038] Therefore, the user can perform a hands-free cardless payment transaction using the wearable payment device in a secure manner. The methods and systems for providing the cardless payment transaction using the wearable payment device, are further explained in detail with reference to FIGS. 1 to 14.

[0039] FIG. 1 illustrates an example representation of an environment 100 related to at least some example embodiments of the present disclosure. The environment 100 is depicted to include a user, such as a user 102. The user 102 attaches a wearable payment device, such as a wearable payment device 104. The wearable payment device 104 can be used by the user 102 in different ways to provide a hands-free payment transaction. For example, some users may attach the wearable payment device on an ear as a headphone, a wrist band, on an eyewear, or any other accessories of the user. In some cases, the wearable payment device is capable of connecting with other wearable electronic devices of the user 102. For instance, the user 102 may wear a pair of Bluetooth headphones (not shown) that can be connected to the wearable payment device 104 via a wireless connection. The user 102 may operate the wearable payment device 104 using the pair of headphones. Further, the wearable payment device 104 stores information corresponding to a payment card of the user 102. In at least an example embodiment, the information corresponding to a payment card of the user 102 may be embedded in the wearable payment device 104 during a fabrication process.

[0040] In an illustrative example scenario, a user 102 attaches a wearable payment device 104 as a headphone. The user 102 visits a merchant facility, such as a merchant facility 110. The merchant facility 110 includes, but not limited to, a shopping mall, a departmental store, a grocery shop, a retail store, or a business service provider. The merchant facility 110 is depicted to include merchants, such as a merchant 106 associated with a merchant terminal 108. The user 102 is standing in a queue at a merchant counter for

making a payment of a purchase from the merchant facility 110. As the user 102 approaches the merchant 106, the wearable payment device 104 searches for a merchant terminal, such as the merchant terminal 108.

[0041] In an example embodiment, the wearable payment device 104 establishes a wireless connection via a short-range communication channel between the wearable payment device 104 and the merchant terminal 108. The short-range communication channel includes, such as but not limited to, a Bluetooth channel, a near-field communication (NFC) channel, infrared channel, Zigbee channel, or the like. For instance, the wireless connection is established via a Bluetooth channel between the wearable payment device 104 and the merchant terminal 108. It shall be noted that the description of the present disclosure is made with respect to the Bluetooth channel being example of the short-range communication channel for exemplary purposes only, and that the present disclosure can be practiced with any other suitable technology of short-range communication channel.

[0042] The wearable payment device 104 searches whether the merchant terminal 108 is within a pre-defined proximity range (*e.g.,* 3 or 4 meters). When the wearable payment device 104 is searching for the merchant terminal 108, an identification key is identified by the merchant terminal 108. The identified identification key is displayed in the merchant terminal 108. Further, the merchant 106 sends a request to the wearable payment device 104 to confirm the identified identification key. The wearable payment device 104 receives the request and determines a match between the identified identification key and an identification key associated with the wearable payment device 104. The confirmation is provided to the merchant terminal 108 based on the determination. In case the identified identification key is not matching, then the identification key of the wearable payment device 104 is manually provided in the merchant terminal 108. For instance, the merchant 106 may request the user 102 to provide the identification key. The user 102 provides the identification key that is manually entered in the merchant terminal 108 by the merchant 106.

[0043] After the confirmation, the wireless connection is successfully established between the wearable payment device 104 and the merchant terminal 108. In an example embodiment, activation of the wireless connection is indicated to the user 102 by at least emitting an LED of the wearable payment device 104 and playing a pre-recorded audio in

the wearable payment device 104 for a pre-defined time period. For instance, the LED (such as a green light, a red light, or the like) blinks or the pre-recorded audio (such as a beep tone, an audio logo, or the like) plays for 10 secs. When the activation is indicated, the wearable payment device 104 transmits a connection signal to the merchant terminal 108 for the pre-defined time period (*i.e.,* 10 secs). The merchant terminal 108 receives the connection signal. This enables the merchant terminal 108 in determining an intent of the user 102 for a payment transaction.

[0044] The merchant 106 generates a purchase bill for the user 102. The merchant 102 enters a payment amount in the merchant terminal 108 based on the purchase bill. The payment amount is notified to the user 102 by the merchant 106. The user 102 provides a voice-based approval command in the wearable payment device 104. The voice-based approval command is provided corresponding to the payment amount. Further, the voice-based approval command triggers a magnetic secure transmission module in the wearable payment device 104. The magnetic secure transmission module transmits the information corresponding to the payment card of the user 102 via a magnetic secure transmission. The magnetic secure transmission emits the information corresponding to the payment card as magnetic signals to the merchant terminal 108. The merchant terminal 108 displays the information corresponding to the payment card. The merchant 106 may notify about the information of the payment card to the user 102.

[0045] The user 102 confirms the notified information of the payment card and provides a user voice input in the wearable payment device 104. The user voice input is provided as an input for authentication of a payment transaction of the payment amount by the payment card. The wearable payment device 104 transmits the user voice input to the merchant terminal 108 via the wireless connection. Further, the wearable payment device 104 accesses an auxiliary authentication data provided by one or more sensors in the wearable payment device 104. The one or more sensors include an accelerometer, a Global Positioning System (GPS) sensor, or the like. The auxiliary authentication data includes a combination of at least a latitudinal data corresponding to a current location of the user 102 and a longitudinal data corresponding to the current location of the user 102. The wearable payment device 104 transmits the auxiliary authentication data to the merchant terminal 108 via the wireless connection.

[0046] The merchant terminal 108 further transmits the user voice input and the auxiliary authentication data to a payment server, such as payment server 112. In an example embodiment, the merchant terminal 108 sends a payment transaction request to the payment server 112 via an acquirer server 114. The payment transaction request includes the information corresponding to the payment card, the payment amount, the user voice input and the auxiliary authentication data. The merchant terminal 108 communicates with the payment server 112 and the acquirer server 114 using a network 116. The network 116 may include wired networks, wireless networks and combinations thereof. Some non-limiting examples of the wired networks may include Ethernet, local area networks (LANs), fiber-optic networks, and the like. Some non-limiting examples of the wireless networks may include cellular networks like GSM/3G/4G/5G/LTE/CDMA networks, wireless LANs, Bluetooth, Wi-Fi or Zigbee networks, and the like. An example of the combination of wired and wireless networks may include the Internet. In some cases, the network 116 may include a payment network (not shown). Examples of payment interchange network include, but not limited to, Mastercard® payment system interchange network. The Mastercard® payment system interchange network is a proprietary communications standard promulgated by Mastercard International Incorporated® for the exchange of financial transaction data between financial institutions that are members of Mastercard International Incorporated®. (Mastercard is a registered trademark of Mastercard International Incorporated located in Purchase, N.Y.).

[0047] In an example embodiment, the payment server 112 authenticates the payment transaction using the user voice input and the auxiliary authentication data. The payment transaction is authenticated based on determining a match between the user voice input and a pre-recorded user voice input in the payment server 112. The determination includes determining a match between a voice of the user voice input and a voice of the pre-recorded user voice input, a match between a voice pitch of the user voice input and a voice pitch of the pre-recorded user voice input and a match between a voice decibel of the user voice input and a voice decibel of the pre-recorded user voice input. Further, the auxiliary authentication data is verified based on a location data of the merchant terminal 108. The location data includes a combination of at least a latitudinal data corresponding to a current location of the merchant terminal 108 and a longitudinal data corresponding to the current location of the merchant terminal 108.

[0048] The pre-recorded user voice input is provided to the payment server 112 by the wearable payment device 104. In an example embodiment, the wearable payment device 104 performs a pre-recording of the user voice input. The pre-recording is performed during a setup of the wearable payment device 104 by the user 102. The wearable payment device 104 learns one or more voice features of the user from the pre-recorded user voice input to recognize the user voice input in different circumstances. The one or more voice features includes at least a voice of the user, a voice pitch of the user and a voice decibel of the user. The wearable payment device 104 learns the pre-recorded user voice input to recognize the user voice input in different circumstances. Further, the wearable payment device 104 learns a height data of the wearable payment device 104 from ground level when attached on the user 102. The height data is used for verifying the user 102 of the wearable payment device 104. This prevents misuse of the wearable payment device 104 by other users and thereby, providing an enhanced security for a hands-free payment transaction to the user 102. The wearable payment device 104 sends the pre-recorded user voice input, the one or more voice features and the height data to the payment server 112. The payment server 112 generates a trained dataset based on the pre-recorded user voice input, the one or more voice features and the height data. Further, the trained dataset is updated based on successful payment transaction of the user 102.

[0049] In an alternative example embodiment, the merchant terminal 108 may include an online merchant terminal (not shown). For instance, the online merchant terminal may be installed in a smart television (TV) (not shown). The smart TV is capable of establishing the wireless connection with the wearable payment device (*e.g.,* the wearable payment device 104) via the Bluetooth channel. Moreover, the smart TV may include a magnetic card reader to read the payment card information transmitted via a magnetic secure transmission. In an illustrative example scenario, the user 102 may perform a payment transaction in the online merchant terminal using the wearable payment device 104. The wearable payment device 104 establishes the wireless connection via the Bluetooth channel with the smart TV. After the establishment, the information corresponding to the payment card in the wearable payment device 104 is transmitted to the smart TV via the magnetic secure transmission. For instance, a payment amount is displayed to the user 102 via the smart TV. The user 102 provides a voice-based approval command to the wearable payment device 104 as an approval to the payment amount. The voice-based approval command

triggers the magnetic secure transmission. Further, the online merchant terminal displays the information corresponding to the payment card in the smart TV. Now, the user 102 provides the user voice input in the wearable payment device 104. The wearable payment device 104 transmits the user voice input to the smart TV via the wireless connection. The wearable payment device 104 also transmits the auxiliary authentication data to the smart TV via the wireless connection. The online merchant terminal sends a payment transaction request that includes the information corresponding to the payment card, the payment amount, the user voice input and the auxiliary authentication data to the payment server (*e.g.,* the payment server 112) via the acquirer server (*e.g.,* the acquirer server 114) using the network (*e.g.,* the network 116). The payment transaction is authenticated by the payment server 112 using the user voice input and the auxiliary authentication data.

[0050] FIG. 2 represents a flow chart depicting a method 200 of providing a hands-free payment transaction using a wearable payment device (*e.g.,* the wearable payment device 104), in accordance with an example embodiment of the present disclosure. In an illustrative example scenario, the user 102 uses the wearable payment device 104 for a payment transaction to the merchant 106. The wearable payment device 104 may be switched on via a voice-based activation command. In an example, the wearable payment device 104 includes a built-in speech recognition function. The built-in speech recognition function allows the user 102 to switch on the wearable payment device 104 via the voice-based activation command. For instance, the voice-based activation command may include 'ACTIVATE', 'TURN ON', 'CONNECT', or the like. In another example, the user 102 may use a switch on/off button in the wearable payment device 104. The method 200 starts at step 202.

[0051] At step 204, the wearable payment device 104 searches whether the merchant terminal 108 (shown in FIG. 1) is within a pre-defined proximity range, such as 3 meters. When distance of the merchant terminal 108 is less than or equal to 3 meters, the wearable payment device 104 detects the merchant terminal 108 and proceeds to step 206. Otherwise, the wearable payment device 104 continues the search. At step 206, the wearable payment device 104 receives a request to confirm an identification key identified by the merchant terminal 108.

[0052] At step 208, the wearable payment device 104 determines whether the

identified identification key is matching with an identification key associated with the wearable payment device 104. In one example embodiment, the match is determined based on a comparison between the identification keys, that is performed internally in the wearable payment device 104. In another example embodiment, the wearable payment device 104 may provide an audio output of the identified identification key to the user 102. The user 102 may listen to the audio output and determine a match between the identified identification key and the identification key. If the identified identification key is matching, then proceed to step 210. In case the identification key is not matching, then go to step 212.

[0053] At step 210, the wearable payment device 104 sends a confirmation to the merchant terminal 108 based on the determination at step 208. At step 212, the identification key is manually provided in the merchant terminal 108. For instance, the user 102 provides the identification key to the merchant 106. The merchant 106 manually enters the identification key in the merchant terminal 108.

[0054] At step 214, a wireless connection via a Bluetooth channel is successfully established between the wireless payment device 104 and the merchant terminal 108. At step 216, activation of the wireless connection via the Bluetooth channel is indicated to the user 102 by at least emitting light by an LED and/or playing a beep tone in the wearable payment device 104 for a pre-defined time period, such as 10 seconds.

[0055] At step 218, the wearable payment device 104 transmits a connection signal to the merchant terminal 108 for the pre-defined time period (*i.e.,* 10 seconds). The merchant terminal 108 understands intent of the user 102 based on the connection signal transmission for 10 seconds.

[0056] At step 220, the wearable payment device 104 receives a voice-based approval command from the user 102 to transmit the information corresponding to the payment card. The voice-based approval command is provided based on approving a payment amount for a purchase bill provided by the merchant 106.

[0057] At step 222, the wearable payment device 104 transmits the information corresponding to the payment card to the merchant terminal 108 via the magnetic secure transmission. The information is transmitted based on triggering a magnetic secure module

in the wearable payment device 104 by the voice-based approval command. In one example embodiment, the information of the payment card is stored as magnetic stripe data. The magnetic stripe data may be stored in an electromagnetic chip that is embedded in the wearable payment device 104. The magnetic stripe data is transmitted as magnetic signals to the merchant terminal 108 via the magnetic secure transmission.

[0058] At step 224, the wearable payment device 104 receives the user voice input provided by the user 102. At step 226, the wearable payment device 104 transmits the user voice input via the wireless connection. At 228, the wearable payment device 104 accesses an auxiliary authentication data provided by one or more sensors, such as accelerometer, GPS sensor, or the like. At 230, the wearable payment device 104 transmits the auxiliary authentication data to the merchant terminal 108 via the wireless connection. At 232, the method 200 ends.

[0059] Some non-exhaustive example embodiments for providing the hands-free payment transaction using the wearable payment device, is described with reference to FIGS. 3 to 14.

[0060] FIG. 3 represents a sequence flow diagram 300 of establishing a wireless connection via a Bluetooth channel between a wearable payment device (*e.g.,* the wearable payment device 104) and a merchant terminal (*e.g.,* the merchant terminal 108), in accordance with an example embodiment of the present disclosure. In an illustrative example scenario, the user 102 switches on the wearable payment device 104 via a voice activation or a switch on/off physical button present in the wearable payment device 104.

[0061] At 302, the wearable payment device 104 searches whether the merchant terminal is within a pre-defined proximity range, such as 3 or 4 meters. In an illustrative example scenario, the merchant terminal 108 within the range of 3 meters is detected by the wearable payment device 104. At 304, the wearable payment device 104 emits a Bluetooth signal to the merchant terminal 108. The merchant terminal 108 identifies an identification key based on the Bluetooth signal.

[0062] During the searching process, the wearable payment device 104 may detect more than one merchant terminal. In an illustrative example scenario, the merchant terminal

108 may be positioned close to another merchant terminal from a neighboring payment counter of the merchant 106. The wearable payment device 104 detects both the merchant terminals. In such scenario, the user 102 may approach or select one of the merchants terminal. In some other cases, the merchant terminal 108 may identify more than one identification key. For instance, the merchant terminal 108 is within 3 meters of three wearable payment devices. The merchant terminal 108 identifies three identification keys, out of which, only one is selected by the merchant 106.

[0063] At 306, the merchant terminal 108 displays the identified identification key to the merchant 106. At 308, the merchant terminal 108 sends a request to the wearable payment device 104 to confirm the identified identification key. At 310, the wearable payment device 104 determines a match between the identified identification key and an identification key associated with the wearable payment device 104.

[0064] At 312, the wearable payment device 104 sends a confirmation to the merchant terminal 108 based on the determination. In case the identified identification key is not matching, then the merchant 106 may check if there is any existing connection of any wearable payment device with the merchant terminal 108. The merchant 106 cancels the existing connection with the merchant terminal 108. Further, the merchant 106 asks the user 102 to provide the identification key of the wearable payment device 104 and enters the identification key manually in the merchant terminal 108.

[0065] At 314, the wireless connection via the Bluetooth channel is successfully established between the wearable payment device 104 and the merchant terminal 108.

[0066] Further, upon successful establishment of the wireless connection, the information corresponding to the payment card is transmitted to the merchant terminal, which is explained next with reference to FIG. 4.

[0067] Referring now to FIG. 4, a sequence flow diagram 400 of transmitting the information corresponding to the payment card upon successful establishment of the wireless connection is shown, in accordance with another example embodiment of the present disclosure.

[0068] At 402, activation of the wireless connection is indicated by at least emitting

an LED and/or playing a beep tone for a pre-defined time period, such as 10 seconds. At 404, the wearable payment device 104 transmits a connection signal to the merchant terminal 108 for the pre-defined time period (*i.e.,* 10 seconds).

[0069] At 406, the merchant terminal 108 determines intent of the user 102 for the payment transaction based on the connection signal transmission. At 408, the merchant enters a payment amount for the payment transaction in the merchant terminal 108.

[0070] At 410, the payment amount is notified to the user 102. In one example embodiment, the merchant 106 the payment amount entered in the merchant terminal 108 is transmitted to the wearable payment device 104 via the wireless connection. The wearable payment device 104 may further provide an audio output of the payment amount to the user 102. In another example embodiment, the merchant 106 may display or verbally notify the payment amount to the user 102.

[0071] At 412, the user 102 provides a voice-based approval command corresponding to the payment amount. The user 102 may provide the voice-based approval command, such as 'OK', 'APPROVE', 'CONFIRM', 'ALRIGHT', 'GO AHEAD', 'PAYMENT AMOUNT APPROVED', or the like. In an example embodiment, the wearable payment device 104 includes a built-in speech recognition function that recognizes the voice-based approval command. Moreover, the voice-based approval command may be preset by the user 102 during a setup of the wearable payment device 104.

[0072] At 414, the magnetic secure transmission is triggered to transmit the information corresponding to the payment card of the user 102 in the wearable payment device 104. At 416, the information corresponding to the payment card of the user 102 is transmitted to the merchant terminal 108 via the magnetic secure transmission.

[0073] At 418, the information corresponding to the payment card is displayed in the merchant terminal 108. At 420, the information corresponding to the payment card is notified to the user 102. For instance, the payment card information displayed in the merchant terminal 108 is shown to the user 102 by the merchant 106.

[0074] After transmitting the information corresponding to the payment card, the user 102 provides a user voice input and an auxiliary authentication data for authenticating

the payment transaction, which is explained next with reference to FIG. 5.

[0075] Referring now to FIG. 5, a sequence flow diagram 500 of transmitting the user voice input and the auxiliary authentication data for authenticating the payment transaction is shown in accordance with an example embodiment of the present disclosure. In an illustrative example scenario, the user 102 checks and confirms the information corresponding to the payment card displayed in the merchant terminal 108.

[0076] At 502, the user 102 provides the user voice input to the wearable payment device 104. For example, the user 102 provides user voice input, such as 'PROCEED', 'START PAYMENT', or the like. A pre-recording of the user voice input is performed during a setup of the wearable payment device 104, which is explained in FIG. 7. In an alternate example embodiment, the user voice input may include a One-Time Password (OTP). The wearable payment device 104 may communicate with the payment server 112 to provide the OTP after the information corresponding to the payment card is transmitted to the merchant terminal 108. The wearable payment device 104 may provide an audio output of the OTP to the user 102. The user 102 listens to the OTP and provides the OTP in the user voice input. Thus, the OTP will be unique for each payment transaction, which enhances safety and security of the hands-free payment transaction.

[0077] At 504, the wearable payment device 104 transmits the user voice input to the merchant terminal 108 via the wireless connection.

[0078] At 506, the wearable payment device 104 accesses an auxiliary authentication data for authentication of the payment transaction. The auxiliary authentication data is provided by one or more sensors of the wearable payment device 104. The auxiliary authentication data includes a combination of at least a latitudinal and longitude data corresponding to a current location of the user. The auxiliary data also includes a height of the wearable payment device 104 from the ground. At 508, the wearable payment device 104 transmits the auxiliary authentication data to the merchant terminal 108 via the wireless connection.

[0079] The user voice input and the auxiliary authentication data are provided to the payment server (*i.e.,* the payment server 112) for the authentication, which is further

explained next with reference to FIG. 6.

[0080] Referring now to FIG. 6, a sequence flow diagram 600 of authenticating the payment transaction by the payment server 112 using the user voice input and the auxiliary authentication data is represented, in accordance with an example embodiment of the present disclosure. In an example embodiment, the user voice input and the auxiliary authentication data are provided to the payment server 112 via the acquirer server 114 by the merchant terminal 108.

[0081] At 602, the merchant terminal 108 sends a payment transaction request to the acquirer server 114. The payment transaction request includes the information corresponding to the payment card, the payment amount, the user voice input and the auxiliary authentication data.

[0082] At 604, the acquirer server 114 sends the payment transaction request along with the information corresponding to the payment card, the payment amount, the user voice input and the auxiliary authentication data to the payment server 112.

[0083] At 606, the merchant terminal 108 accesses a location data provided by one or more sensors of the merchant terminal 108 for verifying the auxiliary authentication data. The location data includes a combination of a latitudinal/longitude of the current location of the merchant terminal.

[0084] At 608, the merchant terminal 108 sends the location data to the acquirer server 114. At 610, the acquirer server 114 sends the location data to the payment server 112.

[0085] At 612, the payment server 112 authenticates the payment transaction using the user voice input and the auxiliary authentication data. At 614, the payment server 112 accesses a pre-recorded user voice input for the authentication. The pre-recorded user voice input is provided to the payment server 112 by the wearable payment device, which is explained in FIG. 8.

[0086] At 616, the payment server 112 determines a match between the user voice input and the pre-recorded user voice input. In at least an example embodiment, the

determination of the match includes determining a match between an audio of the user voice input and an audio of the pre-recorded user voice input respectively, a match between a voice pitch of the user voice input and a voice pitch of the pre-recorded user voice input, and a match between a voice decibel of the user voice input and a voice decibel of the pre-recorded user voice input.

[0087] At 618, the payment server 112 verifies the auxiliary authentication data based on the location data. For instance,

Assuming auxiliary authentication data is as follows:

$$[\text{lat}_{aux}, \text{long}_{aux}] = [41° 24' 12.2" \text{ N}, 2° 10' 26.5" \text{ E}]; \text{ and}$$

the location data of the merchant terminal 108 is as follows:

$$[\text{lat}_{loc}, \text{long}_{loc}] = [41° 22' 12.0" \text{ N } 2°, 10' 26.5" \text{ E}].$$

[0088] Here, the auxiliary authentication data is similar to the location data, which indicates that the user 102 is in correct location of the merchant terminal 108.

[0089] At 620, the payment server 112 sends a notification on authentication status to the acquirer server 114. At 622, the acquirer server 114 further sends the authentication status to the merchant terminal 108.

[0090] In an example embodiment, the wearable payment device (such as the wearable payment device 104) performs a pre-recording of the user voice input during a setup of the wearable payment device by the user (such as the user 102). During the setup, the wearable payment device learns to recognize the user voice input in different circumstances, which is further explained next in FIG. 7.

[0091] Referring now to FIG. 7, a representation 700 depicting the user 102 performing a setup of the wearable payment device 104 is shown, in accordance with an example embodiment of the present disclosure. In an illustrative example scenario, the user 102 performs a setup of the wearable payment device 104. The wearable payment device 104 is turned ON using a switch button 702. In some other case, the wearable payment device 104 is turned on via a voice-based activation command, such as voice-based activation

command 708. The voice-based activation command 708 may include 'OPEN', 'START DEVICE', or the like. Further, the voice-based activation command 708 may be set according to a setting provided by the user 102. In an example embodiment, the user 102 may also set a voice-based approval command, such as voice-based approval command 710 in the wearable payment device 104. The voice-based approval command 710 may include 'OK', 'ALRIGHT', 'FINE', 'TRIGGER', or the like to approve a payment amount for the payment transaction. The voice-based activation command and the voice-based approval command are recognized by the built-in speech recognition function of the wearable payment device 104.

[0092] During the setup, the wearable payment device 104 performs a pre-recording of a user voice input. The pre-recorded user voice input, such as the pre-recorded user voice input 704 includes a word or a series of words to provide an input for authentication of a payment transaction of a payment amount by a payment card of the user 102. For instance, the pre-recorded user voice input 704 may include 'PROCEED', 'START PAYMENT', 'INITIATE PAYMENT PROCESS', or the like. In an illustrative example scenario, the pre-recorded user voice input 704, such as 'PROCEED' is provided via an audio receiver 706 of the wearable payment device 104. The pre-recorded user voice input 704 may be recorded more than one time. For instance, the pre-recorded user voice input 704 'PROCEED' may be recorded three times. Each time the recording is performed, the pre-recorded user voice input 704 may differ.

[0093] In an example embodiment, the wearable payment device 104 learns one or more voice features of the user 102 from the pre-recorded user voice input 704 to recognize the user voice input in different circumstances. The one or more voice features include at least a voice of the user 102, a voice pitch of the user 102 and a voice decibel of the user 102. The voice provides sound/speech of the user 102. The voice pitch provides quality of the sound based on degree of highness or lowness of a tone of the user 102. The voice decibel provides intensity of the voice. The one or more voice features may differ according to the different circumstances. In an illustrative example scenario, the pre-recorded user voice input 704, such as 'PROCEED' may vary depending on time (*i.e.,* day/night), place (*i.e.,* indoor/outdoor), situation (*i.e.,* unwell/well/noisy/noiseless) or emotion (*i.e.,* excited/sad) of the user 102. For instance, when the user 102 is unwell (*e.g.,* having a cold) or the

surrounding is noisy, then the voice, the voice pitch or the voice decibel may be affected. Thus, learning the one or more voice features allows the wearable payment device 104 to recognize the user voice input in different circumstances.

[0094] Further, when the wearable payment device 104 is attached on the user 102, the wearable payment device 104 is elevated to a certain height (H) from ground level. The wearable payment device 104 learns a height data (H) for verifying the user 102. Thus, the wearable payment device 104 is only restricted to the user 102 and no other users can use the wearable payment device 104 as the height data differs from one user to another user. The wearable payment device 104 accesses the height data provided by one or more sensors, such as accelerometer, GPS sensor, or the like. As shown in FIG. 7, the wearable payment device 104 is attached on left-side ear of the user 102. It shall be noted that the wearable payment device 104 attached on the ear is described herein for example purpose. There may be various ways to attach the wearable payment device 104 according to requirement and comfort of the user 102. The wearable payment device 104 learns the height data when attached in different ways on the user 102. For instance, if the wearable payment device 104 is attached on a hand of the user 102, then height data measured from the ground level till the wearable payment device 104 on the hand is learnt.

[0095] After the setup, the wearable payment device 104 sends the pre-recorded user voice input, the one or more voice features and the height data (H) to the payment server 112. This facilitates generation of a trained dataset by the payment server 112, which is shown in FIG. 8.

[0096] Referring now to FIG. 8, a sequence flow diagram 800 of facilitating generation of a trained dataset based on the pre-recorded user voice input, the one or more voice features and the height data is shown in accordance with an example embodiment. At 802, the user 102 performs a setup of the wearable payment device 104. At 804, the wearable payment device 104 performs a pre-recording of a user voice input provided by the user 102. As explained earlier with reference to FIG. 4, the user voice input is used as an input for authentication of a payment transaction of a payment amount by the payment card.

[0097] At 806, the wearable payment device 104 learns one or more voice features of the user 102 from the pre-recorded user voice input, (*e.g.,* the pre-recorded user voice

input 704 of FIG. 7) to recognize the user voice input in different circumstances.

[0098] At 808, the wearable payment device 104 learns the height data of the wearable payment device 104 from ground level when attached on the user 102. For example, let height data, H = 150 cm, when the wearable payment device 104 is attached on ear of the user 102. At 810, the wearable payment device 104 sends the pre-recorded user voice input, the one or more voice features and the height data to the payment server 112.

[0099] At 812, the payment server 112 generates the trained dataset based on the pre-recorded user voice input, the one or more voice features and the height data. For example, the trained dataset may be generated in a format represented as ['pre-defined user voice input', 'voice', 'voice pitch', 'voice decibel', 'H']. It is noted that the format represented herein is used as an example for description purpose and the generation of the trained dataset may be represented in any other format, without limiting the scope of the present disclosure. In an example embodiment, the pre-defined user voice input may be annotated or labeled. The voice may be provided in a waveform audio (.wav) file, a MPEG-1 Audio Layer 3 (.mp3) file, or like.

[00100] In an illustrative example scenario, the trained dataset is represented as ['PROCEED', 'voice1.wav', '1', '1', '150'], ['PROCEED', voice1.wav', '0', '1', '150'], ['PROCEED', 'voice2.wav', '0', '0', '150'], ['PROCEED', 'voice3.wav' '1', '0', '150'], or the like. Here, the pre-recorded user voice input is annotated as 'PROCEED'. The voice of the user 102 for 'PROCEED' varies as 'voice1', 'voice2' and 'voice3'. The voice is stored in .wav file, such as 'voice1.wav', 'voice2.wav' and 'voice3.wav'. The voice pitch with value '1' indicates high voice pitch and '0' indicates low voice pitch. Likewise, the voice decibel with value '1' indicates high intensity and '0' indicates low intensity.

[00101] Further, the payment server 112 updates the trained dataset upon successful completion of a payment transaction. In an example embodiment, the trained dataset may be updated by providing additional datapoint or a score to the trained dataset. The trained dataset is updated so as to provide an improved voice-based payment transaction.

[00102] FIG. 9 illustrates a flow diagram 900 depicting a method for providing a hands-free cardless payment transaction, in accordance with another example embodiment

of the present disclosure. The method depicted in the flow diagram 900 may be executed by a wearable payment device, for example, the wearable payment device 104. Operations of the flow diagram 900, and combinations of operation in the flow diagram 900, may be implemented by, for example, hardware, firmware, a processor, circuitry and/or a different device associated with the execution of software that includes one or more computer program instructions. The method 900 starts at operation 902.

[00103] At operation 902, the method 900 includes establishing, by a processor of a wearable payment device of a user, a wireless connection via a short-range communication channel between the wearable payment device and a merchant terminal. The wearable payment device includes information corresponding to a payment card of the user. In an example embodiment, the wearable payment device searches whether the merchant terminal is within a pre-defined proximity range (refer FIG. 3). The wearable payment device receives a request from the merchant terminal to confirm an identification key identified by the merchant terminal. The wearable payment device determines a match between the identified identification key and an identification key associated with the wearable payment device. The wearable payment device sends a confirmation to the merchant terminal based on the determination. After the confirmation, activation of the wireless connection is indicated to the user based on at least emitting an LED playing a pre-recorded audio in the wearable payment device for a pre-defined time period (refer FIG. 4). Further, the wearable payment device transmits a connection signal to the merchant terminal for the pre-defined time period. This enables the merchant terminal to determine an intent of the user for the payment transaction.

[00104] At operation 904, the method 900 includes upon successful establishment of the wireless connection, transmitting, by the processor, the information corresponding to the payment card from the wearable payment device to the merchant terminal via a magnetic secure transmission. The transmitted information enables the merchant terminal to display details of the payment card thereon. In an example embodiment, the wearable payment device receives a voice-based approval command from the user to transmit the information of the payment card (refer FIG. 4). The voice-based approval command enables the wearable payment device to trigger a magnetic secure transmission module for the transmission.

[00105] At 906, the method 900 includes receiving, by the processor, a user voice

input from the user in the wearable payment device. The user voice input is an input for authentication of a payment transaction of a payment amount by the payment card (refer FIG. 5). In an example embodiment, the user voice input is pre-recorded during a setup of the wearable payment device by the user (refer FIG. 7). Further, during the setup, the wearable payment device learns one or more voice features of the user from the pre-recorded user voice input to recognize the user voice input in different circumstances. The one or more voice features includes at least a voice of the user, a voice pitch of the user and a voice decibel of the user. The wearable payment device also learns height data of the wearable payment device from ground level when attached on the user. The pre-recorded user voice input, the one or more voice features and the height data are sent to the payment server for authenticating the payment transaction. Further, the wearable payment device facilitates generation of a trained dataset based on the pre-recorded user voice input, the one or more voice features and the height data (refer FIG. 8). The trained dataset is updated by the payment server upon successful completion of the payment transaction.

[00106] At 908, the method 900 includes transmitting, by the processor, the user voice input to the merchant terminal via the wireless connection for authenticating the payment transaction. The wearable payment device also accesses an auxiliary authentication data provided by one or more sensors of the wearable payment device. The auxiliary authentication data includes a combination of at least a latitudinal data corresponding to a current location of the user and a longitudinal data corresponding to the current location of the user. The auxiliary authentication data is transmitted to the merchant terminal via the wireless connection (refer FIG. 6). Thus, the payment transaction is authenticated using the user voice input and the auxiliary authentication data. In an example embodiment, the authentication includes determining a match between the user voice input and the pre-recorded user voice input. The determination includes determining a voice of the user voice input and a voice of the pre-recorded user voice input, determining a match between a pitch of the user voice input and a pitch of the pre-recorded user voice input and determining a match between a decibel of the user voice input and a decibel of the pre-recorded user voice input. Further, the auxiliary authentication data is verified based on a location data corresponding to a location of a merchant. The location data includes at least a combination of a latitudinal data corresponding to the location of the merchant and a longitudinal data corresponding to the location of the merchant.

[00107] The sequence of operations of the method 900 need not be necessarily executed in the same order as they are presented. Further, one or more operations may be grouped together and performed in form of a single step, or one operation may have several sub-steps that may be performed in parallel or in sequential manner.

[00108] FIG. 10 illustrates a flow diagram depicting a method 1000 for providing a hands-free cardless payment transaction, in accordance with another example embodiment of the present disclosure. The method depicted in the flow diagram 1000 may be executed by a merchant terminal, for example, the merchant terminal 108. Operations of the flow diagram 1000, and combinations of operation in the flow diagram 1000, may be implemented by, for example, hardware, firmware, a processor, circuitry and/or a different device associated with the execution of software that includes one or more computer program instructions. The method 1000 starts at operation 1002.

[00109] At operation 1002, the method 1000 includes establishing, by a processing module of a merchant terminal, a wireless connection via a short-range communication channel between the merchant terminal and a wearable payment device of a user. The wearable payment device includes information corresponding to a payment card of the user.

[00110] At operation 1004, the method 1000 includes upon successful establishment of the wireless connection, receiving, by the processing module, the information corresponding to the payment card transmitted from the wearable payment device via a magnetic secure transmission. The transmitted information of the payment card is displayed thereon. In an example embodiment, the merchant terminal identifies an identification key corresponding to the wearable payment device searching for the merchant terminal within a pre-defined proximity range of the wearable payment device. The merchant terminal sends a request to the wearable payment device to confirm the identified identification key. The merchant terminal receives a confirmation for the identified identification key provided by the wearable payment device. After receiving the confirmation, the merchant terminal receives a connection signal transmitted from the wearable payment device for a pre-defined time period. The merchant terminal determines an intent of the user for the payment transaction based on the connection signal transmission.

[00111] At operation 1006, the method 1000 includes receiving, by the processing

module, a user voice input and an auxiliary authentication data of the user provided by the wearable payment device via the wireless connection for authentication of a payment transaction of a payment amount by the payment card. The auxiliary authentication data includes a combination of at least a combination of at least a latitudinal data corresponding to a current location of the user and a longitudinal data corresponding to the current location of the user.

[00112] At operation 1008, the method 1000 includes sending, by the processing module, a payment transaction request to a payment server via an acquirer server, the payment transaction request includes the information corresponding to the payment card, the payment amount, the user voice input and the auxiliary authentication data. In an example embodiment, the merchant terminal accesses a location data provided by one or more sensors of the merchant terminal for verifying the auxiliary authentication data (refer FIG. 6). The location data includes a combination of at least a latitudinal data corresponding to a current location of the merchant terminal and a longitudinal data corresponding to the current location of the merchant terminal. The merchant terminal sends the location data to the payment server via the acquirer server.

[00113] FIG. 11 is a simplified block diagram of the wearable payment device 1100 for providing a hands-free cardless payment transaction, in accordance with an embodiment of the present disclosure. The wearable payment device 1100 is an example of the wearable payment device 104 of FIG. 1. The wearable payment device 1100 includes at least one processor 1102 configured to execute executable instructions for providing various features of the present disclosure. The executing instructions are stored in a memory 1104. The memory 1104 includes an electromagnetic chip module 1108. The electromagnetic chip module 1108 is configured to store information corresponding to a payment card of a user. In an example embodiment, the electromagnetic chip module 1108 is configured to store the information corresponding to the payment card as magnetic stripe data. The information of the payment card includes at least one of a cardholder name, a cardholder address, an account number, an issuer bank name and any other information related to the payment card of the user. The wearable payment device 1100 further includes a communication interface 1106, an Input/Output module 1110, a sensor module 1112, a learning module 1114 and a speech recognition module 1116 that are operatively coupled with the processor 1102. The

components of the wearable payment device 1100 provided herein may not be exhaustive and that the wearable payment device 1100 may include more or fewer components than that of depicted in FIG. 11. Further, two or more components may be embodied in one single component, and/or one component may be configured using multiple sub-components to achieve the desired functionalities. Some components of the wearable payment device 1100 may be configured using hardware elements, software elements, firmware elements and/or a combination thereof.

[00114] The processor 1102 is operatively coupled to the communication interface 1106 such that wearable payment device 1100 is capable of communicating with a payment server, such as the payment server 112 or communicates with any entity within the network 116. The communication interface 1106 includes a short-range communication module 1118 and a magnetic secure transmission (MST) module 1120. In an embodiment, the short-range communication module 1118 is configured to establish a wireless connection via a short-range communication channel between the wearable payment device 1100 and the merchant terminal 1200. Some of the non-limiting examples of the short-range communication channel include, but not limited to, Bluetooth channel, Zigbee communication channel, Infrared channel, Near-Field Communication (NFC) channel, or the like. The communication interface 1106 is configured to receive a request from the merchant terminal 108 to confirm an identification key identified by the merchant terminal 108. The communication interface 1106 is further configured to send a confirmation to the merchant terminal 108 based on determining a match between the identified identification key and an identification key associated with the wearable payment device 1100. The match between the identified identification and the identification key is determined by the processor 1102. The communication may be achieved through API calls, without loss of generality.

[00115] The processor 1102 is further configured to execute the instructions to cause the wearable payment device 1100 to transmit the information corresponding to the payment card to the merchant terminal 108 via a magnetic secure transmission upon successful establishment of the wireless connection, to receive a user voice input from the user in the wearable payment device for authentication of a payment transaction of a payment amount by the payment card and to transmit the user voice input to the merchant terminal 108 via the wireless connection for authenticating the payment transaction.

[00116] In an embodiment, the Input/Output module 1110 (hereinafter referred to as an 'I/O module 1110') include mechanisms configured to receive inputs from and provide outputs to the user. The I/O module 1110 is configured to indicate activation of the wireless connection by at least emitting an LED and playing a pre-recorded audio for a pre-defined time period. In an example embodiment, the I/O module 1110 includes an LED module 1122 and an audio transceiver module 1124. The LED module 1122 is configured to emit the LED, such as green light, red light, or the like. The audio transceiver module 1124 is configured to play the pre-recorded audio, such as a beep tone, an audio logo, or the like. After the activation of the wireless connection is indicated, the short-range communication module 1118 transmits a connection signal to the merchant terminal 108 for the pre-defined time period.

[00117] The audio transceiver module 1124 is configured to receive a voice-based activation command and a voice-based approval command provided by the user. In an example embodiment, the audio transceiver module 1124 includes a microphone to receive the voice-based activation command and the voice-based approval command. The voice-based activation command and the voice-based approval command are recognized by the speech recognition module 1116. In an example embodiment, the speech recognition module 1116 includes a built-in speech recognition function. The built-in speech recognition function recognizes the voice-based activation command to switch on the wearable payment device 1100. The built-in speech recognition function also recognizes the voice-based approval command to trigger the MST module 1120. The MST module 1120 is configured to transmit the information corresponding to the payment card (*i.e.,* in the electromagnetic chip module 1108) to the merchant terminal via a magnetic secure transmission. The audio transceiver module 1124 is further configured to receive a user voice input of the user as an input for authentication of a payment transaction of a payment amount by the payment card. The user voice input is transmitted to the merchant terminal via the wireless connection by the short-range communication module 1118.

[00118] The sensor module 1112 is configured to provide an auxiliary authentication data for authenticating the payment transaction. The sensor module 1112 includes one or more sensors that provide a combination of at least a latitudinal data corresponding to a current location of the user and a longitudinal data corresponding to the current location of

the user. The one or more sensors include accelerometers, Global Positioning System (GPS), or the like. The auxiliary authentication data is transmitted to the merchant terminal 108 by the short-range communication module 1118.

[00119] In an example embodiment, the processor 1102 is also configured to perform a pre-recording of the user voice input. The pre-recording is performed during a setup of the wearable payment device 1100 by the user. The pre-recorded user voice input is received by the audio transceiver module 1124. The pre-recorded user voice input is stored in the learning module 1114. The learning module 1114 is configured to learn one or more voice features of the user from the pre-recorded user voice input to recognize the user voice input in different circumstances. The learning module 1114 is also configured to learn a height data of the wearable payment device 1100 for verifying the user. The height data is provided by the sensor module 1112. The sensor module 1112 is configured to provide the height data of the wearable payment device 1100 measured from ground level when attached on the user. Further, the pre-recorded user voice input, the one or more voice features and the height data are provided to the payment server 112 by the communication interface 1106.

[00120] Moreover, the various components of the wearable payment device 1100, such as the processor 1102, the memory 1104, the communication interface 1106, the input/output module 1110, the sensor module 1112, the learning module 1114 and the speech recognition module 1116 may be configured to communicate with each other via or through a centralized circuitry (not shown). The centralized circuit system may be various devices configured to, among other things, provide or enable communication between the components (1104 - 1116) of the wearable payment device 1100. In certain embodiments, the centralized circuit system may be a central printed circuit board (PCB) such as a motherboard, a main board, a system board, or a logic board. The centralized circuit system may also, or alternatively, include other printed circuit assemblies (PCAs) or communication channel media. In some embodiments, the centralized circuit system may include appropriate storage interfaces to facilitate communication among the components (1102 - 1118). Some examples of the storage interface may include, for example, an Advanced Technology Attachment (ATA) adapter, a Serial ATA (SATA) adapter, a Small Computer System Interface (SCSI) adapter, a RAID controller, a SAN adapter, a network adapter, and/or any component providing the wearable payment device 1100 with access to the data stored in a

memory (not shown in FIG. 11).

[00121] FIG. 12 is a simplified block diagram of a merchant terminal 1200 for providing the hands-free cardless payment transaction, in accordance with an example embodiment of the present disclosure. The merchant terminal 1200 is an example of the merchant terminal 108 of FIG. 1. The components of the merchant terminal 1200 provided herein may not be exhaustive and that the merchant terminal 1200 may include more or fewer components than that of depicted in FIG. 12. Further, two or more components may be embodied in one single component, and/or one component may be configured using multiple sub-components to achieve the desired functionalities. Some components of the merchant terminal 1200 may be configured using hardware elements, software elements, firmware elements and/or a combination thereof.

[00122] The merchant terminal includes a processing module 1202 and a memory 1204 storing executable instructions. The processing module 1202 is operatively coupled to a communication interface 1206 such that the merchant terminal 1200 is capable of communicating with the wearable payment device, such as the wearable payment device 1100 of FIG. 11 using a wireless connection via short-range communication channel. In an embodiment, the communication interface 1206 includes a short-range communication module 1210 and a magnetic card reader module 1212. The short-range communication module 1210 is configured to establish the wireless connection via the short-range communication channel with the wearable electronic device 1100. Examples of the short-range communication channel include, but not limited to, Bluetooth channel, Zigbee communication channel, Infrared channel, Near-Field Communication (NFC) channel, or the like. The magnetic card reader module 1212 is configured to read the information corresponding to the payment card transmitted via the magnetic secure transmission.

[00123] The processing module 1202 is configured to execute the instructions and cause the merchant terminal 1200 to receive information corresponding to the payment card transmitted from the wearable payment device 1100 via a magnetic secure transmission, receive a user voice input and an auxiliary authentication data of the user provided by the wearable payment device 1100 for authentication of a payment transaction of a payment amount by the payment card and send a payment transaction request (including the payment amount, the user voice input and the auxiliary authentication data) to a payment server (*e.g.,*

the payment server 112) via an acquirer server (*e.g.,* the acquirer server 114). In an example embodiment, the processing module 1202 is configured to identify an identification key corresponding to the wearable payment device 1100 searching for the merchant terminal 1200 within a pre-defined proximity range of the wearable payment device 1100.

[00124] The communication interface 1206 is also configured to send a request to the wearable payment device 1100 to confirm an identified identification key and receive a confirmation for the identified identification key provided by the wearable payment device 1100. Further, the communication interface 1206 is also configured to communicate with acquirer server 114, the payment server 112 or communicates with any entity within the network 116. The communication is achieved through API calls, without loss of generality. After receiving the confirmation, the communication interface 1206 receives a connection signal transmitted from the wearable payment device 1100 for a pre-defined time period. This enables the processing module 1202 to determine an intent of the user for the payment transaction.

[00125] The processing module 1202 is further configured to access a location data provided by one or more sensors. The one or more sensors, such as GPS sensor and/or the like are embodied in the sensor module 1214. The location data includes a combination of at least a latitudinal data corresponding to a current location of the merchant terminal 1200 and a longitudinal data corresponding to the current location of the merchant terminal 1200. The location data is provided to the payment server 112 via the acquirer server 114 by the communication interface 1206.

[00126] The merchant terminal 1200 further includes an input/output module 1208. The Input/Output module 1208 (hereinafter referred to as an 'I/O module 1208') is configured to display the identified identification key, the payment amount, the information corresponding to the payment card, notification on transaction status or the like to the merchant. The I/O module 1208 includes mechanisms configured to receive inputs from and provide outputs to the merchant. To that effect, the I/O module 1208 may include at least one input interface and/or at least one output interface. Examples of the input interface may include, but are not limited to, a keypad, a touch screen, soft keys, a microphone, and the like. Examples of the output interface may include, but are not limited to, a display such as a light emitting diode display, a thin-film transistor (TFT) display, a liquid crystal display,

an active-matrix organic light-emitting diode (AMOLED) display, a microphone, a speaker, a ringer, a vibrator, and the like.

[00127] FIG. 13 is a simplified block diagram of an acquirer server 1300, in accordance with an example embodiment of the present disclosure. The acquirer server 1300 is associated with an acquirer bank, which may be associated with the merchant (*e.g.,* the merchant 106). The merchant may have established an account to accept payment for purchase of items from users. The acquirer server 1300 is an example of the acquirer server 112 of FIG. 1 or may be embodied in the acquirer server 112. Further, the acquirer server 1300 is configured to facilitate payment with the payment server 1400 using a payment network, such as the network 116 of FIG. 1. The acquirer server 1300 includes a processing module 1302 communicably coupled to a database 1304 and a communication module 1306. The components of the acquirer server 1300 provided herein may not be exhaustive, and that the acquirer server 1300 may include more or fewer components than that of depicted in FIG. 11. Further, two or more components may be embodied in one single component, and/or one component may be configured using multiple sub-components to achieve the desired functionalities. Some components of the acquirer server 1300 may be configured using hardware elements, software elements, firmware elements and/or a combination thereof.

[00128] The database 1304 includes data of one or more merchant parameters, such as, but not limited to, a merchant primary account number (PAN), a merchant name, a merchant ID (MID), a merchant category code (MCC), a merchant city, a merchant postal code, a merchant brand name, etc., used for processing transactions. The processing module 1302 is configured to use the MID or any other merchant parameter such as the merchant PAN to identify the merchant during the normal processing of payment transactions, refunds, adjustments, chargebacks, end-of-month fees, loyalty programs associated with the merchant and so forth. The processing module 1302 may be configured to store and update the merchant parameters in the database 1304 for later retrieval. In an embodiment, the communication module 1306 is capable of facilitating operative communication with a remote device 1308, such as, the merchant terminal 108, a payment server, such as the payment server 112 or communicates with any entity within a network, such as the network 116.

[00129] The communication module 1306 is configured to receive the payment transaction request that includes information corresponding to a payment card, a payment amount, a user voice input and an auxiliary authentication data of a user from the merchant terminal 108. The communication module 1306 is further configured to send the payment transaction request (including the information corresponding to the payment card, the payment amount, the user voice input and the auxiliary data) to the payment server 112. The communication module 1306 is also configured to receive an authentication status of the payment transaction from the payment server 112 and forward the authentication status to the merchant terminal 1200.

[00130] FIG. 14 is a simplified block diagram of a payment server 1400, in accordance with an example embodiment of the present disclosure. The payment server 1400 is an example of the payment server 112 of FIG. 1 or may be embodied in the payment server 112. The payment server 1400 is configured to perform authentication of a payment transaction of a payment amount by a payment card of the user using a user voice input and an auxiliary authentication data. The payment server 1400 includes a processing module 1402 configured to extract programming instructions from a memory 1404. The processing module 1402 is configured to authenticate a payment transaction of a user using a user voice input and an auxiliary authentication data of the user provided by the merchant terminal 1200.

[00131] The processing module 1402 is configured to communicate with one or more remote devices, such as remote device 1412 using a communication interface 1406 over a network, such as the network 116 of FIG. 1. The examples of the remote device 1412 includes the wearable payment device 1100, the merchant terminal 1200, the acquirer server 1300, or any entity within the network 116. The communication is achieved through API calls, without loss of generality. The communication interface 1406 is capable of facilitating such operative communication with the remote devices and cloud servers using API (Application Program Interface) calls. The communication interface 1406 is configured to receive a payment transaction request provided by the merchant terminal 1200 via the acquirer server 1300 using the network 116. The payment transaction request includes information corresponding to a payment card, a payment amount, a user voice input and an auxiliary authentication data of a user. The communication interface 1406 is also configured

to receive a pre-recorded user voice input, one or more voice features and a height data of the user provided by the wearable payment device 1100 via the network 116. The one or more voice features include a voice of the user, a voice pitch of the user and a voice decibel of the user.

[00132] Further, the payment server 1400 includes an authentication module 1408. The authentication module 1408 is configured to determine a match between the user voice input and the pre-recorded user voice input. In an example embodiment, the payment server 1400 determines a match between a voice, a voice pitch and a voice decibel of the user voice input and a voice, a voice pitch and a voice decibel of the pre-recorded user voice input. Further, the authentication module 1408 is also configured to verify the auxiliary authentication data based on a location data of the merchant terminal.

[00133] In one embodiment, the processing module 1402 is configured to generate a trained dataset based on the pre-recorded user voice input, the one or more voice features and the height data. The processing module 1402 is also configured to update the trained dataset upon successful completion of the payment transaction. The trained dataset is stored in a database, such as database 1410. The processing module 1402 may also be operatively coupled to the database 1410. The database 1410 is any computer-operated hardware suitable for storing and/or retrieving data, such as, but not limited to, transaction data generated as part of sales activities conducted over the bankcard network including data relating to merchants, account holders or customers, and purchases. The database 1410 may also store information related to a plurality of users' payment cards. Each user payment card data includes at least one of a user name, a user address, an account number, and/or the like. The database 1410 may also store a location data of a merchant provided by the merchant terminal 1200.

[00134] The components of the payment server 1400 provided herein may not be exhaustive, and that the payment server 1400 may include more or fewer components than that of depicted in FIG. 14. Further, two or more components may be embodied in one single component, and/or one component may be configured using multiple sub-components to achieve the desired functionalities. Some components of the payment server 1400 may be configured using hardware elements, software elements, firmware elements and/or a combination thereof.

[00135] Without limiting the scope of the present disclosure, the one or more example embodiments disclosed herein is to provide methods and systems for providing hands-free payment transactions. More specifically, the payment transactions are performed by using a wearable payment device that stores information corresponding to a payment card of a user. Thus, the user can make a payment transaction, without having the need to carry a payment card. The wearable payment device identifies the user based on a height data that is specific to the user, which provides an enhanced security. Further, the payment card information is provided to a merchant terminal via a magnetic secure transmission after a wireless connection is established between the wearable payment device and the merchant terminal. This mitigates manual operation for the payment transaction by the user. The payment transaction is authenticated using a user voice input and an auxiliary authentication data. Thus, the user is not required to remember a password, such as a PIN for the payment transaction as the user voice input is used as the password. The auxiliary authentication data provides a latitudinal data and a longitudinal data corresponding to a current location of the user that are verified based on location data of the merchant.

[00136] The disclosed methods with reference to FIGS. 1 to 14, or one or more operations of the flow diagram 900 and the flow diagram 1000 may be implemented using software including computer-executable instructions stored on one or more computer-readable media (*e.g.,* non-transitory computer-readable media, such as one or more optical media discs, volatile memory components (*e.g.,* DRAM or SRAM), or nonvolatile memory or storage components (*e.g.,* hard drives or solid-state nonvolatile memory components, such as Flash memory components) and executed on a computer (*e.g.,* any suitable computer, such as a laptop computer, net book, Web book, tablet computing device, smart phone, or other mobile computing device). Such software may be executed, for example, on a single local computer or in a network environment (*e.g.,* via the Internet, a wide-area network, a local-area network, a remote web-based server, a client-server network (such as a cloud computing network), or other such network) using one or more network computers. Additionally, any of the intermediate or final data created and used during implementation of the disclosed methods or systems may also be stored on one or more computer-readable media (*e.g.,* non-transitory computer-readable media) and are considered to be within the scope of the disclosed technology. Furthermore, any of the software-based embodiments may be uploaded, downloaded, or remotely accessed through a suitable communication

means. Such suitable communication means include, for example, the Internet, the World Wide Web, an intranet, software applications, cable (including fiber optic cable), magnetic communications, electromagnetic communications (including RF, microwave, and infrared communications), electronic communications, or other such communication means.

[00137] Although the disclosure has been described with reference to specific exemplary embodiments, it is noted that various modifications and changes may be made to these embodiments without departing from the broad spirit and scope of the disclosure. For example, the various operations, blocks, etc., described herein may be enabled and operated using hardware circuitry (for example, complementary metal oxide semiconductor (CMOS) based logic circuitry), firmware, software and/or any combination of hardware, firmware, and/or software (for example, embodied in a machine-readable medium). For example, the apparatuses and methods may be embodied using transistors, logic gates, and electrical circuits (for example, application specific integrated circuit (ASIC) circuitry and/or in Digital Signal Processor (DSP) circuitry).

[00138] Particularly, the wearable payment device 1100 (*e.g.* the wearable payment device 104) and its various components such as the processor 1102 and the memory 1104 may be enabled using software and/or using transistors, logic gates, and electrical circuits (for example, integrated circuit circuitry such as ASIC circuitry). Various embodiments of the disclosure may include one or more computer programs stored or otherwise embodied on a computer-readable medium, wherein the computer programs are configured to cause a processor or computer to perform one or more operations. A computer-readable medium storing, embodying, or encoded with a computer program, or similar language, may be embodied as a tangible data storage device storing one or more software programs that are configured to cause a processor or computer to perform one or more operations. Such operations may be, for example, any of the steps or operations described herein. In some embodiments, the computer programs may be stored and provided to a computer using any type of non-transitory computer readable media. Non-transitory computer readable media include any type of tangible storage media. Examples of non-transitory computer readable media include magnetic storage media (such as floppy disks, magnetic tapes, hard disk drives, etc.), optical magnetic storage media (e.g. magneto-optical disks), CD-ROM (compact disc read only memory), CD-R (compact disc recordable), CD-R/W (compact disc

rewritable), DVD (Digital Versatile Disc), BD (BLU-RAY® Disc), and semiconductor memories (such as mask ROM, PROM (programmable ROM), EPROM (erasable PROM), flash memory, RAM (random access memory), etc.). Additionally, a tangible data storage device may be embodied as one or more volatile memory devices, one or more non-volatile memory devices, and/or a combination of one or more volatile memory devices and non-volatile memory devices. In some embodiments, the computer programs may be provided to a computer using any type of transitory computer readable media. Examples of transitory computer readable media include electric signals, optical signals, and electromagnetic waves. Transitory computer readable media can provide the program to a computer via a wired communication line (e.g. electric wires, and optical fibers) or a wireless communication line.

[00139] Various embodiments of the disclosure, as discussed above, may be practiced with steps and/or operations in a different order, and/or with hardware elements in configurations, which are different than those which, are disclosed. Therefore, although the disclosure has been described based upon these exemplary embodiments, it is noted that certain modifications, variations, and alternative constructions may be apparent and well within the spirit and scope of the disclosure.

[00140] Although various exemplary embodiments of the disclosure are described herein in a language specific to structural features and/or methodological acts, the subject matter defined in the appended claims is not necessarily limited to the specific features or acts described above. Rather, the specific features and acts described above are disclosed as exemplary forms of implementing the claims.

CLAIMS

What is claimed is:

1. A computer-implemented method, comprising:

establishing, by a processor of a wearable payment device of a user, a wireless connection via a short-range communication channel between the wearable payment device and a merchant terminal, the wearable payment device comprising information corresponding to a payment card of the user;

upon successful establishment of the wireless connection, transmitting, by the processor, the information corresponding to the payment card from the wearable payment device to the merchant terminal via a magnetic secure transmission, wherein the transmitted information enables the merchant terminal to display details of the payment card thereon;

receiving, by the processor, a user voice input from the user in the wearable payment device, the user voice input being an input for authentication of a payment transaction of a payment amount by the payment card;

accessing, by the processor, a height of the wearable payment device from ground level; and

transmitting, by the processor, the user voice input and the height of the wearable payment device from ground level to the merchant terminal via the wireless connection for authenticating the payment transaction.

2. The method as claimed in claim 1, further comprising:

performing, by the processor, a pre-recording of the user voice input during a setup of the wearable payment device by the user;

learning, by the processor, one or more voice features of the user from a pre-recorded user voice input to recognize the user voice input in different circumstances, the one or more voice features comprising at least a voice of the user, a voice pitch of the user and a voice decibel of the user; and

learning, by the processor, a height data of the wearable payment device from ground level when attached on the user, the height data being used for verifying the user of

the wearable payment device.

3. The method as claimed in claim 2, further comprising:

sending, by the processor, the pre-recorded user voice input, the one or more voice features and the height data to a payment server for authenticating the payment transaction;

facilitating, by the processor, generation of a trained dataset by the payment server based on the pre-recorded user voice input, the one or more voice features and the height data.

4. The method as claimed in claim 3, wherein the trained dataset is updated by the payment server upon successful completion of the payment transaction.

5. The method as claimed in any of the claims 1 to 3, wherein establishing the wireless connection comprises:

searching, by the processor, whether the merchant terminal is within a pre-defined proximity range of the wearable payment device;

receiving, by the processor, a request from the merchant terminal to confirm an identification key identified by the merchant terminal;

determining, by the processor, a match between the identified identification key and an identification key associated with the wearable payment device; and

sending, by the processor, a confirmation to the merchant terminal based on the determination.

6. The method as claimed in claim 5, further comprising:

indicating, by the processor, activation of the wireless connection to the user by at least emitting an LED and playing a pre-recorded audio for a pre-defined time period;

transmitting, by the processor, a connection signal to the merchant terminal for the pre-defined time period; and

facilitating, by the processor, determination of an intent of the user for the payment transaction by the merchant terminal based on the connection signal transmission.

7. The method as claimed in any of the claims 1 to 5, wherein transmitting the information corresponding to the payment card comprises:

receiving, by the processor, a voice-based approval command from the user to transmit the information of the payment card, the voice-based approval command corresponding to the payment amount; and

triggering, by the processor, a magnetic secure transmission module for the transmission upon receipt of the voice-based approval command.

8. The method as claimed in any of the claims 1 to 5, wherein transmitting the user voice input comprises:

accessing, by the processor, an auxiliary authentication data provided by one or more sensors for authenticating the payment transaction, the auxiliary authentication data comprising a combination of at least a latitudinal data corresponding to a current location of the user and a longitudinal data corresponding to the current location of the user; and

transmitting, by the processor, the auxiliary authentication data to the merchant terminal via the wireless connection.

9. The method as claimed in any of the claims 1 to 5, wherein the authentication of the payment transaction comprises:

determining a match between the user voice input and a pre-recorded voice input by a payment server, wherein the determination comprises:

determining a match between a voice of the user voice input and a voice of the pre-recorded user voice input;

determining a match between a voice pitch of the user voice input and a voice pitch of the pre-recorded user voice input; and

determining a match between a voice decibel of the user voice input and a voice decibel of the pre-recorded user voice input; and

verifying the auxiliary authentication data based on location data corresponding to a location of the merchant terminal, the location data comprising at least a

combination of a latitudinal data corresponding to the location of the merchant and a longitudinal data corresponding to the location of the merchant.

10. A wearable payment device comprising:

a communication interface configured to establish a wireless connection via a short-range communication channel between the wearable payment device and a merchant terminal;

a memory storing executable instructions and configured to store information corresponding to a payment card of the user; and

a processor communicably coupled to the communication interface and configured to execute the instructions to cause the wearable payment device to perform at least in part to:

transmit the information corresponding to the payment card to the merchant terminal via a magnetic secure transmission upon successful establishment of the wireless connection, wherein the transmitted information enables the merchant terminal to display details of the payment card thereon;

receive a user voice input from the user in the wearable payment device, the user voice input being an input for authentication of a payment transaction of a payment amount by the payment card;

access a height of the wearable payment device from ground level; and

transmit the user voice input and the height of the wearable payment device from ground level to the merchant terminal via the wireless connection for authenticating the payment transaction.

11. The wearable payment device as claimed in claim 10, wherein the processor is further configured to cause the wearable payment device to:

perform a pre-recording of the user voice input during a setup of the wearable payment device by the user;

learn one or more voice features of the user from a pre-recorded user voice input to recognize the user voice input in different circumstances, the one or more voice features comprising at least a voice of the user, a voice pitch of the user and a voice

decibel of the user; and

learn a height data of the wearable payment device from ground level when attached on the user.

12. The wearable payment device as claimed in claim 11, wherein the processor is further configured to cause the wearable payment device to:

send the pre-recorded user voice input, the one or more voice features and the height data to a payment server for authenticating the payment transaction;

facilitate generation of a trained dataset of the pre-recorded user voice input by the payment server based on the one or more voice features.

13. The wearable payment device as claimed in claim 12, wherein the trained dataset is updated by the payment server upon successful completion of the payment transaction.

14. The wearable payment device as claimed in claim 10, wherein for establishing the wireless connection, the wearable payment device is further caused to:

search whether the merchant terminal is within a pre-defined proximity range of the wearable payment device;

receive a request from the merchant terminal to confirm an identification key identified by the merchant terminal;

determine a match between the identified identification key and an identification key associated with the wearable payment device; and

send a confirmation to the merchant terminal based on the determination.

15. The wearable payment device as claimed in claim 14, wherein the processor is further configured to cause the wearable payment device to:

indicate activation of the wireless connection to the user by at least emitting an LED and playing a pre-recorded audio for a pre-defined time period;

transmit a connection signal to the merchant terminal for the pre-defined time period; and

facilitate determination of an intent of the user for the payment transaction by the merchant terminal based on the connection signal transmission.

16. The wearable payment device as claimed in claim 10, wherein for transmitting the information corresponding to the payment card, the wearable payment device is further caused to:

receive a voice-based approval command from the user to transmit the information of the payment card, the voice-based approval command corresponding to the payment amount; and

trigger a magnetic secure transmission module for the transmission upon receipt of the voice-based approval command.

17. The wearable payment device as claimed in claim 10, wherein for transmitting the user voice input, the wearable payment device is further caused to:

access an auxiliary authentication data provided by one or more sensors for authenticating the payment transaction, the auxiliary authentication data comprising: a combination of at least a latitudinal data of the user corresponding to a current location of the user and a longitudinal data corresponding to the current location of the user; and

transmit the auxiliary authentication data to the merchant terminal via the wireless connection.

18. A computer-implemented method comprising:

establishing, by a processing module of a merchant terminal, a wireless connection via a short-range communication channel between the merchant terminal and a wearable payment device of a user, the wearable payment device comprising information corresponding to a payment card of the user;

upon successful establishment of the wireless connection, receiving, by the processing module, the information corresponding to the payment card transmitted from the wearable payment device via a magnetic secure transmission, wherein the transmitted information of the payment card is displayed thereon;

receiving, by the processing module, a user voice input and an auxiliary authentication data of the user provided by the wearable payment device via the wireless connection for authentication of a payment transaction of a payment amount by the payment card, the auxiliary authentication data comprising a height of the wearable device from ground level and a combination of at least a combination of at least a latitudinal data corresponding to a current location of the user and a longitudinal data corresponding to the current location of the user; and

sending, by the processing module, a payment transaction request to a payment server via an acquirer server, the payment transaction request comprising the information corresponding to the payment card, the payment amount, the user voice input and the auxiliary authentication data.

19. The method as claimed in claim 18, further comprising:

accessing, by the processing module, a location data provided by one or more sensors of the merchant terminal for verifying the auxiliary authentication data, the location data comprising a combination of at least a latitudinal data corresponding to a current location of the merchant terminal and a longitudinal data corresponding to the current location of the merchant terminal; and

sending, by the processing module, the location data to the payment server via the acquirer server.

20. The method as claimed in claim 18, wherein the establishing of the wireless connection comprises:

identifying, by the processing module, an identification key corresponding to the wearable payment device searching for the merchant terminal within a pre-defined proximity range of the wearable payment device;

sending, by the processing module, a request to the wearable payment device to confirm the identified identification key;

receiving, by the processing module, a confirmation for the identified identification key based on determining whether the identified identification matches with an identification key associated with the wearable payment device;

receiving, by the processing module, a connection signal transmitted from the wearable payment device for a pre-defined time period; and

determining, by the processing module, an intent of the user for the payment transaction based on the connection signal transmission.