

NFC ENHANCED AUGMENTED REALITY INFORMATION OVERLAYS

BACKGROUND

[0001] For customers, shopping online may offer certain advantages over shopping in a store. For example, online customers may be able to read various product reviews, read numerous user comments, view specification sheets, view images or videos of products outside of their packaging, etc. prior to purchasing a product. For in-store customers, however, product-related information, such as reviews, comments, or the like may not be readily available unless the customers perform online searches of every product they wish to purchase, which may be a tedious and time-consuming task.

RELATED APPLICATIONS

[0002] This application claims priority to U.S. Patent Application Serial No. 16/423,482, titled “NFC ENHANCED AUGMENTED REALITY INFORMATION OVERLAYS” filed on May 28, 2019. The contents of the aforementioned application are incorporated herein by reference in their entirety.

SUMMARY

[0002a] According to a first aspect of the present disclosure, there is provided a method comprising:

receiving, by a computing device, encrypted authentication data from a contactless card of a user;

transmitting, by the device to an authentication server, a one-tap authentication request comprising the encrypted authentication data to authenticate the user based on the encrypted authentication data;

receiving, by the device, a one-tap authentication confirmation specifying the authentication server decrypted the encrypted authentication data to authenticate the user;

accessing, by the device, a personal profile associated with the user based at least in part on the one-tap authentication confirmation, wherein the personal profile is associated with the contactless card;

receiving, by the device, one or more product identification numbers from one or more tags in a store;

receiving, by the device from the one or more tags, product information associated with a plurality of products based on the received product identification numbers, wherein the product information comprises in-store customer comments and/or reviews corresponding to the plurality of products;

determining, by the device, product information corresponding to the product identification numbers that is relevant to the user to generate relevant product information;

generating, by the device, a filtered plurality of products by filtering a first product of the plurality of products based on a determination that the first product is not relevant to the user;

launching, by the device based on the one-tap authentication confirmation, an application including an augmented reality (AR) graphical user interface (GUI); and

overlaying, by the application, the relevant product information of the filtered plurality of products in the AR GUI proximate to the filtered plurality of products.

[0002b] According to a second aspect of the present disclosure, there is provided a non-transitory computer-readable storage medium, the computer-readable storage medium including instructions that when executed by a processor, cause the processor to:

receive encrypted authentication data from a contactless card of a user;

transmit, to an authentication server, a one-tap authentication request comprising the encrypted authentication data to authenticate the user based on the encrypted authentication data;

receive, from the authentication server, a one-tap authentication confirmation specifying the authentication server decrypted the encrypted authentication data to authenticate the user;

access a personal profile associated with the user based at least in part on the one-tap authentication confirmation, wherein the personal profile is associated with the contactless card;

receive one or more product identification numbers from one or more tags in a store;

receive, from the one or more tags, product information associated with a plurality of products based on the received product identification numbers, wherein the product information comprises in-store customer comments and/or reviews corresponding to the plurality of products;

determine product information corresponding to the product identification numbers that is relevant to the user to generate relevant product information;

generate a filtered plurality of products by filtering a first product of the plurality of products based on a determination that the first product is not relevant to the user;

launch, based on the one-tap authentication confirmation, an application including an augmented reality (AR) graphical user interface (GUI); and

overlay, by the application, the relevant product information of the filtered plurality of products in the AR GUI proximate to the filtered plurality of products.

[0002c] According to a third aspect of the present disclosure, there is provided a computing apparatus comprising:

a processor; and

a memory storing instructions that, when executed by the processor, cause the processor to:

receive encrypted authentication data from a contactless card of a user;

transmit, to an authentication server, a one-tap authentication request comprising the encrypted authentication data to authenticate the user based on the encrypted authentication data;

receive, from the authentication server, a one-tap authentication confirmation specifying the authentication server decrypted the encrypted authentication data to authenticate the user;

access a personal profile associated with the user based at least in part on the one-tap authentication confirmation, wherein the personal profile is associated with the contactless card;

receive one or more product identification numbers from one or more tags in a store;

receive, from the one or more tags, product information associated with a plurality of products based on the received product identification numbers, wherein the product information comprises in-store customer comments and/or reviews corresponding to the plurality of products;

determine product information corresponding to the product identification numbers that is relevant to the user to generate relevant product information;

generate a filtered plurality of products by filtering a first product of the plurality of products based on a determination that the first product is not relevant to the user;

launch, based on the one-tap authentication confirmation, an application including an augmented reality (AR) graphical user interface (GUI); and

overlay, by the application, the relevant product information of the filtered plurality of products in the AR GUI proximate to the filtered plurality of products.

[0003] Various embodiments are directed to overlaying relevant product information in augmented reality via the use of near-field communication (NFC) and a product selection system. A user may authenticate into an application or user profile. Information about the user in the user profile may be used to determine which products are relevant to the user. Information related to the relevant products may then be displayed to the user in augmented reality, which improves at least the overall shopping and in-store experience.

BRIEF DESCRIPTION OF THE DRAWINGS

[0004] **FIG. 1A** illustrates an example data transmission system in accordance with one or more embodiments.

CLAIMS

What is claimed is:

1. A method comprising:

receiving, by a computing device, encrypted authentication data from a contactless card of a user;

transmitting, by the device to an authentication server, a one-tap authentication request comprising the encrypted authentication data to authenticate the user based on the encrypted authentication data;

receiving, by the device, a one-tap authentication confirmation specifying the authentication server decrypted the encrypted authentication data to authenticate the user;

accessing, by the device, a personal profile associated with the user based at least in part on the one-tap authentication confirmation, wherein the personal profile is associated with the contactless card;

receiving, by the device, one or more product identification numbers from one or more tags in a store;

receiving, by the device from the one or more tags, product information associated with a plurality of products based on the received product identification numbers, wherein the product information comprises in-store customer comments and/or reviews corresponding to the plurality of products;

determining, by the device, product information corresponding to the product identification numbers that is relevant to the user to generate relevant product information;

generating, by the device, a filtered plurality of products by filtering a first product of the plurality of products based on a determination that the first product is not relevant to the user;

launching, by the device based on the one-tap authentication confirmation, an application including an augmented reality (AR) graphical user interface (GUI); and

overlaying, by the application, the relevant product information of the filtered plurality of products in the AR GUI proximate to the filtered plurality of products.

2. The method of claim 1, further comprising:

detecting, by the device, one or more signals from the one or more tags in the store, wherein the tags include radio frequency identification (RFID) tags or near-field communication (NFC) tags, wherein the signals are detected by RFID readers or NFC readers.

3. The method of claim 1, further comprising:

receiving, by the device, web-based information corresponding to the plurality of products based at least in part on the product information, wherein the web-based information comprises: (i) images of items in each of the plurality of products such that the items are viewable outside a packaging of each product, (ii) web reviews, (iii) specification sheets, and (iv) web ratings; and

displaying, by the application in the AR GUI, the web-based information proximate to the respective filtered plurality of products.

4. The method of claim 1, wherein the one or more relevant in-store customer comments and/or reviews are in-store customer comments and/or reviews corresponding to the plurality of products meeting the following criteria: (i) previously purchased products, (ii) products related to a meal plan set by the user, (iii) products comporting with a dietary restriction of the user, (iv) product allowed under a diet the user is on, (v) products related to a favorite snack of the user, (vi) product related to a favorite seasonal fruit of the user, (vii) products related to a favorite protein of the user, (viii) discounted products or specials on products specified by the user, (ix) products related to frequently purchased products by the user, (x) products recommended by a personal shopper system associated with the user, and (xi) products meeting a threshold product rating set by the user.

5. The method of claim 1, wherein determining the relevant product information comprises: (i) analyzing past financial transactions made by the user via the contactless card at the store, (ii) determining one or more shopping patterns and one or more

budget-related preferences in the analyzed financial transactions and whether the one or more shopping patterns and the one or more budget-related preferences relate to any of the plurality of products with the product information, and (iii) determining whether there is a predetermined price not to be exceeded for a specific item and determining, for each of the plurality of products, whether the product relates to the specific item and whether the product exceeds the predetermined price.

6. The method of claim 1, wherein the encrypted authentication data is generated by the contactless card based at least in part on a private key and a counter value for the contactless card stored in a memory of the contactless card, the method further comprising:

transmitting (i) a merchant identifier of a merchant, (ii) a transaction identifier, and (iii) the encrypted authentication data to the authentication server, the authentication server to verify the encrypted authentication data by decrypting the encrypted authentication data based at least in part on the private key and the counter value for the contactless card stored in a memory of the authentication server;

generating, by a virtual account number server based on the verification of the encrypted authentication data, a virtual account number;

transmitting, by the virtual account number server, the merchant identifier, the transaction identifier, the virtual account number, an expiration date associated with the virtual account number, and a card verification value (CVV) associated with the virtual account number to a merchant server associated with the merchant; and

processing, by the merchant server, the transaction using the transaction identifier, the virtual account number, the expiration date, and the CVV.

7. The method of claim 1, wherein the overlaid product information are color coded in a first color to indicate a first type of information and in a second color different from the first color to indicate a second type of information different from the first type of information, wherein the first type of information indicates that the one or more relevant in-store customer comments and/or reviews are positive and the second type of information indicates that the one or more relevant in-store customer comments and/or reviews are negative, wherein the authentication of the user via the contactless

card automatically logs the user into the application and allows the user to enter a review of the plurality of products via the application.

8. The method of claim 1, wherein the product information further comprises: (i) external reviews or comments related to the plurality of products, (ii) customer ratings of the plurality of products, (iii) safety-related information related to the plurality of products, and (iv) images of content contained inside packaging of the plurality of products.

9. The method of claim 1, wherein the personal profile comprises: (i) a dietary restriction of the user, (ii) a meal plan set by the user, (iii) a diet that the user is on, (iv) a favorite snack, (v) a favorite seasonal fruit, (vii) a budget plan, (viii) a list of products purchased during a predefined time period, (ix) a favorite protein, (x) a preference for a specific discounted product, (xi) a list of frequently purchased products, (xii) a personal shopper system linked by the user, and (xiii) a product rating preference set by the user.

10. A non-transitory computer-readable storage medium, the computer-readable storage medium including instructions that when executed by a processor, cause the processor to:

- receive encrypted authentication data from a contactless card of a user;
- transmit, to an authentication server, a one-tap authentication request comprising the encrypted authentication data to authenticate the user based on the encrypted authentication data;
- receive, from the authentication server, a one-tap authentication confirmation specifying the authentication server decrypted the encrypted authentication data to authenticate the user;
- access a personal profile associated with the user based at least in part on the one-tap authentication confirmation, wherein the personal profile is associated with the contactless card;
- receive one or more product identification numbers from one or more tags in a store;

receive, from the one or more tags, product information associated with a plurality of products based on the received product identification numbers, wherein the product information comprises in-store customer comments and/or reviews corresponding to the plurality of products;

determine product information corresponding to the product identification numbers that is relevant to the user to generate relevant product information;

generate a filtered plurality of products by filtering a first product of the plurality of products based on a determination that the first product is not relevant to the user;

launch, based on the one-tap authentication confirmation, an application including an augmented reality (AR) graphical user interface (GUI); and

overlay, by the application, the relevant product information of the filtered plurality of products in the AR GUI proximate to the filtered plurality of products.

11. The computer-readable storage medium of claim 10, wherein the instructions further cause the processor to:

detect one or more signals from the one or more tags in the store, wherein the tags include radio frequency identification (RFID) tags or near-field communication (NFC) tags, wherein the signals are detected by RFID readers or NFC readers.

12. The computer-readable storage medium of claim 10, wherein the instructions further cause the processor to:

receive web-based information corresponding to the plurality of products based at least in part on the product information, wherein the web-based information comprises: (i) images of items in each of the plurality of products such that the items are viewable outside a packaging of each product, (ii) web reviews, (iii) specification sheets, and (iv) web ratings; and

display, by the application in the AR GUI, the web-based information proximate to the respective filtered plurality of products.

13. The computer-readable storage medium of claim 10, wherein the one or more profile-relevant in-store customer comments and/or reviews are in-store customer

comments and/or reviews corresponding to the plurality of products meet the following criteria: (i) previously purchased products, (ii) products related to a meal plan set by the user, (iii) products comporting with a dietary restriction of the user, (iv) product allowed under a diet the user is on, (v) products related to a favorite snack of the user, (vi) product related to a favorite seasonal fruit of the user, (vii) products related to a favorite protein of the user, (viii) discounted products or specials on products specified by the user, (ix) products related to frequently purchased products by the user, (x) products recommended by a personal shopper system associated with the user, and (xi) products meeting a threshold product rating set by the user.

14. The computer-readable storage medium of claim 10, wherein determining the relevant product information comprises: (i) analyzing past financial transactions made by the user via the contactless card at the store, (ii) determining one or more shopping patterns and one or more budget-related preferences in the analyzed financial transactions and whether the one or more shopping patterns and the one or more budget-related preferences relate to any of the plurality of products with the product information, and (iii) determining whether there is a predetermined price not to be exceeded for a specific item and determining, for each of the plurality of products, whether the product relates to the specific item and whether the product exceeds the predetermined price.

15. The computer-readable storage medium of claim 10, wherein the overlaid product information are color coded in a first color to indicate a first type of information and in a second color different from the first color to indicate a second type of information different from the first type of information, wherein the first type of information indicates that the one or more relevant in-store customer comments and/or reviews are positive and the second type of information indicates that the one or more relevant in-store customer comments and/or reviews are negative, wherein the authentication of the user via the contactless card automatically logs the user into the application and allows the user to enter a review of the plurality of products via the application.

16. A computing apparatus comprising:

a processor; and

a memory storing instructions that, when executed by the processor, cause the processor to:

- receive encrypted authentication data from a contactless card of a user;
- transmit, to an authentication server, a one-tap authentication request comprising the encrypted authentication data to authenticate the user based on the encrypted authentication data;
- receive, from the authentication server, a one-tap authentication confirmation specifying the authentication server decrypted the encrypted authentication data to authenticate the user;
- access a personal profile associated with the user based at least in part on the one-tap authentication confirmation, wherein the personal profile is associated with the contactless card;
- receive one or more product identification numbers from one or more tags in a store;
- receive, from the one or more tags, product information associated with a plurality of products based on the received product identification numbers, wherein the product information comprises in-store customer comments and/or reviews corresponding to the plurality of products;
- determine product information corresponding to the product identification numbers that is relevant to the user to generate relevant product information;
- generate a filtered plurality of products by filtering a first product of the plurality of products based on a determination that the first product is not relevant to the user;
- launch, based on the one-tap authentication confirmation, an application including an augmented reality (AR) graphical user interface (GUI); and
- overlay, by the application, the relevant product information of the filtered plurality of products in the AR GUI proximate to the filtered plurality of products.

17. The computing apparatus of claim 16, wherein the instructions further cause the processor to:

detect one or more signals from the one or more tags in the store, wherein the tags include radio frequency identification (RFID) tags or near-field communication (NFC) tags, wherein the signals are detected by RFID readers or NFC readers.

18. The computing apparatus of claim 16, wherein the instructions further cause the processor to:

receive web-based information corresponding to the plurality of products based at least in part on the product information, wherein the web-based information comprises: (i) images of items in each of the plurality of products such that the items are viewable outside a packaging of each product, (ii) web reviews, (iii) specification sheets, and (iv) web ratings; and

display, by the application in the AR GUI, the web-based information proximate to the respective filtered plurality of products.

19. The computing apparatus of claim 16, wherein the one or more relevant in-store customer comments and/or reviews are in-store customer comments and/or reviews corresponding to the plurality of products meeting the following criteria: (i) previously purchased products, (ii) products related to a meal plan set by the user, (iii) products comporting with a dietary restriction of the user, (iv) product allowed under a diet the user is on, (v) products related to a favorite snack of the user, (vi) product related to a favorite seasonal fruit of the user, (vii) products related to a favorite protein of the user, (viii) discounted products or specials on products specified by the user, (ix) products related to frequently purchased products by the user, (x) products recommended by a personal shopper system associated with the user, and (xi) products meeting a threshold product rating set by the user.

20. The computing apparatus of claim 16, wherein determining the relevant product information comprises: (i) analyzing past financial transactions made by the user via the contactless card at the store, (ii) determining one or more shopping patterns and one or more budget-related preferences in the analyzed financial transactions and whether the one or more shopping patterns and the one or more budget-related preferences relate to any of the plurality of products with the product information, and

(iii) determining whether there is a predetermined price not to be exceeded for a specific item and determining, for each of the plurality of products, whether the product relates to the specific item and whether the product exceeds the predetermined price.