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Image recognition for consumer shopping applications

Jibing Wang

Erik Stauffer

Aamir Akram

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ABSTRACT

This disclosure utilizes image recognition techniques in consumer retail applications. Objects in an image are recognized and corresponding retail information, e.g., links to purchase an object, is provided to users. Image recognition techniques are integrated into point of sale applications and utilized for product identification based on a barcode, a QR code, based on the image of the product, etc. Application program interfaces are provided to link the image recognition application with payment processing and inventory management systems.

KEYWORDS

- inventory management
- object recognition
- visual commerce
- point of sale (POS)
- barcode
- payment processing

BACKGROUND

Image recognition techniques are commonly utilized for object and location recognition. Image recognition software is typically provided via user devices such as smartphones. Using such software, users are able to obtain information regarding various objects by simply pointing the device camera at the object. Such information can include, e.g., name and descriptive information, location identification, search results, etc. Image recognition techniques are now available on end-user devices such as smartphones, e.g., via a virtual assistant application, as part of the device operating system, as part of a camera or image library application etc.

DESCRIPTION

This disclosure utilizes image recognition techniques in consumer retail applications such as electronic commerce (online shopping), point of sale (POS) applications, etc.
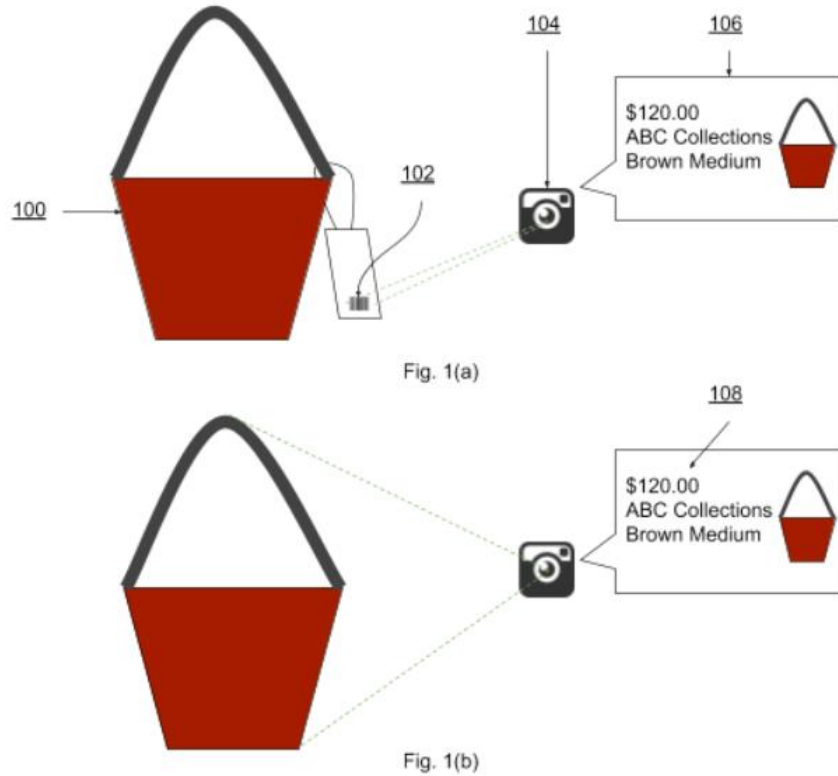

Fig. 1: Image recognition in shopping applications

Figs. 1(a) and 1(b) depict examples of image recognition techniques being utilized in a shopping setting. Fig. 1(a) depicts a handbag (100) with an attached tag (102) that includes a barcode. When a user points a camera of their user device (104) at the barcode, the barcode is recognized. Based on the recognized barcode, information relating to the handbag such as a link to an online store where the handbag is available for purchase, price information, color and size options, etc. is provided to the user (106). The user device can be any type of device, e.g.,

smartphone or tablet device (e.g., configured as a point-of-sale device), a conventional point-of-sale terminal that includes a camera, a shopper's personal device, etc.

Fig. 1(b) depicts a similar example, in which the camera is pointed directly at the handbag. Image recognition is used to determine the particular type of handbag and provide the user with information (108) even when a barcode is unavailable. Use of such techniques can eliminate the need for manual product lookup via a SKU or other code and can also eliminate the need to include barcode tags on products.
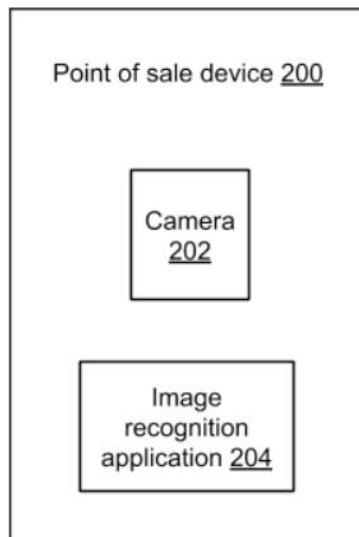
```
┌─────────────────────────────────┐
│ Point of sale device 200        │
│                                 │
│                                 │
│        ┌──────────────┐         │
│        │              │         │
│        │   Camera     │         │
│        │    202       │         │
│        │              │         │
│        └──────────────┘         │
│                                 │
│      ┌──────────────────┐       │
│      │      Image       │       │
│      │   recognition    │       │
│      │ application 204   │       │
│      └──────────────────┘       │
│                                 │
└─────────────────────────────────┘
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Fig. 2: Image recognition integrated into a point of sale (POS) application

Fig. 2 illustrates the use of image recognition techniques integrated into a point of sale (POS) application (200). A POS device (200) implements the techniques, e.g., as part of a retail checkout application. The POS device includes or is coupled to a camera (202) and an image recognition application (204). The application enables product identification based on a barcode, a QR code, or based on the product itself, and supports various types of scenarios where the

barcode/QR code is missing or illegible. The POS device is set up to access product databases to provide additional information such as mislabeled items.

An application program interface (API) is provided to allow integration with third-party applications, e.g., a retailer's product inventory system. The API enables additional functionality such as storing of product images, identification of damaged items, etc. Integration with payment systems application allows payment processing. When the user provides consent, the image processing application can also be utilized for customer identity verification.

Further to the descriptions above, a user may be provided with controls allowing the user to make an election as to both if and when systems, programs or features described herein may enable collection of user information (e.g., information about a user's social network, social actions or activities, profession, a user's preferences, or a user's current location), and if the user is sent content or communications from a server. In addition, certain data may be treated in one or more ways before it is stored or used, so that personally identifiable information is removed. For example, a user's identity may be treated so that no personally identifiable information can be determined for the user, or a user's geographic location may be generalized where location information is obtained (such as to a city, ZIP code, or state level), so that a particular location of a user cannot be determined. Thus, the user may have control over what information is collected about the user, how that information is used, and what information is provided to the user.

CONCLUSION

This disclosure utilizes image recognition techniques in consumer retail applications. Objects in an image are recognized and corresponding retail information, e.g., links to purchase an object, is provided to users. Image recognition techniques are integrated into point of sale applications and utilized for product identification based on a barcode, a QR code, based on the

image of the product, etc. Application program interfaces are provided to link the image

recognition application with payment processing and inventory management systems.

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