Smart Fashion Recommender Application

Abstract :

In recent years, the textile and fashion industries have witnessed an enormous amount of growth in fast fashion. On e-commerce platforms, where numerous choices are available, an efficient recommendation system is required to sort, order, and efficiently convey relevant product content or information to users. Image-based fashion recommendation systems (FRSs) attracted a huge amount of attention from fast fashion retailers as they provide a personalized shoping experience to consumers. With the technological advancements, this branch of artificial intelligence exhibits a tremendous amount of potential in image processing, parsing, classification, segmentation. Despite its huge potential, the number of academic articles on this topic is limited. The available studies do not provide a rigorous review of fashion recommendation systems and the corresponding filtering techniques. To the best of the authors' knowledge, this is the first scholarly article to review the state-of-the-art fashion recommendation systems and the corresponding filtering techniques. In addition, this review also explores various potential models that could be implemented to develop fashion recommendation systems in the future. This paper will help researchers, academics, and practitioners who are interested in machine learning, computer vision, and fashion retailing to understand the characteristics of the different fashion recommendation systems.

Keywords :

Fashion recommendation system, E-commerce, Filtering techniques, Algorithmic models, Performance

Software Requirements :

- Frontend – Html, css, vanilla, javascript
- Backend – Flask(Python), SendGrid
- Database – IBM DB2

Technologies In Trend :

QR Codes :

- Place Shopcodes next to product shelving so in-store shoppers can complete their purchase via your website or social media storefront. (This endless aisle approach appeals to the 74% of shoppers who consult their smartphone while shopping in-store.)
- Add QR codes to paper receipts, and direct shoppers towards completing a survey or leaving a review.
- When your store hits capacity, encourage shoppers to scan a QR code and join the virtual queue. They'll get a text when it's their turn to enter.
- Create interactive window displays by placing Shopcodes in your storefront window.

RFID technology :

RFID technology exists to solve that problem—or at least the amount of time you spend counting store inventory. Scan RFID tags, small chips that transmit product data to a portable reader, and update stock levels in your inventory management system within just a few seconds.

Smart checkout :

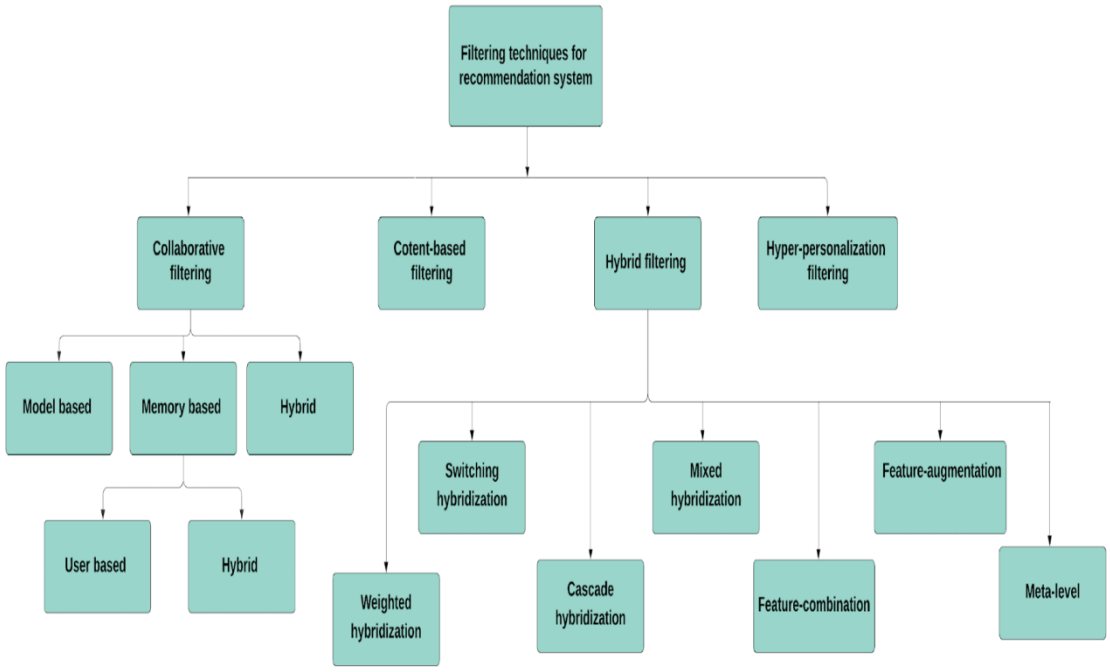
- **Contactless payment.** Contactless technology is speeding up the payment process. Shoppers can tap their credit card or mobile device onto a payment terminal, pay for their products, and leave the store within just a few seconds.
- **Payment installations.** Almost one-third of shoppers admit to abandoning a purchase because they couldn't use their preferred payment method. Buy now, pay later (BNPL) is increasing in popularity. Help customers finance expensive purchases by allowing them to pay in installments.
- **Ship to home.** Not all customers can take in-store purchases home with them. Whether the item's out of stock or simply too heavy to carry home, take payment in-store and ship the item directly to the customer's shipping address.
- **Digital receipts.** Research shows 63% of consumers would rather shop with retailers who reduce the need for consumables. Another 58% would shop with merchants who take steps to lower their carbon footprint. Reduce paper waste and collect customer data by emailing a copy of their receipt.
- **Self-checkout.** Customers prefer unattended retail because they can shop at their own pace. Continue that experience through to self-checkout with technology like Mashgin.

Store management :

- **Payroll.** Pay your employees on time by automating payroll. Add their salary, plus tips and commissions, with Shopify apps like Gusto.
- **Staff scheduling.** "The pandemic has helped increase business usage of technology that helps them manage their workforce remotely, through things like time attendance, scheduling and communications," says Damien Tampling, Global Chief Strategy Officer at Xero. "Planday is a good example of this, which is helping businesses manage their day from a single platform."

- **Retail analytics.** Understand store performance better with apps like Dor. Its thermal-sensing camera tracks how many people enter your store, and connects the traffic data with revenue from your POS system. Find peak times, optimal team rotations, and local marketing campaign impact.

Block Diagram :



Literature Survey :

McAuley Et Al

Devised a parametric distance transformation that assigns a lower distance to garment pairings that fit well than to those that do not. And provided Image-based recommendations on
styles and substitutes.

Hu Et Al

Conducted a preliminary investigation into personalised outfit recommendation. To describe the user-item and item-item interactions, a functional tensor factorization method was presented. They proposed A functional tensor factorization approach.

Thombre in

Used image segmentation and Kalman filter to realize Human detection and tracking.

Orrite-Urunuela proposed a statistical model for detection and tracking of human silhouette and the corresponding 3D skeletal structure in gait sequences .

Veit et al.

Learned feature transformation for a compatibility measure between pairs of objects using a Siamese CNN architecture. All of these works focused solely on the compatibility of two things. Furthermore, they simply modelled broad matching criteria and ignored the issue of personalisation.

Ajmani et al

Present a novel method for content-based recommendation of media-rich commodities with the use of probabilistic multimedia ontology. Proposed an ontology based personalized garment recommendation system.

Li et al

Utilized the HMM of recommended items to match customers' model according to customer data. The second method is the collaborative filtering-based recommendations algorithm. Proposed Content-Based Filtering Recommendation Algorithm.

Nogueira et al

Presented a new collaborative filtering strategy that utilizes the visual attention to characterize images and alleviate the new item cold-start problem. The rule-based recommendation algorithm is the third method.

Hwang et al

Put forward a method to generate the automatic rules with the user's items and made a suggestion on the best rule. The fourth method is the utility-based recommendation.

Scholz et al

Found that exponential utility functions are better geared to predicting optimal recommendation ranks for products, and linear utility functions perform much better in estimating customers' willingness.

Koenig

Developed a system toward real-time human detection and tracking in diverse environments. However, mostly the researchers focus on the point of human detection and tracking in complex scene, while refined contour extraction of human in dynamic scene is still an open question

Future Scope :

1. There has been significant progress recently in fashion recommendation system research, which will benefit both consumers and retailers soon. The use of product and user images, textual content, demographic history, and cultural information is crucial in developing recommendation frameworks. Product attributes and clothing style matching are common features of collaborative and content-based filtering techniques.

2. Researchers develop more sophisticated hyperpersonalized filtering techniques considering the correlation between consumers' clothing styles and personalities.

3. The use of virtual sales advisers in an online shopping portal would provide consumers with a real time offline shopping experience.

4. Retailers can collect the data on users' purchase history and product reviews from the recommendation system and subsequently use them in style prediction for the upcoming seasons.

Conclusion :

Recommendation systems have the potential to explore new opportunities for retailers by enabling them to provide customized recommendations to consumers based on information retrieved from the Internet.

They help consumers to instantly find the products and services that closely match with their choices. Moreover, different stat-of-the-art algorithms have been developed to recommend products based on users' interactions with their social groups.

Therefore, research on embedding social media images within fashion recommendation systems has gained huge popularity in recent times.

This paper presented a review of the fashion recommendation systems, algorithmic models and filtering techniques based on the academic articles related to this topic. The technical aspects, strengths and weaknesses of the filtering techniques have been discussed elaborately, which will help future researchers gain an in-depth understanding of fashion recommender systems.

However, the proposed prototypes should be tested in commercial applications to understand their feasibility and accuracy in the retail market, because inaccurate recommendations can produce a negative impact on a customer.

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