

3D data and stereo projection system combined with “Yuan” shopping applet

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Abstract. This project emerged in the context of the metaverse. We combine 3D data and stereoscopic projection to collect data on traditional shopping and people's views on online shopping today. We launch the "Yuan" shopping plan and are committed to creating a WeChat mini program that combines 3D data and stereoscopic projection. Digitize the products, utilize data, and use stereo projection technology to allow users to visually see the products, thereby bringing people a wonderful and brand new shopping experience, allowing consumers to better understand the adaptability of the products and improve shopping efficiency.

Keywords: 3D data, stereoscopic projection system, “Yuan” small shopping procedures.

1. Introduction

With the advancement of technology, the metaverse technology experienced explosive growth at the end of 2021. The concept of meta universe is specifically defined as "a collective virtual shared space, created by the integration of virtual enhanced physical reality and physical persistent virtual space, including the sum of all virtual worlds, augmented reality and the Internet"^[1]. The progress and development of science and technology will inevitably have a huge impact on our lives and work. The combination of 3D data and stereo projection technology in the "yuan" shopping program will promote people to shop more efficiently. We can present our procurement needs and goals more intuitively on the shopping platform.

The combination of 3D data and stereo projection technology can digitize products, construct more intuitive product effects through data, and the cutting-edge stereo projection technology will inevitably provide users with a brand new intuitive shopping experience. Users can use the "Yuan" shopping mini program to make them feel like they are in a physical store, giving them a more realistic and accurate impression, and helping them make more accurate purchasing decisions, thereby saving people's shopping time, meeting their growing shopping needs, and enhancing the experience of online shopping.

2. Methods

2.1 Data collection

We use the method of sampling and questionnaire to survey different groups, such as students, teachers, to get project research data, at the same time through online shopping data crawling, get the later “Yuan” shopping applet needs to be rendered 3D data. Figure 1 simulates a browser by writing programs or scripts that systematically and automatically browse the World Wide Web, scraping web page information or specific data in bulk on the internet^[2]. Through the use of different software for data processing, such as SPSS, MySQL, to build small 3D shopping database. Not only that, we update the data in the database in real time to facilitate the following consumer information and information in the database for adaptation analysis, like algorithm analysis to recommend to users for consumer diversification of goods, to provide users with more choices of goods, for customers to bring a good experience. Database creation as shown in Figure 2, the database can well meet the needs of user personalization, but also provides more advantages than traditional databases, for example, retrieval is simpler, cost is lower, storage capacity is higher, share level is higher and so on^[3].

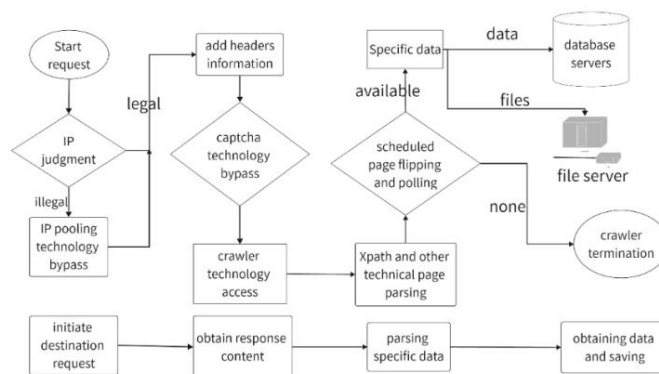


Figure 1 Web crawler flowchart

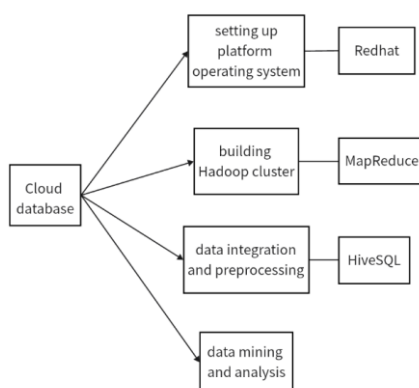


Figure 2 Database creation model

2.2 Personalized recommendation system

A personalized recommender system is used to describe user interest and item attributes with the help of multi-modal auxiliary information. By analyzing the content forms and descriptive meanings of many kinds of subsidiary information, the subsidiary information is abstracted into discrete and continuous types. For discrete information, an adaptive fusion network based on attention mechanism is proposed, which automatically learns weights and merges multiple discrete features to enrich user interest or object attributes. For the continuous model, the migration pre-training model, such as image processing VGG16, is used to extract the deep semantic feature representation of the image, which is used to calibrate the characterization of users or objects in the training phase. The experimental results demonstrate that the proposed method can reduce the data sparsity and improve the accuracy of recommendation results [4].

The personalized recommendation system is applied to the shopping small program, through the user input display data and implicit data, can recommend to the user the products that meet the user's needs, including content recommendation, knowledge recommendation, hybrid recommendation, Figure 3 and Figure 4 personalizes the recommendation can be very good to meet people's shopping needs.

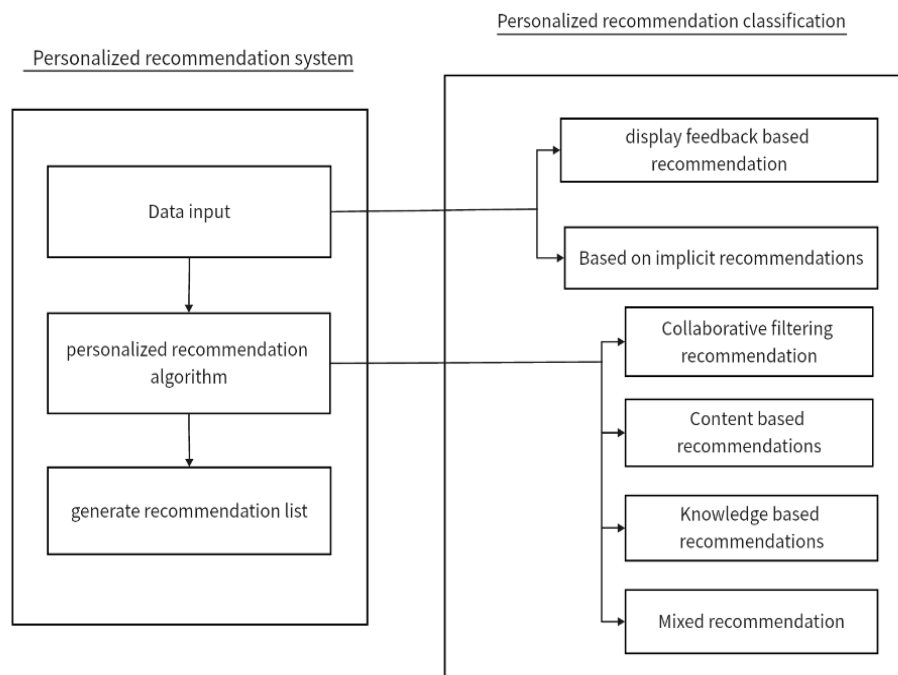


Figure 3 Flow chart of personalized recommendation system

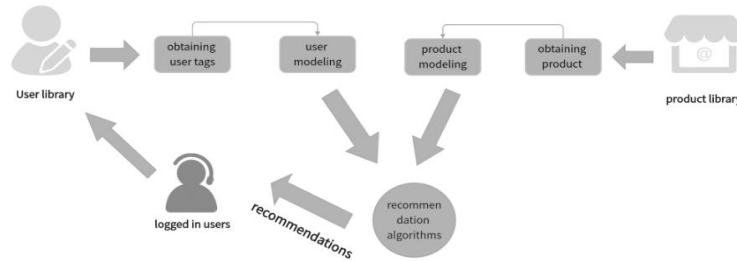


Figure 4 Personalizes the recommendation

2.3 Stereoscopic projection system

Stereoscopic projection technology uses the principle as follows: human left and right eyes from a variety of angles, the same object in both eyes in the retina to observe the horizontal parallax. In the process of three-dimensional display, we should use artificial way to deal with this level error. For example, an image of the left eye is transmitted to the observer's left eye^[5], and an image of the right eye is transmitted to the observer's right eye, ensuring that the observer is physically able to feel the depth of the three-dimensional space, thus creating a realistic sense of the three-dimensional space. As shown in Figure 5, at present, there are many kinds of three-dimensional display technology, and the popular and mature three-dimensional display technology is stereoscopic display technology in wearing glasses mode^[6].

We applied the stereoscopic projection system to the “Yuan” shopping wechat small program, and combined with the three-dimensional data collected, could well display the three-dimensional state of the products purchased by users, not only convenient for the sale of goods, but also enhance the consumer's desire to greatly meet the consumer's shopping experience.

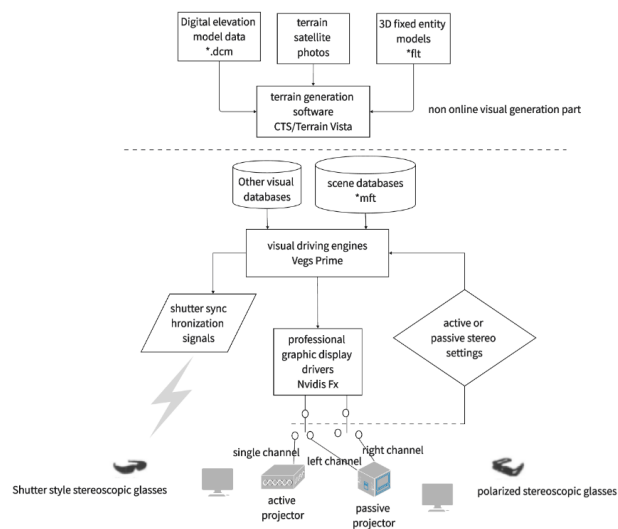


Figure 5 The virtual scene stereoscopic display system architecture diagram

3. Result

3.1 Crawler-based data collection

Using Python software, through the way of crawling, using the URL address of the crawl data, to this URL, and then get the response data from this URL server, in accordance with the requirements of Web crawler standards, in a specific order and principles to get the web page information into the URL parts to be grabbed, the process has been repeated until the information captured to meet the requirements of the system, before stopping the above-mentioned action, then the data information obtained by the crawl will be filtered and summarized, while building a search engine^[7], put it into a database or folder, and finally according to the specific query needs^[8], from the database or folder to retrieve the required data information, and the data information through the text of the way presented, and then download, so as to get different shopping data^[9]. Then you need to crawl the data to clean, and finally get the project can use the data, such as Table 1, to facilitate the construction of the subsequent database.

Table 1 Partial data table crawled

Product Name	Product Price	Number of Payers	store	shipping address
Hot Wind Women's Shoes 2020 Summer New Women's High Heel Matsuke Thick Sole Beach Fashion Sandals	159	17 Person Payment	Chuangduo Flagship Store	Shanghai
TS Paisu Spring New Product Vintage Canvas Tire Cowhide Spliced Pointed Middle Heel Shallow Mouth Single Shoes	699	11Person Payment	Chuangduo Flagship Store	Guangdong Guangzhou
Yang Mi Same Style SW Sandals Women's Banquet Shoes One line Buckle Thin Heel Slim and Versatile Fashion Brand Open Toe High Heels Leather	328	441Person Payment	Chuangduo Flagship Store	Fujian Xiamen
Hong Kong fashion brand thick soled sandals for women in the summer of 2020, new slope heel genuine leather sponge cake, one line buckle high heel open toe women's shoes	328	1000Person Payment	Chuangduo Flagship Store	Shanghai
Square toe single shoes, women's thick heels, new versatile small heel shoes for autumn 2020, with a square buckle high heel and a thick heel of 5cm	488	698Person Payment	Chuangduo Flagship Store	Fujian Xiamen
One word crystal high heels sandals, 2020 new internet celebrity, same sexy slippers, women's summer outerwear with thick heels, transparent	468	1172Person Payment	Chuangduo Flagship Store	Fujian Xiamen

Pointed suede high heels for women in autumn 2020, new European and American versatile slim heel shoes, bridesmaids, internet red nude single shoes	528	267Person Payment	Chuangduo Flagship Store	Fujian Xiamen
High Heel Shoes for Women with Thin Heels 2020 New Versatile Net Red Nude Color Sexy Light Mouth Pointed Patent Leather Single Shoes Wedding Shoes for Women	498	291Person Payment	Chuangduo Flagship Store	Fujian Xiamen
French High Heels Women's 2020 New Naked Color Thin Heels Internet Red Single Shoes Women's Square Head Metal Square Buckle Mid Heel Wedding Shoes	568	567Person Payment	Chuangduo Flagship Store	Fujian Xiamen

3.2 “Yuan” shopping small program basic framework design

From the data collected, project members discussed the design of the project solution and the design style that the applet should have, as shown in Figure 6 “Yuan” shopping small program frame design. According to the relevant data collected, but also the collection of different shopping software design features, designed a reasonable, convenient “Yuan” shopping mini-program of the basic framework of the various parts, such as Figure 7 “Yuan” small shopping program interface map, facilitate the subsequent development of small program and improve the small program needs of the function.

The “Yuan” shopping app contains four sections. The first section is the home page, which contains the function of searching and displaying the goods list. The second section is the shopping center, which has the categories of displaying goods, the third section is the shopping cart, which contains the information of the user's address and pre-purchased goods. The fourth section is the personal center, can meet the user login and display the function of user information^[10].



Figure 6 “Yuan” shopping small program frame design

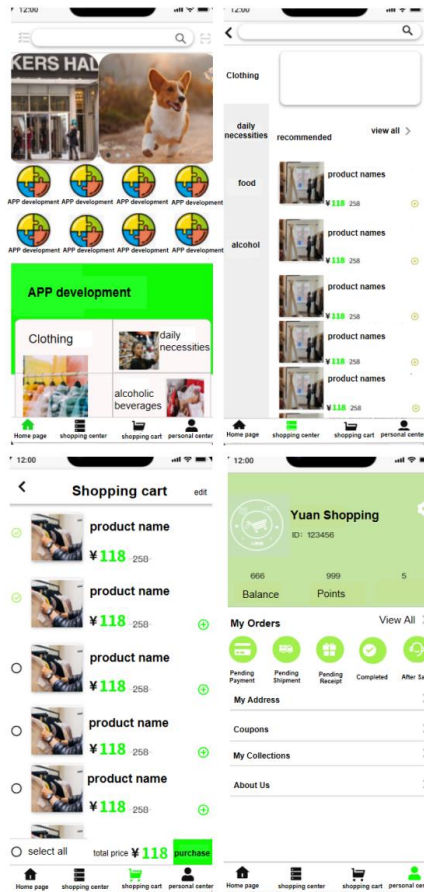


Figure 7 “Yuan”small shopping program interface map

3.3 “Yuan” shopping small program developments

Has completed the development of “Yuan” shopping small program, mainly through wechat developer tools and HBuilder x two software to complete the small program construction and development, is based on Vue. JS to develop a cross-platform application front-end framework uni-app to write the code, each page in the form of a vue file. In this small program, each page with the corresponding JS, JSON, WXSS and WXML files. Among them, JS file is used to store variables and methods defined by the applet; JSON file is used to store the access path of each page; wxss file is used to store the style of the applet page; WXML file is used for page layout, finally, the small program front-end interface development, as shown in Figure 8. Through the early design of “Yuan”shopping applet UI interface to design “Yuan” shopping applet interface of different styles, create a small program in line with the project. Project members to test the initial version of the small program, to facilitate the release of the initial version of the small program to promote the use of this stage, select some users for internal testing, experience small programs and equipment, at the same time from the collection of user feedback information data constantly optimized, and constantly improve the relevant functions of the small program^[11].

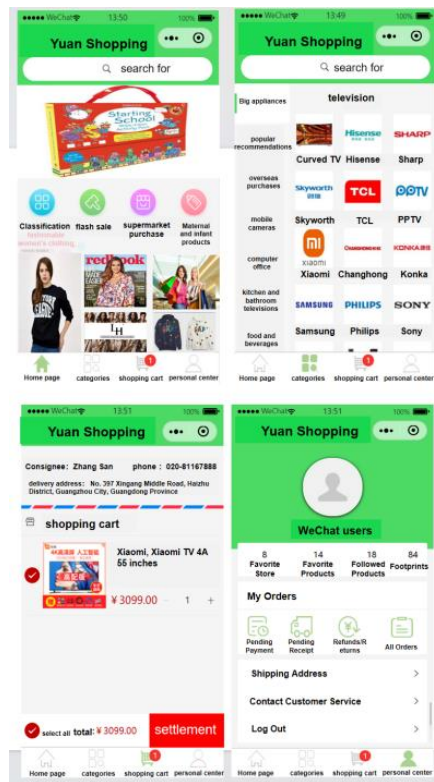


Figure 8 “Yuan” shopping applet development interface

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