

SMART E-SHOPPING SIMULATING A REAL-TIME SHOPPING EXPERIENCE

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Abstract—

Online shopping refers to E-commerce business where merchants deal with customers over internet through admin. It is designed from the user point of view, which is friendly and understandable. A catalog containing list of different products is used from where customers can choose their respective products and purchase them from stores. In this paper, we propose a smart shopping site which is user friendly with all new improvisations. Taking into account the drawbacks of online shopping we propose a extemporized smart e-shop with features such as tactile effect to get the feel and texture of online goodies, experience the feel of wearing clothes virtually, get suggestions from peeps or bargain with the seller via a chat room, get our rent clothes to look dazzling at occasions and blackle effect to give rise to green computing. Our proposed site also supports relevance searching.

Keywords : *virtual fitting, skeletal based warping, Query Spectrum; Query Qualifiers; Query Structure; black surfing; haptic effect ; virtual chat room.*

I. INTRODUCTION

A. E-COMMERCE

Ecommerce (or electric commerce) refers to the buying and selling of goods and services via electronic channels, primarily the Internet. Electronic commerce draws on technologies such as mobile commerce, electronic funds transfer, supply chain management, Internet marketing, online transaction processing, electronic data interchange (EDI), inventory management systems, and automated data collection systems. Modern electronic commerce typically uses the World Wide Web for at least one part of the transaction's life cycle, although it may also use other technologies such as e-mail.

B. ONLINE SHOPPING

Online shopping has revolutionized the business world by making everything anyone could want available by the simple click of a mouse button. Online shopping (sometimes known as e-tail from "electronic retail" or e-shopping) is a form of electronic commerce which allows consumers to directly buy goods or services from a seller over the Internet using a web browser. Alternative names are: e-web-store, e-shop, e-store, Internet shop, web-shop, web-store, online store, online storefront and virtual store. Mobile commerce (or m-commerce) describes purchasing from an online retailer's mobile optimized online site or app. Number of digital shoppers in the United States from 2010 to 2018 (in millions) is shown in Figure --1 : This timeline shows the number of online shoppers in the United States since 2010. In 2013, 191.1 million U.S. citizens were online shoppers and had browsed products, compared prices or bought merchandise online at least once. These figures are projected to surpass 200 million in 2015

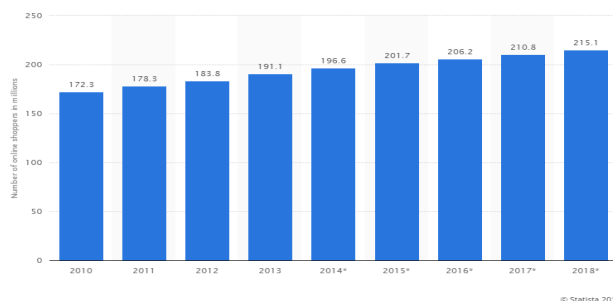


Figure 1 – statistics on number of digital shoppers over the last decade

II. ADVANTAGES OF E-SHOPPING

- **It makes products easy to find:**

Finding a product online is much easier than looking for it in the local store where it is frustrating and time-consuming. However, online you can easily search for any product by using the website's search feature. For example, if you can't find the suitable product in eBay, you can look for it on Amazon.

- **Products are often more inexpensive:**

Products are often cheaper online than they are in stores. There are several reasons for this. For one, an online store doesn't have the overhead costs of renting their location and paying for the electricity, AC, cashiers, etc. Also, sometimes a product can be much cheaper in another country than your country.

- **It saves time and energy:**

You don't have to waste your time going to stores, dealing with crowds, and standing in lines.

- **Shopping online gives you access to a wider range of options:**

You have great freedom of choice when you shop online. The Internet provides a far wider range of products than that you would find in any local store.

- **It's easier to hunt for a great deal:**

You will also be able to enjoy the freedom of price flexibility. If you don't like the price of a product from an online shop, you can switch to another to look for a cheaper price.

- **Customers are usually satisfied:**

Nowadays, shopping online is very reliable. Sellers are held accountable by user feedback and reviews.

- **There is buyer protection:**

Dependable websites provide buyer protection. This means that the website will give your money back if any seller fails to deliver the item or delivers an item that does not match the description.

- **It's easier to find rare products:**

Shopping online is very useful in buying rare products.

- **Shopping online allows you privacy:**

There are some things that you just don't want to buy publicly. You can buy any kind of product online while maintaining your privacy.

- **You can support e-businesses:**

The progress of online business is actually helping countless people. Now people who cannot afford to buy or rent a shop can easily open an online store and sell items from their homes. This is playing a very important role in reducing the unemployment rate.

III. PROSPECTIVE TECHNOLOGIES TO EMPOWER e-COMMERCE

A. TANGIBILITY THROUGH HAPTIC EFFECT

That moment when you touch and feel the thing you want to own, it is something irreplaceable. In case of clothes and shoes, you can touch the item and understand how good or bad a material it has been made of. When it comes to gadgets, during a real shopping experience, you can try them out and know if they are working properly.

How it works ?

Haptic display ^[4] is the process of applying forces to a human "observer" giving the sensation of touching and interacting with real physical objects. A haptic display system has three main components. The first is the haptic interface, or display device, generally some type of electro-mechanical system able to exert controllable forces on the user with one or more degrees of freedom. The second is the object model—a mathematical representation of the object containing its shape and other properties related to the way it feels. The third component, the haptic rendering algorithm, joins the first two components to compute, in real time, the model-based forces to give the user the sensation of touching the simulated objects. This paper focuses on a new haptic rendering algorithm for generating convincing interaction forces for objects modeled as rigid polyhedral. We create a virtual model of the haptic interface, called the god-object, which conforms to the virtual environment. The haptic interface can then be served to this virtual model. This algorithm is extensible to other functional descriptions and lays the groundwork for displaying not only shape information, but surface properties such as friction and compliance.

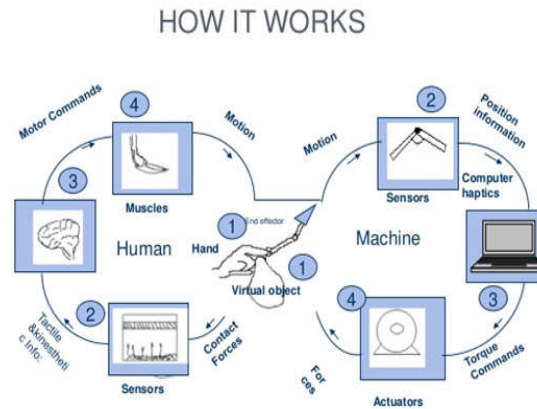


Figure –2 working of haptic effect

B. RELEVANCE SEARCHING

When users search in an **e-commerce context**, they are mostly looking for products. This prompts users to search differently than they do when performing generic web searches. In particular, users will often include one or more criteria in their search which the product must meet.

- **Query Spectrum** - “*setting the search range*” – The query spectrum defines the range of the search, specifying the domain of products that are of interest. It thus provides the base of the search query.
- **Query Qualifiers** - “*delineating the search boundaries*” – Query qualifiers are used to refine the boundaries of the query spectrum by specifying various conditions that the products should meet.
- **Query Structure** - “*constructing the query*” – The structure of the query determines how it should be interpreted by the search engine and includes the syntax and context of the query.

C. VIRTUAL FITTING

The buyer often has to imagine how the outfits and accessories will suit them in real-time. So bringing it to realization is what this part deals with. We propose an image-based approach for virtual clothes fitting,^[1] in which a user moves freely in front of a virtual mirror (i.e video screen) that displays the user wearing a superimposed virtual garment. Typically, a camera captures the user standing in front of a screen that shows a real-time visualization of him/her wearing the virtual garment. A skeleton based warping technique and optical flow based frame interpolation to address this problem to provide the user with a visually natural clothes fitting experience. This approach is implemented using a Microsoft Kinect camera to measure character poses. From a dataset of captured video clips with a garment in different configurations and undergoing various motions, we synthesize arbitrary animations of the garment by rearranging the temporal order of video frames through an optimization framework.



Figure 3— virtual fit based on skeletal pose

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OBJECTIVE FUNCTION

$$E = \sum_i D(l_i, i) + \lambda \sum_i S(l_{i-1}, l_i)$$

Where,

l_i → index of the selected database frame for the i^{th} frame in the input video.

$D(l_i, i)$ → Euclidean distance between the pose vectors of l_i and i .

$S(l_{i-1}, l_i)$ → set to zero when l_{i-1} and l_i are neighboring frames in a database clip; otherwise it is set to one

λ → fixed parameter (100 in our implementation)

D. GO GREEN WITH BLACK SURFING

E-Commerce sites have been the most fetched sites among all of its type. If at all energy can be saved, it is the best approach to start from this place where potentiality is vast, citing the statistics provided. It could not only trade off cost but also promotes green technology. This step towards green computing starts with implementing black surfing in online shopping websites.

Black surfing is surfing search engine results using an inverted palette, with white text on a black body. Shifting a high traffic website, like Google, from a white background to a black background can save substantial energy. An all-white web page uses about 74 watts to display on a CRT monitor as compared to an all-black page that uses only 59 watts^[5]. The effectiveness of using the 'black web' technique to save energy is a subject of intense debate, much of which centers on the pros and cons of a specific implementation, and the scale at which the approach is implemented.

SUGGESTEDSITES

- Darkoogle, uses a black background with green text.
- Blackle, uses black background and adopts google custom search
- Earthle
- GreenerGle
- Greygle, uses a grey background.
- Google Black, is a website hosted by the Google-owned blogspot, however the search results are not in black.
- Jabago, uses a black background and allows for searching in many languages.
- Ninja
- Power Google
- Searchincolor.com, an older site that supports Google colored searches since its onset. The default color is black.
- Trek Black

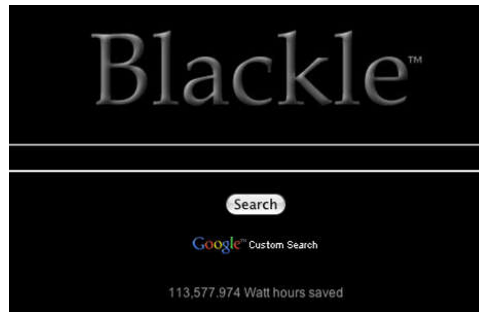


Figure –4 blackle search engine

E. A REAL-TIME ENVIRONMENT

The online shoppers face a huge dissatisfying moment when they cannot negotiate the products' cost with the sellers. This deprives them of the buyer's rights and therefore it is a need of the hour to have seller-buyer interaction in virtual stores. Thus a chat room can satisfy this constraint and buyers can gather as many information about the product from the live interaction rather than searching in feedbacks.

The buyers can also share the personally fitted product (mentioned in virtual fitting) to their friends for suggestions and optimizing their choice by way of chat room and that creates a shopping experience at its realized environment.

A chat room is very similar to Instant Messaging (IM) but instead of one-to-one communication, users log on to a themed based virtual room and communicate with several people only known by their screen names. By sending typed messages to the room all connected users can read and respond like a big online get together.

IV. CONCLUSION

Online shopping is a different experience and you can make the shopping creative over the internet as you get used to it. There can be lot of apprehensions about online shopping when you get in to it for the first time. With all these explained techniques, e-Retail sector will become a booming factor in computer economy. As you experience more and more of it those apprehensions get disappeared slowly. Remember that if you stick to the basics, online shopping become more enjoyable and easier than real-world shopping. The potential of ecommerce has experienced a huge hike due to online shopping. In the near future there would be virtualization everywhere.

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