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Translating the need for touch to online fashion shopping via digital technology

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Abstract

Online shopping for fashion has seen explosive growth in recent times but the sector still faces the challenge of translating the in-store experience to the online environment. Clothing has been classified as a high-involvement product category that needs to be seen, tried on and touched to be evaluated (Workman, 2010) and the lack of tactile input online presents a challenge for retailers. Although fashion is a growing category in e-commerce, returns rates are currently around 25% and represent a significant cost to the business (Retail Week, 2012).

Developments in digital technologies and new user interfaces go some way towards translating the in-store experience to the online environment, through object interactivity, virtual try-on, mix and match function etc. Such image interactivity technology (IIT) enables consumers to manipulate product images on a retailer's website (Fiore et al, 2005). This provides enriched product information for the user (Merle et al, 2012) and thus reduces the sensory deprivation typically associated with the online browsing experience. Much existing research on IIT in online fashion is based on a desktop browsing experience. However, with the growth in m-commerce and use of tablets for online browsing, there is justification in moving the study of IIT away from desktops and onto touchscreen devices. Touchscreen devices allow users to directly manipulate objects on the screen, using single or multi-finger gestures such as tapping, sliding and pinching, and thus the retail browsing experience is richer and more intuitive than on a desktop.

The objective of this study is to explore how increasing levels of object interactivity on touchscreen devices translate the need for tactile input to the online environment and affect (a) consumer perceptions of risk when shopping for fashion online and (b) consumer engagement with online fashion shopping. Using a lab-based experimental design, we will test the effects of a new image interactivity technology developed by computer scientists at Heriot-Watt University – Shoogleit – which enables users to digitally rotate images as well as pinch and scrunch fabric swatches on touchscreen devices. The aim is to understand whether the development of new digital technologies and computer interfaces may decrease the perceptual gap between digital and physical product evaluation and overcome the lack of tactile input which currently characterises online fashion shopping.

Keywords: Human Computer Interaction, experimental, e-commerce, fashion, website design, IIT, touch

Introduction

Although fashion is a high growth category in e-commerce, it is characterised by a return rate of around 25% (Retail Week, 2012), a low conversion rate from visits to retailers' websites (Chaffey, 2013; Kukar-Kinney and Close, 2010) and a high percentage of shopping cart abandonment (Kukar-Kinney and Close, 2010). Fashion consumer behaviour is a multi-sensory experience involving a number of senses which enables consumers to gain information for evaluating products, with haptic perception referring to the gathering of information about a product through the sense of touch (Workman, 2010). However, the inability to touch products during the purchase decision-making process is a shortcoming of fashion e-commerce (Citrin et al, 2003) and is one of the big challenges for fashion retailers. For fashion, intangibility is the principle determinant of risk in online purchase (Yu et al, 2012) rather than security, privacy and system security concerns (Eggert, 2006). This lack of sensory input prevents consumers from being able to make an informed purchase decision (Yu et al, 2012; Merle et al, 2012; Eggert, 2006)

Presenting an object using single static images allows users to get a good understanding of the object's essence; however, since consumers acquire most information about products through vision and touch (Schifferstein and Cleiren, 2005), then the lack of touch and feel which characterises online shopping may lead to increased perception of risk. Certain characteristics of objects are difficult to convey from the physical to the digital domain, for example:

- Flow (weight, thickness, drape)
- Movement (stretchiness, comfort)
- Motion disparity (gloss, speckle)
- Personality (charm, attitude)

McCabe and Nowlis (2003) found that in the case of products with material properties, such as clothing, consumers' preferences in online environments increase when the product features are described in terms of their touch properties more than their visual properties.

The development of various forms of image interactivity technology (IIT) makes online fashion shopping more accessible and tangible to consumers (Yu et al, 2012). The theoretical underpinning for the study of IIT lies within the broader domain of atmospherics. This refers to the application of environmental psychology to marketing and can be defined as "the conscious designing of space to create certain effects in buyers" (Kotler, 1972, p.50). Just as the physical environment influences various psychological and behavioural shopping outcomes in a bricks and mortar store (Donovan and Rossiter, 1982; Bitner, 1992), certain

atmospheric qualities of retailer websites are likely to affect the use (intentions and actual) and results (e.g. satisfaction, re-patronage, amount purchased, and dwell time) of the online store (Eroglu et al, 2001). IIT can reduce perceived product risk and increase hedonic value of the online shopping process (Kim and Forsythe, 2009). Close-up pictures, zoom facility, 2D or 3D rotation, mix-and-match function which simulates how items would look together, virtual try-on facility using personalised or non-personalised models in virtual dressing rooms, and augmented reality apps provide online shoppers with an enhanced ability to evaluate the properties of the item online in order to overcome the relative sensory impoverishment when compared to shopping in a physical store. Zoom and 3D virtual try-on reduces perceived risks and create positive attitudes toward the retailer (Lee et al, 2010). Rotation (360 degree spin) positively influences cognitive (perceived information), affective (mood), and conative (attitude and behavioural intention) outcomes (Park et al, 2008). Mix and match technology resulted in greater purchase intentions, revisit intentions, time spent on website and attitude towards website (Fiore and Jin, 2003). Personalised 3D virtual try-on positively influences utilitarian value and purchase intention (Merle et al, 2012). Interactivity increases consumers' perceived hedonic value (Yoo et al, 2010). Presence of aspects of IIT on e-tail websites therefore leads to positive consumer responses such as purchase intention, revisit intention, duration of time spent on website and overall perception of the website (Merle et al, 2012; Lee et al, 2010; Park et al, 2008; Kim and Forsythe, 2008; Kim et al, 2007; Fiore and Jin, 2003; Schlosser, 2003). Furthermore, virtual product experiences, 2-D and 3-D virtual product experiences that provide visual, tactile, functional, and/or behavioural simulations of product attributes during product inspection, helped consumers perceive less product performance risk (Li et al, 2002; Park et al, 2005).

Development of a digital tool

Animation and video enables retailers to further engage with e-shoppers by providing enhanced product evaluation possibilities beyond those possible from a static 2D image. However, these tend to be difficult and costly to produce and therefore out of reach for smaller retailers or individuals with limited resources. Furthermore, videos of animations may be difficult to stop, rewind or zoom.

With EPSRC Digital Economy funding, Shoogleit was developed in order to produce user-controlled interactive object visualisations which could digitally communicate sensationand which would be more engaging than static images, but easier and cheaper to produce than a high quality video. Furthermore, as web users become anxious when unable to actively control interactive elements (Nielsen and Pernice, 2009), user-controlled interactivity was incorporated in order to increase cognitive and affective responses (Park et al, 2008). Interactivity controlled by users allows for a synesthetic response between the subject and the media (Jacob et al, 2008). The name Shoogleit comes from the Scots dialect verb 'to shoogle', meaning to shake, sway or rock back and forth. Specific criteria were followed for the development of an easy-to-use digital tool that could be used by professionals and the general public:

 Make it as simple as possible: A simple interface was created that mimics a film strip, where users can add, cut or reorganise frames.

 Run in all computers: Shoogleit runs using Adobe's Flash Player as it is present on most computers (96% compared to around 60% of HTML5 enabled browsers).

 Viewable on all devices: Accomplished by separating the data from the Shoogle player. Shoogles run on all Flash enabled devices including mobiles (Android 2.2) and on all iOS devices (http://www.shoogleit.com/app).

 Able to find, share and embed: Shoogles(i.e. the outputs of the tool) are indexed daily by search engines. Anyone can share and embed them on their Facebook, Twitter, website, blog or on eBay.

 Quick to download: We added various optimisations to our data including inter-frame and data compressions. Currently, Shoogles are 64% smaller in size compared to small video (480p), 24% smaller than normal size videos (720p) and about the same size as high definition videos (1080p), which is the default YouTube quality of a recording of a 30 second rotation.

The process for creating a Shoogle is shown in Figure 1 below. A short video (or sequence of images) of an object in motion is recorded. This is uploaded to the Shoogleit servers where users can split the video into frames. Then users fix the frames and add interactivity using the tool. Finally, they publish the Shoogle on the cloud servers or embed it into their own website.

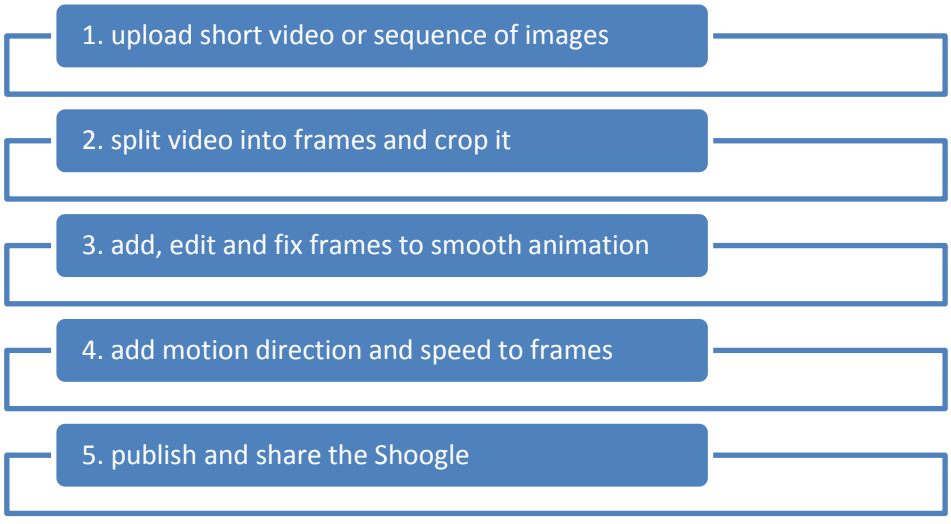

Figure 1: Process for creating Shoogles (Padilla and Chantler, 2011)

Figure 2 below shows the Shoogleit cloud interface where users can create and upload their own Shoogles. The use of the tool is free, but there is a small charge to pay if users wish to use it unbranded.

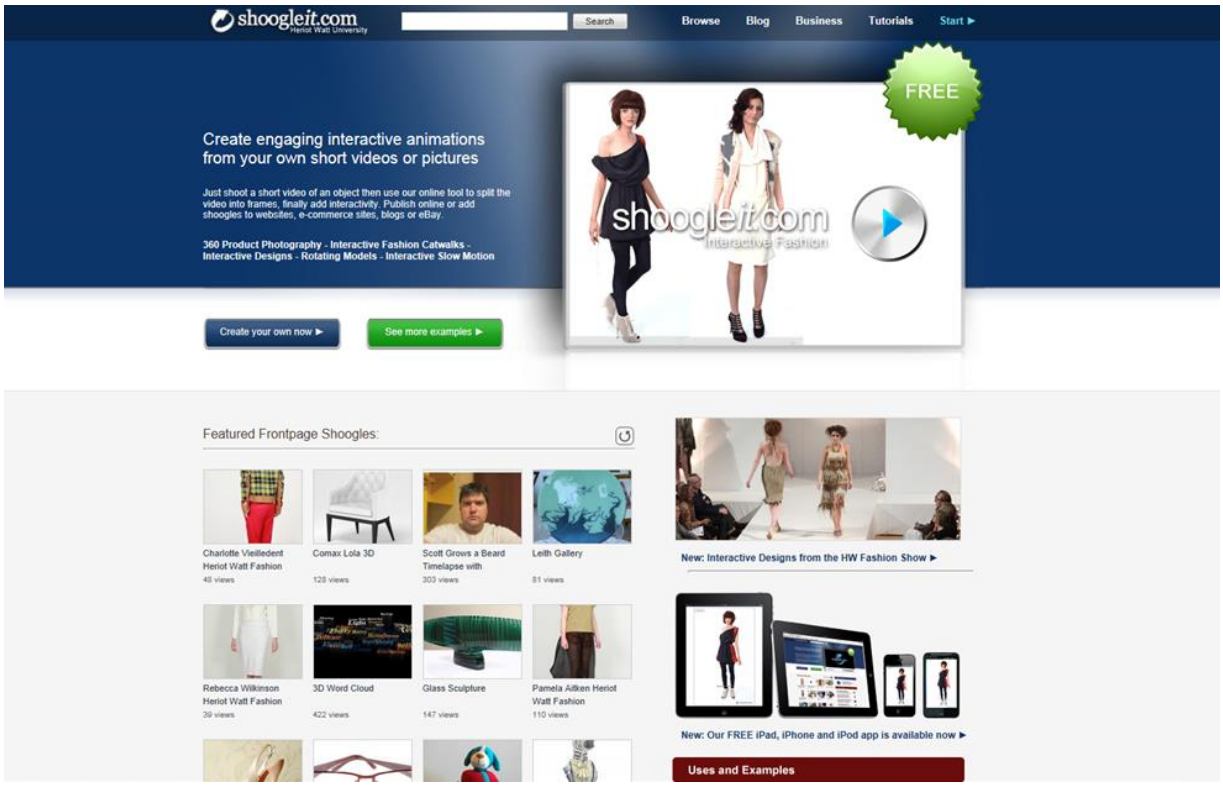

Figure 2: Shoogleit cloud interface (www.shoogleit.com)

Figures 3 and 4 below show examples of Shoogles for evaluating the properties of garments (rotation) and fabrics (scrunch) online.

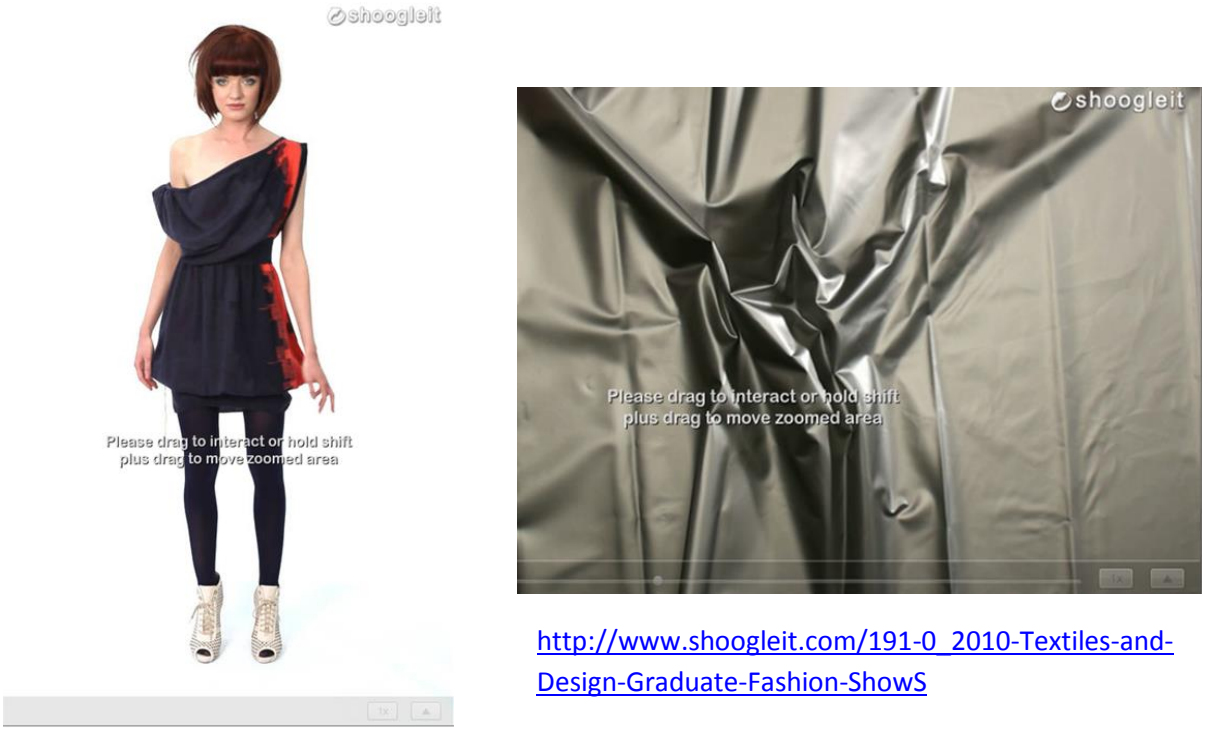

Figure 3: Shoogleit rotate and scrunch

http://www.shoogleit.com/191-0_2010-Textiles-and-Design-Graduate-Fashion-ShowS

http://www.shoogleit.com/121-0_Metallic-Cloth-With-Drag-Animation

Extant research on IIT for fashion is limited to the desktop experience. However, given recent technological advances in computer interfaces and increasing levels of smartphone and tablet penetration, the growth of m-commerce and the integration of web-based technologies on touchscreens within retailers' physical stores, there is justification in progressing the study of IIT from desktops to touchscreen devices. Touchscreen mobile devices are predicted to overtake the desktop web for e-commerce sales within the next few years (Amplience, 2012). Clothing and footwear are two of the most popular categories for mobile shopping. For example, 30% of the sales of online luxury fashion retailer Net-a-Porter come from mobile devices (Kansara, 2013). Furthermore, industry evidence suggests that fashion works especially well on tablets (Retail Week, 2012). Smartphones and tablets devices permit greater interactivity between consumers and websites due to their touchscreen technology and multi-modal (vision, touch, sound, vibration) capabilities. Hence, Ono et al (2012) noted the potential distinction in consumer motivations between browsing in mobile-based online stores as opposed to computer-based online stores. Touchscreen devices allow users to directly manipulate objects on the screen so the retail browsing experience becomes richer and more intuitive than on a desktop. New multi-touch user interfaces allowing users to interact using single- and multi-finger gestures such as pointing, tapping, flicking, rotating and pinching (Padilla et al, 2012; Orzechowski et al, 2012; Kane et al, 2008; Wu and Balakrishnan, 2003).

Adapting the Shoogleit tool for use on touchscreen interfaces which use well-known real-life gestures such as stroking, pinching, crunching goes some way to reducing the perceptual gap when digitally evaluating objects compared to physical evaluation. An app was created which

merges user gestures on touchscreen devices with animations matching the gesture in a real object. Figure 4 below shows the Shoogleit mobile portfolio app for use on mobiles and tablets.

Figure 4: Shoogleit mobile portfolio app

Figure 5 below shows the user digitally scrunching fabric on a touchscreen device, using the same well-known real life gestures as would be used in a physical store to evaluate and engage with the object in a more natural and authentic way than is possible with a keyboard and mouse (Orzechowski et al, 2012).

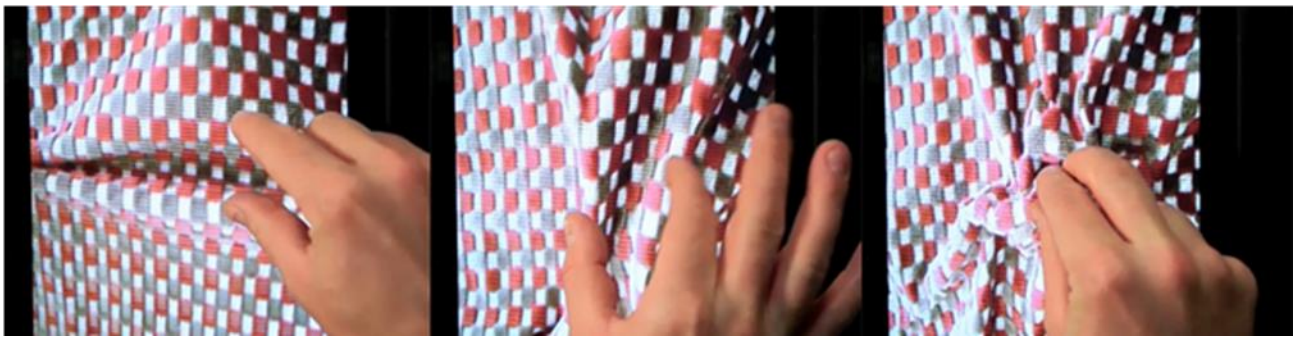

Figure 5: Shoogleit multi-gesture interface on touchscreen device

In order to progress the study of IIT from desktop to touchscreen devices, experimental research is planned to test the effect of gestural interactivity on fashion consumers' perceptions of risk, intangibility and engagement. Using a between-subjects experimental design (Charness et al, 2012), with fashion marketing students recruited as participants from two universities in London and Manchester, the following research question will be addressed:

> RQ: How does gestural interactivity affect consumer engagement with the online fashion shopping process?

Participants will be randomly allocated to 1 of 3 experimental groups. The control group will participate with static images of the front and back of the garments on an iPad. The first experimental group will be exposed to the Shoogleit rotate technology on an iPad, while the second experimental group will be exposed to the Shoogleit scrunch technology on an iPad.

A two-step procedure will be followed. Participants will firstly complete a short questionnaire about their experience of shopping for fashion online and their nee their perception about their own body image and their need for touch perception. Then, they will browse fashion items on the tablet and after interacting with each level of technology, they will fill in a questionnaire assessing the risk perceived in the process, the evaluation difficulty and their engagement with the experience, using the following scales:

- Perceived risk (visual, tactile and trial): Yu et al, 2012
- Intangibility: Laroche et al, 2005
- Engagement: O'Brien and Toms, 2010.

Further research

An application was made for ESRC funding under the Knowledge Exchange Opportunities 2013 call, with an award for 'The application of gestural interactivity technology to online fashion retailing' (£300k) pending. The purpose of the 12 month project is to test and refine the Shoogleit technology in a number of SME fashion retail partners for use both online and in-store, as a precursor to potential mass adoption. Although Shoogleit technology has been successful developed, the industry reality of how it can deliver value to the retailer and the consumer remains unknown. Therefore, the project will answer the following research questions:

RQ1: To explore the application of gestural image interactivity technology (IIT) on touchscreen devices in the online fashion retail context, as a means of

a. addressing the perceptual gap between digital and physical product evaluation;
b. fulfilling consumers' utilitarian and hedonic shopping motives;
c. addressing online product returns and basket abandonment rates.

RQ2: To understand the barriers and facilitators of gestural IIT adoption by online fashion retailers, with a focus on small to medium sized enterprises (SMEs).

To answer these questions, a combination of qualitative and quantitative data will be collected through consumer focus groups, industry informant interviews and transactional website data from partner companies.

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