

Danielle Wilde · Sophie Birkmayer

## Dress and Ange: coercing the address of highly personal body-centric issues

Received: 15 February 2004 / Accepted: 9 April 2004 / Published online: 25 June 2004  
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**Abstract** This paper compares two interactive interfaces, Dress and Ange, designed to facilitate an experiential address of the user or viewer's relationship to touch. Dress, a polypropylene dress fitted with small "counters", which offer glimpses of human flesh for sale, is a shop that sells the possibility to touch human skin. The "sales-person" wears this "body-shop" and wanders through public domains inviting people to pull on a "pearl" of their choice and, thereby, expose a parcel of skin that they are to caress gently, momentarily with their fingertips. The second device, Ange, consists of a transparent corset with metal rib-like protuberances. Through the strategic use of flex sensors, these rib-keys act as points of actuation and volume control levers for corresponding sound samples. Ange has been designed to be exhibited, performed or worn in the public domain in a similar way to Dress. The inspiration and consequent design of both Dress and Ange will be discussed and compared, as will their public exhibition and performance in order to demonstrate the effectiveness of these design solutions. In conclusion, the value of particular design strategies to coerce or seduce a viewer to address highly personal issues, will be raised.

**Keywords** Wearable · Interactive interface · Touch · Intimacy in the public domain · Humour · Seduction through design · Mechanical vs. digital · Flex sensors

### 1 Dress

#### 1.1 Introduction

Dress was created for a Royal College of Art School of Architecture and Design project brief entitled, "Body as a Shop" (Fig. 1). The project, presented by Tony Dunne, Durrell Bishop and Freddie Robbins [1], ran over a four-week period in April 2002.

The aim with Dress was to explore the fundamental human need for touch. In contemporary Western society, touch has been transformed from a simple contact-making gesture to an act loaded with, often uncomfortable, connotations. Dress provides a safe context within which to practice and refamiliarise oneself with touch—a context in which the user, viewer or consumer need have no fear of their actions being misunderstood or misconstrued.

The resulting "store" allows us to challenge the "customer's" relationship to touch by having them confront their personal and cultural inhibitions to touching another person in public. Exposing naked flesh to the touch of a paying "customer" also brings attention to the conflation of erotic and consumerist values so prevalent in our culture.

#### 1.2 Viewing context

Dress was designed specifically to be presented at Salone Satellite—the young designers' salon, at Salone Internazionale di Mobile, the International Furniture and Design Fair in Milan. Salone Satellite is an enormous, bustling space full of up and coming designers and an eager design public.

Dress has also been presented at an Affiliates' Day meeting for the Department of Interaction Design at the Royal College of Art in London (RCA). Affiliates' Day meetings are small formal gatherings of design professionals who come together to discuss and debate the discipline and to share examples of work (Fig. 2).

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**Fig. 1** Dress, worn by Sophie Birkmayer

### 1.3 Function and design

#### 1.3.1 Overview

Dress was created out of polypropylene, a semi-rigid plastic, and designed as an iconic abstraction of a dress. The dress and its accessories completely cover the wearer, leaving only the face exposed. When a customer

chooses and pulls on one of the “pearls” which protrude from the centre of the chest of the dress, one of ten windows or “sales-counters” opens to expose a piece of naked flesh which they are invited to touch gently, momentarily, with their fingertips (Fig. 3).

The rigidity of form and the almost total absence of visibility of skin create an “armour” which serves both to hide and to shield the wearer of Dress. This accentuates the nature of the offering—the “parcels” of naked flesh—whilst highlighting the issues of vulnerability, exposure and morality inherent in the proposed transaction.

With the exception of the “sales-counters”, the transparent plastic tubing from which the “pearls” protrude, and the associated mauve-coloured fishing line, Dress and its accessories (satin glove-sleeves, “balaclava”, hat, stockings, sandals and clutch-bag) are all white and adhere in design and form to the perceived conventions of purity, chastity and good taste. This colour scheme was chosen specifically to conform with “norms of respectability.” In addition, the woman wearing Dress bears a visual resemblance to a nurse, or nun, and this similitude is extended through the perception that she is there to help the “customer”, to “cure” them of a potential “dysfunction”, a physically manifest, culturally induced, psychological or spiritual malaise (Fig. 4).

#### 1.3.2 Materials

The materials used in Dress are all man-made. Plastics, foams, lycra and polymers stand between the wearer and physical contact. This artificial barrier protects from, and prevents, natural, unaffected, even accidental touch.

Though not a material usually considered for clothing, polypropylene offered a number of advantages. Its flexible rigidity allowed us to make an iconic abstraction of a dress complete with curves, movement and a sense that it was not uncomfortable to wear, while at the same time, projecting an impression of armour or protection. The rigidity of form also facilitated the functioning of the windows.

The decision to use polypropylene, though, raised an important technical issue: polypropylene resists most glues and solvents, and those that do take do not hold

**Fig. 2** Dress, worn by Danielle Wilde at Salone Satellite, Milan, Italy, May 2002



**Fig. 3** Demonstrating the opening function of Dress. Front and rear views of main structure



**Fig. 4** Dress worn by Sophie Birkmayer; accessories exhibited at RCA, London, July 2003



under stress. To create the curved form of Dress, it was necessary to find an alternative method of joining the material. The resulting system of tabs uses the strength of the material itself to hold it in place. In addition, viewed from the outside or exterior of the garment, this system resembles stitching, and so, is in keeping with the integrity of the form—an iconic abstraction of a dress (Fig. 5).

### 1.3.3 The “sales-counters” or windows

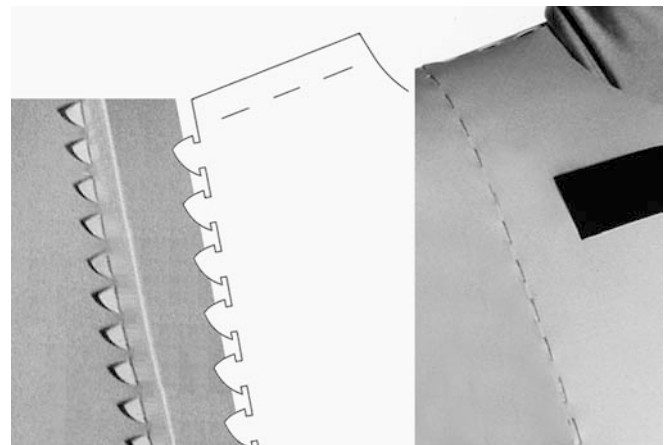
The pink “sales-counters” on the dress expose parts of the body that were noted to be pleasurable (sensual but not sexual) to the touch. This placement was determined through an informal questioning of approximately 20 randomly chosen students at the RCA.

The system for opening the windows is relatively simple. Seven artificial pearls, each at the end of a plastic tube, protrude in a cluster from the chest of the dress. Each of these “pearls” is attached to a window with nylon fishing line passed through plastic tubing. The tubing acts both as a guide and as a “stop” which prevents the “pearl” from being pulled indefinitely and the window being opened beyond where it is necessary to see through the resulting opening in the dress. The base of each of the windows is held at the bottom with elastic

to effectuate a “return to place” or “closing of the window” once the “pearl” is released (Fig. 6).

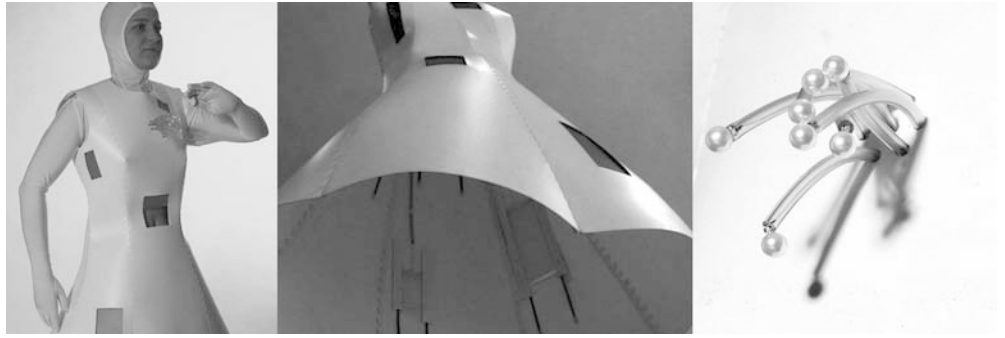
It is important to note that not all of the windows on the dress open. There are a total of ten windows—six on the front and four on the back—and only seven “pearls”. All of the front windows open, but, on the back, only the highest, the window above the right shoulder blade, opens.

The method of opening the windows places a certain amount of tension on the materials, particularly when



**Fig. 5** Dress—interior and exterior details of “stitching”

**Fig. 6** Dress—details: windows and cluster of “pearls”



the pathway that the nylon follows is curved. Technically, the windows chosen were found to be less problematic. Opening a window at the base of the rear of the dress, for example, seemed to place too much pressure on the form and the resulting deformation and resistance prevented the dress from functioning with ease.

Another consideration for the placement of the windows was the “safety” of the “sales-person”; the person inside the dress. It is important to the success of Dress that the “sales-person” feels completely comfortable and in no way threatened by the exposure of their skin to the touch of another person. Having windows open only in the front, or in an area where the dress is tight against the form of the body, preventing exposure or touch beyond the frame of the window, supports this (Fig. 7).

In addition, the choice of only seven out of the ten windows opening effectuates a kind of titillation—the desired window may not be a functioning window. Compounding this, the “pearls” protrude in a cluster so that the customer can never be certain which window is about to open, no matter how many times they make a transaction.

#### 1.4 The role of technology

The design of interactive interfaces often occurs in technologically dense environments. The Department of Interaction Design at the Royal College of Art is no exception. The natural tendency in such contexts is to avail oneself of the most elegant high-tech solutions available. In recognition of this, an underlying intention with the Dress project was to resolve any design issues that arose without resorting to technology, particularly digital technology, unless there was simply no alternative.

In Dress, the interactive elements were successfully designed using fishing line and elastic instead of more complex electronic circuitry. What this solution confirms is the idea of the primacy of concept over means of execution, i.e. the conviction that there is no reason to opt for technologically sophisticated means when a simple mechanical solution is possible.

#### 1.5 The experience of interacting with Dress

When a potential customer approaches Dress, they are handed a simple, yet elegant, invitation, which explains the purpose of the “shop” and invites them to “partake of the wares” (Fig. 8). The “sales-person” reiterates the invitation, attempting to gently encourage the “customer” to participate.

Once the transaction has been agreed, the “customer” chooses a “pearl” and pulls it to reveal their parcel of flesh. The entire undertaking is easy and humorous. The comic-like design of the dress and the stylised attitude of the “sales-person” seem to amuse and delight people, making them eager to engage.

Though the transaction has been clearly defined from the outset, it is at the moment when the “parcel” of flesh has been revealed and they are expected to touch that the “customers” seem to realise the ramifications of participating—that they will now be expected to touch a strangely isolated section of the body of another person in public. Without exception, acknowledgement of this realisation has become visible on “customers’” faces. At this point, some participants proceeded and others declined the offer, but, without exception, they all laughed before continuing in their chosen way. To date, there does not seem to be any clear patterns governing

**Fig. 7** Dress—details of “sales-counter” windows in use





**Fig. 8** Dress—offering the invitation card

this choice, though socio-cultural backgrounds do appear to have some bearing.

### 1.6 The ramifications of buying physical contact

The fee to partake of Dress in Milan was €2 per “pearl”. There seemed to be an overall reluctance to pay for the transaction, though it was not clear if this was a reflection of the abundance of “free trials” on offer at Salone or the discomfort generated by the conflation of economic and consumerist values. On reflection, it was deduced that Dress would function best as a service provided by, for example, the local council, shopping centre, organiser of an event or some such equivalent body. The service was provided free of charge at the RCA Affiliates’ Day meeting.

### 1.7 Conclusion

In conclusion, spectators seem to have found the piece provocative and alluring. People have stopped of their own accord to inquire about and interact with Dress, and have consistently offered personal accounts of their experiences regarding various cultural attitudes towards touching.

The fact that people share their stories, without being prompted or asked, would seem a clear indication that Dress stimulates reflection about our personal and cultural attitudes towards touch.

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## 2 Ange

### 2.1 Introduction

Ange is a wearable musical interface inspired by an 18th century medical engraving and women’s corsetry throughout the ages. The engraving, *Ange Anatomique* [2], by Jacques Fabien Gauthier d’Agoty, is of a woman, whose back has been flayed, exposing the musculature and bone structure and creating the suggestion of wings.

Ange incorporates this form into a wearable piece of custom-made corsetry.

Through the use of electronic sensors, which make the ribcage “playable” (i.e. enabling the player’s touch to trigger and manipulate tones), Ange allows the viewer to metaphorically touch and “play” the body of the wearer.

Individual relationships to the body can be complex, and our relationships to intimate touch complicated further by cultural contradictions and taboos. Though it is rare for people to express themselves freely in public in an intimate context, self-consciousness often disappears as we initiate and play a series of vibrations in, through and with the body of a partner.

The goal of the Ange project was to create a fully functioning garment/instrument, which invites reflection on this idea of “playing” someone’s body (Fig. 9).

### 2.2 Viewing context

Ange was created during the three-month period from April 2003 through June 2003 and exhibited and performed in The Royal College of Art Graduate Exhibition, *The Show: Two*, in London in July of the same year.

Ange was designed to be performed “solo” by the wearer, or in a theatrical context with additional performers. Ange can also be worn in public domains, the wearer wandering through crowds encouraging people to touch and play her, in a similar fashion to the “performance” of Dress (Fig. 10).

In *The Show: Two*, Ange was also exhibited in a more traditional exhibition format—mounted on a tailor-made stand, the rib-keys within comfortable reach of the viewer. In this context, viewers are free to play and explore the interactive possibilities of the instrument without having to navigate the personal or spatial politics that are present when Ange is being worn. When exhibited in this way, Ange was accompanied by a video of the interface being played in performance.

### 2.3 Inspiration

Philippe Comar, in his book *Les Images du Corps* [3], or *Images of the Body*, annotates an image of Gauthier d’Agoty’s engraving thus:

Partially detached from their insertion points, the dorsal muscles unfold-like wings, giving the figure the aspect of an “anatomical angel.”

Jacques Gauthier d’Agoty, speaking of his 1746 engraving, says:

For the dissection of unfolded muscles in this engraving we used the cadaver of a woman as the muscles are more delicate and take up less space. This allowed us to give greater expanse to the form. We left the head on for pleasure [4].

The engraving is full of contradictions—it is a dissected body, and yet, the gentle turning of the woman’s head, her soft curls and pale blue hair-band seem to give her an

Fig. 9 Ange

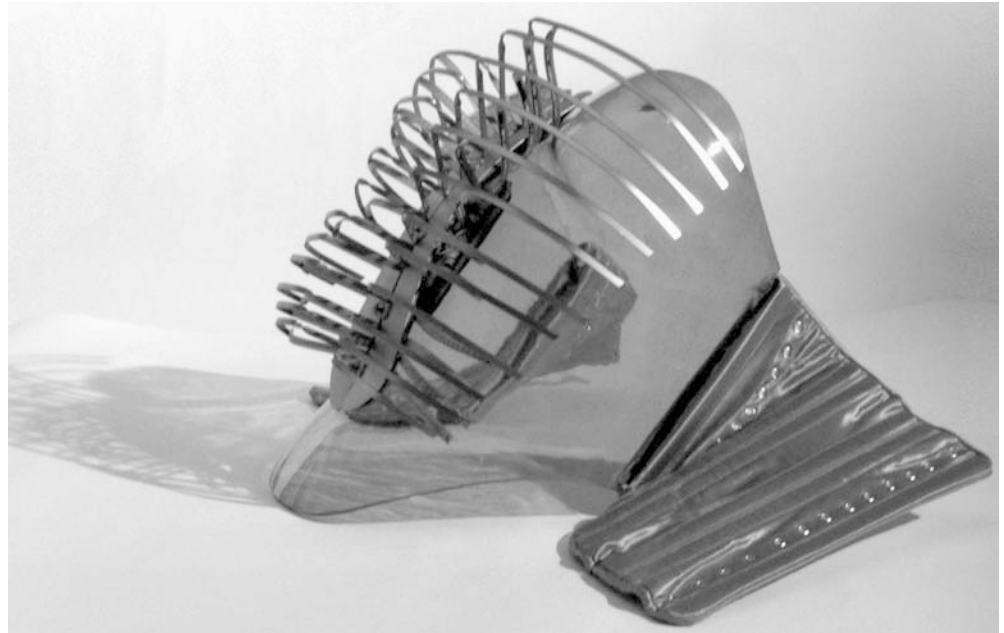


Fig. 10 Ange in exhibition and performance, RCA, London, July 2003



almost demure look; and the peeling back of the skin resembles the lace edging on fine lingerie. The neckline seems to follow the same line as a bodice worn in the royal courts of Louis XIV, and the line of dissection on the haunches echoes delicate lace edging on a corset (Fig. 11).

The colours of the engraving are deep and rich. Though based on an actual dissected cadaver, the anatomy seems somewhat abstracted—it is difficult to reconcile the image with what we know of our skeletal form today. The backbone seems to be missing, the form distended—making it simultaneously easier and more difficult to view (Fig. 12).

## 2.4 Function and design

### 2.4.1 Overview

Ange consists of a bodice, the rear of which is highly boned fabric and lacing, the front of which is dyed,

vacuum-formed transparent polymer with a series of metal rib-like protuberances. Ange has been designed to trigger contradictory impulses in the viewer, and so, echo the contradictions inherent in its inspiration and conceptual concerns. An abstraction of the anatomically distended form of a dissected woman's back has been mounted into the front of a highly structured, luxurious, "flesh-pink" bodice; the resulting form reading like an externalisation of the wearer's own ribcage. The electronic circuitry, which enables the functionality of Ange, is exposed and clearly visible through this "ribcage", as is the naked torso of the wearer through the solid polymer bodice of the garment. This externalisation and reversal of the inner workings and anatomical structure allows the wearer of Ange to be viewed and experienced as completely exposed, and yet, the solidity of the polymer bodice protects both the wearer and the "player" from actual physical contact.



**Fig. 11** Ange Anatomique. Medical engraving by Jacques Fabien Gauthier d'Agoty, 1847

#### 2.4.2 Structure and materials

Corsets abound in contradictions. By structurally altering the arrangement of the internal organs, a woman is able to enhance the line of her form and, supposedly, become more beautiful, more desirable and anatomically “more correct” than nature and her environment has made her. In seeming contradiction, the choice to cast, mould and vacuum form the designer’s torso facilitated the creation of a “modern” corset which supports the

natural placement of the body’s internal components, without shifting the perceptions that normally accompany the wearing of corsetry.

The rear and sides of Ange and the accompanying skirt and draping are constructed of luxurious natural fibres—satins, silks and velours in rich flesh tones, pinks, reds, browns and burgundies—seductive to the eye and beautiful to the touch. The desire was to create a voluptuous and highly sensual outfit to support and surround the interactive interface.

## 2.5 Technical

### 2.5.1 System architecture

The functionality of Ange is simultaneously simple and transparent. The embedded electronic circuitry consists of 24 flex sensors, one for each rib, a series of multiplexes and a BS2 Basic Stamp which transforms the resistances recorded through the flex sensors into MIDI signals. The garment is then connected through a USB-MIDI interface to an Apple Macintosh CPU, which contains an application created in Max. Thus, each time one (or more) of the ribs are pressed, an associated sound sample, stored in the computer, is triggered and manipulated accordingly. The amount of pressure on each rib, as measured by the flex sensor, determines the volume of the appropriate tone or sound. So, the player of the interface is able to affect the nature of their composition by mixing soft and loud sounds together or in series as they “play” the body of the woman wearing Ange (Fig. 13).

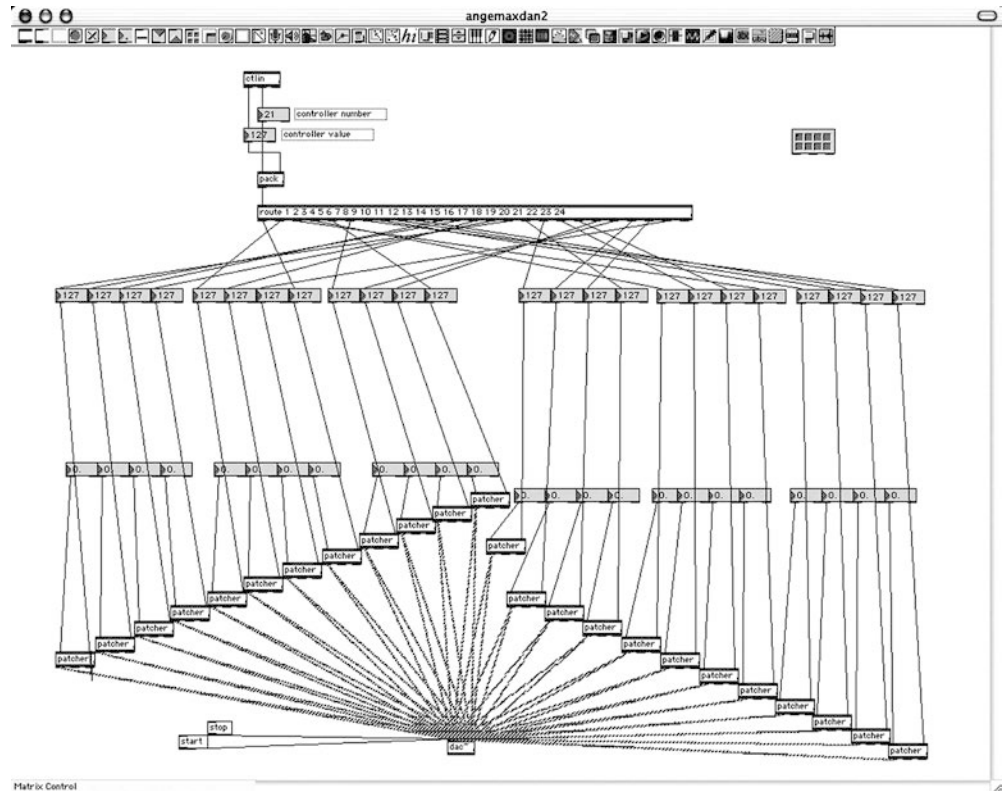
### 2.5.2 Sound design

The sounds linked to the keys are grouped to enable rapid intuitive use. The top four rib-keys on each side, close to the breasts, trigger sounds based on breath or voice; the middle four trigger abstract sounds related to touch—scratching and tickling sounds; and the lower four rib-keys on each side trigger drums, gongs, chimes and orchestral oboe mixes.

**Fig. 12** Ange video stills. Interface worn by Danielle Wilde, played by Tara Creme



Fig. 13 Ange Max patch



This mix of sounds allows a wide range of soundscapes to be created by the person playing Ange. Mixing different breathing tracks together or ambient oboe with a giggle or using the drumbeats to alter rhythm and pace allow a breadth of expression; thus, Ange can be used by each individual “player” to reflect their personal response to their experience.

Of the “vocal” sound samples, two are less abstracted than the others. The first contains whispered pleas responding to touch, such as “please stop” and “no”, while the second contains looped overlaid phrases from an E.E. Cummings’ poem entitled, “somewhere i have never travelled, gladly beyond” [5]. The entire poem is as follows:

somewhere i have never travelled, gladly beyond  
any experience, your eyes have their silence:  
in your most frail gesture are things which enclose me,  
or which i cannot touch because they are too near  
  
your slightest look will easily unclose me  
though i have closed myself as fingers,  
you open always petal by petal myself as Spring opens  
(touching skilfully, mysteriously) her first rose  
  
or if your wish be to close me, i and  
my life will shut very beautifully, suddenly,  
as when the heart of this flower imagines  
the snow carefully everywhere descending;  
nothing which we are to perceive in this world equals  
the power of your intense fragility: whose texture  
compels me with the color of its countries,  
rendering death and forever with each breathing

(i do not know what it is about you that closes  
and opens; only something in me understands  
the voice of your eyes is deeper than all roses)  
nobody, not even the rain, has such small hands

### 2.6 The experience of interacting with Ange

The materials used in Ange—natural fibres, plastics and metals—each have their own particular tactile quality. When fully dressed, the wearer of Ange is shrouded in a sea of reds, roses, burgundies and metallic reflections. They emanate sensuality, flesh, nakedness or exposure, enclosure, vulnerability and inaccessibility. Ange simultaneously repels and incites the viewer to physical contact, with the intention of challenging or, at the least enticing, them to explore their relationships to intimate touch.

When Ange was performed in a relatively intimate situation amongst student and faculty from the Department of Interaction Design, people seemed intrigued but highly reluctant to actually touch the interface, let alone to play it. Though responses were enthusiastic, the experience of interacting seemed far too confronting for people to move beyond initial contact to exploring the possibilities of the interface in any compositional sense.

When performed for the general public in the context of the Royal College of Art’s graduate show, people crowded around to view the performance. For reasons of visibility and performer comfort, Ange was performed on a large pedestal or stage, thus, limiting



viewer interaction. Afterwards, though, people were given the possibility of approaching. The most successful of these interactions seemed to be an architect, who was known to the designer, who allowed himself to explore, at least somewhat, the compositional qualities of the instrument; and an 8-year-old girl, accompanied by her mother, who was so intrigued by both the visual aspect and the interactive possibilities contained therein, that she was not at all confronted by the virtual, partial nudity of the wearer. Other people would crowd around but maintain their distance.

Many people returned for repeat performances—something which would seem to indicate a certain success, but whether the viewers were able to acknowledge or confront their relationship to intimate touch in this context is debatable.

When Ange was exhibited on a stand, available for public interaction as an interface, which, otherwise, would be worn, people seemed far more willing to experiment and explore. In this context, it was possible for people to play and engage with the conceptual concerns and ideas driving the piece without having to navigate personal, spatial or social politics. A number of people engaged in in-depth exploration of possible soundscapes that they were able to create, and numerous people returned specifically to introduce others to these possibilities.

Though the piece was well received, the success of Ange, in relation to its intentions, is not really consistent in different contexts or modes of presentation.

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### 3 Comparison of design strategies

#### 3.1 Overview

Dress is a relatively simple piece realised over a four-week period; it uses technically simple responses to design issues, and it delights and surprises the viewer. Ange, in contrast to this, took three months to realise, uses relatively sophisticated technical responses to the design issues raised—such as embedded electronic circuitry, sensor application and personalised software—and, though it intrigues and seduces the viewer, it also confronts them to varying degrees.

In both of these instances, the design choices seem to be appropriate for their respective conceptual concerns, though, for reasons I will discuss herein, Dress could be argued to be a more successful attempt to coerce the viewer to address highly personal body-centric issues in an experiential way.

#### 3.2 Ambiguity and humour

When people approached the wearer of Dress, their faces would transform the moment they were about to touch the exposed parcel of flesh, not before. In a moment, it would be possible to see an awareness of their personal relationship to the intimate space that

they were about to enter. The transaction was completely controlled and safe, and there was never any implied threat or transgression of socially acceptable limits in the transaction (though it could easily be described as being an extremely cheeky, albeit, acceptable transgression of normally existing limits).

There seems to be a level of ambiguity in Dress, which supports an experiential transaction, though the nature of what will transpire is clearly spelled out for the “customer” in advance. The heightened, almost comic-book, style of Dress and the inherent humour in the transaction somehow allows people to let down their usual barriers, only to realise what they are doing at the moment they are about to transgress their accepted behavioural limits.

Ange, on the other hand, never, at any point, pretends to be anything other than the intimate transaction, which it both is and is not. Though it is very clear that, never, at any time, will it be possible to engage in intimate touch with the wearer of Ange, the viewer’s fingers come within millimetres of the nipples and naked flesh of the wearer. In fact, it is not possible to interact with the interface without doing so, except when it is exhibited on a stand.

Though Ange is also highly stylised, it is not a humorous or “delightful” interface. It seems to reflect too closely interconnected images of Japanese Geisha, of contemporary bondage and discipline outfits and highly stylised, “operatic” images of sexual deviancy. Its inherent drama seems to prompt the viewer to raise their barriers and protect themselves, metaphorically, before they even approach the wearer of Ange—i.e. before they can be confronted in any experiential way with their private or personal relationships to intimate touch.

It also must be considered that the underlying idea of exploring intimate touch in the public domain is, perhaps, in itself, too confronting for such an interface to be able to function on an experiential level.

It is clear that Ange triggers an intellectual discussion of the issues concerned, but if the intention is to coerce the viewer into an experiential exploration, then Dress is, quite clearly, more successful.

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### 4 Conclusion

In conclusion, highly stylised design can generate both experiential and intellectual address of intimate and highly personal issues. The inclusion of humour, and perhaps, more importantly, an underlying ambiguity, as an inherent part of any transaction seems to facilitate a deeper exploration of these concerns on an experiential level before the user or viewer can put up their habitual protective barriers. If an interactive experience can first surprise or delight the user or viewer; can intrigue them and pique their curiosity; then they would, it seems, be able to enter further into a personal, uncensored, experiential (rather than purely intellectual) address of the issues concerned.

**Acknowledgements** Both Dress and Ange were created at The Royal College of Art in London as part of an MA in Interaction Design. Special Thanks to Tony Dunne, Freddie Robbins and Durrell Bishop for their reflection, support and feedback during development of Dress; and Evangelos Kaistamos, Fred Jean and Carmel McElroy for the loan of equipment. Ange Sound Design realised by Tara Creme. Electronics designed with the support, guidance and assistance of Dr. Jon Rogers and Murat Konar. Special thanks to Naoko Akiyama for her support and assistance with body casting and moulding, draping and sewing. Thanks to Murat Konar, Dominic Robson and Georg Tremmel for Max programming. Thanks also to all the technicians in the RCA Department of Architecture and Design Workshop, Jewellery Design Workshops, Vehicle Design Modelling Workshop, Textiles Dying Rooms, Department of Ceramics and Glass Workshops and the Department of Sculpture.

Department Platform, with Durrell Bishop. Durrell Bishop works at IDEO London. He currently tutors in the RCA Department of Interaction Design, though, at the time of the project, was running a Product Design Platform with Tony Dunne. Freddie Robbins, independent artist and designer, tutors in the Fashion Department at the RCA

2. "Ange Anatomique" translates literally as Anatomical Angel. The engraving dates from 1746, and is part of a series of full-colour engravings based on anatomical dissections made by French Artist Jacques Fabien Gauthier d'Agoty
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