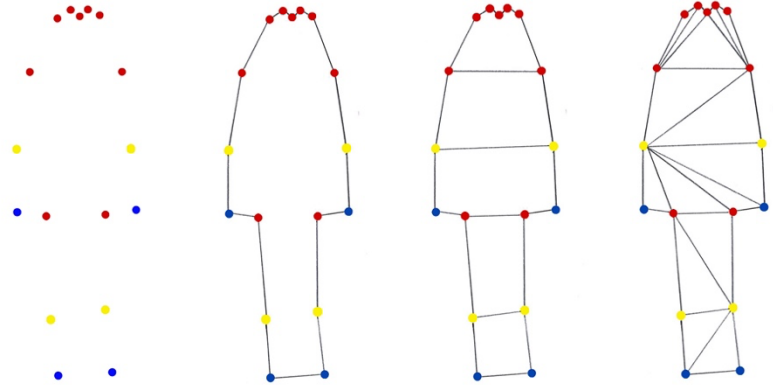


Body as moving structure in Fashion Design processes



Abstract

The human body movement is idiosyncratic and always challenging to document. This research explores ephemeral body movements and their documentation through the body-machine interface. The aim is to explore the body's aesthetics and find possibilities of the use of the body as a moving structure in fashion design processes. These ephemeral body movements are documented through an installation setup consisting of a computer, posenet (the machine learning model), camera both video and computer screen. This reflects on how the machine interface translates the body and its movement through embodied interaction. The human body is translated into seventeen dots forming new bodily expressions based on the spatial level and structural characteristics of it while moving. The installation setup serves as a method in general or in fashion design processes to create alternative design expressions.

Keywords: Design methodology, embodied interaction, kinesthetics, fashion design processes

1 Introduction

The human body has a significant role in the design process. With the developments in HCI (human-computer interaction), the available technology recognizes and documents the aesthetic experience of bodily gestures and movements [1]. With the advancement in technology, many commercial examples are available when it comes to exploring gestures and movements in the form of prototypes [2]. Human embodiment reinforces the perspective of our interaction through our bodies in the world to interactive technology design [3]. Despite there has been a focus on the lived body it still lacks attention referring to the role of movement and cognition in the

the world especially when it comes to our experience of it [4]. The existing research and studies of the lived body and exploration of movement in phenomenology suggest theoretical tools for the researchers exploring HCI [5]. 'To move one's body is to aim at things through it' this claim by Merleau-Ponty suggests the moving body in acts of perception of the external world [6]. The significance of the Kinesthetic is fundamental especially when it comes to the awareness concerning self-perception [7]. These thoughts have been implemented actively in the interaction design research referring to movement-based interaction design [8]. However, there is still a need to explore more when it comes to documenting the aesthetic experience of moving the body and the use of HCI in

fashion design processes.

This paper presents an exploration of human body movements and their translation into the digital forming new bodily expressions through a body-machine interface. This is done by using a machine learning model posenet as a sketching tool in an installation setup. The experimental explorations are informed by the EDI (Embodied Design Ideation) framework proposed by Wilde et al (2017) to develop body machine interface as a method by applying the four-step structure of the selected EDI (Embodied Design Ideation) framework: Disruption, destabilization, emergence, embodiment [9]. This research contributes to both fashion design education and HCI by exploring the use of embodied interaction in fashion design processes.

2 Related Studies

The existing research by design scholars elicits that the bodily experience is fundamental when designing aesthetic experiences based on technology [10]. The research in fashion is still developing when it comes to exploring the potential of a human-machine interface for alternative expressions in design processes. Few researchers have started to investigate the artistic possibilities of digital technologies for fashion design. In recent years there has been a conscious effort from the researchers end to consider consequences of HCI when it comes to ‘fashioning interaction’ [11]. The disruptive potential of designers working with digital technologies by Douglas Atkinson has been articulated in a fashion context [12]. The body garment relations by using a 3D body scanner by Kat Theil to merge the digital material explores possibilities of the body garment into one material [13]. With the emergence of new technologies and their possibilities in the field of fashion, there is a discourse on the research level. However, the exploration of body machine interface in fashion education is still under development.

3 Methodology

Time: 1 min for each exploration
 Exploration categories: 4

Tools: To investigate human body movement and machine interface, installation setup consisting of a computer, posenet (the machine learning model), camera both video and computer screen were used. Posenet offers four output options, however, in this research the following explorations are based on setting the output on show points.

Method: These explorations were based on a method of quick prototyping and bodystorming giving a first-hand experience for the ideation process to enhance design ideas.

Distance between the human body and machine interface was 14 feet. The documentation of the explorations was further viewed and reflected on. Following types of body, movement categories were documented by using posenet as a sketching tool and computer screen camera to record the body machine interaction outcome.

Table 1: Body movement categories

Exploration	Body movement category
E1	Walking towards setup
E2	Bending
E3	Jumping
E4	Circular movement

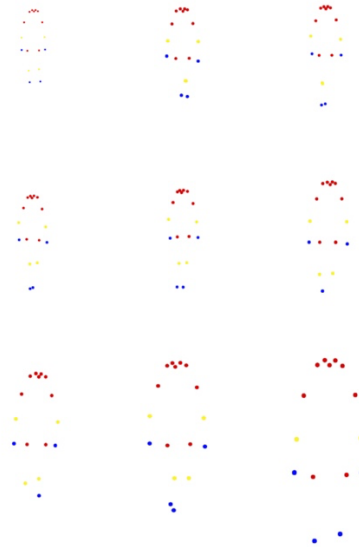


Figure 1: E1, Walking towards setup

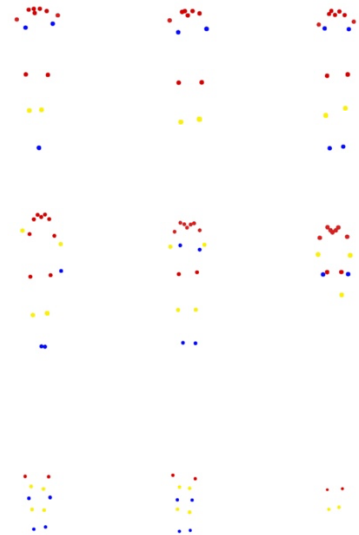


Figure 2: E2, Bending

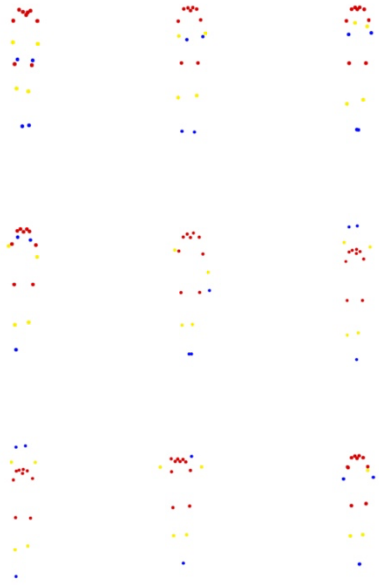


Figure 3: E3, Jumping

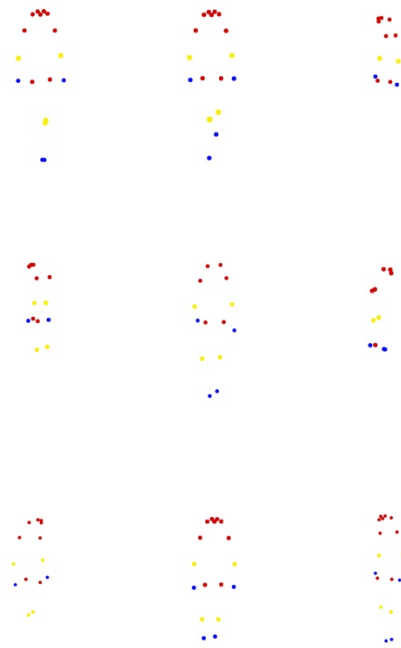


Figure 4: E4, Circular motion

4 Findings

The aforementioned explorations mainly focused on the aesthetics of the body in movement. During the explorations, the interaction of the body with the machine interface identified the following: How and where movement occurred. The human body was translated into seventeen small dots forming a dotted moving structure

using posenet as a sketching tool. The dots involved the three spatial levels of the human body see figure (5), core (torso, shoulder, hips in color red), mid-limb (elbows, and knees in color yellow), and distal (feet and hand in color blue). These dots were formed based on the spatial and structural characteristics of the human body while moving. This further highlighted how the machine interface translated the body through embodied interaction. The explorations outcome and documentation were further observed in detail suggesting the following emerging concepts.



Figure 5: core (torso, shoulder, hips in color red), mid-limb (elbows and knees in color yellow), and distal (feet and hand in color blue).

5 Results

The aforementioned explorations led to the following concepts.

Table 2: Emerging concepts

Body as dots
Body as 2-D shape
Body as 3-D shape
Body as irregular geometrical shape

6 Discussion

The experimental exploration documented ephemeral body movements and gave the insight to view alternative bodily expressions translated by the machine learning model posenet. Nine visuals were extracted from each explorative category showing the body movement in the dotted moving structure See figure 1- 4. This gave direction not only to view the human body as dots visually but also emerged concepts i.e., body as 2-D, body as 3-D, and body as irregular geometrical shapes while viewing the visuals see table (2). The dots were joined together making a line followed by the top-left dot in the core towards the right that culminated into viewing and developing the body silhouette into an irregular shape, see figure (6) from category E1 see table 1, Walking towards setup. The dots within the silhouette were joined horizontally that divided the existing shape into five further shapes. Within the existing shapes, the dots were further joined together splitting the overall silhouette into 15 shapes.

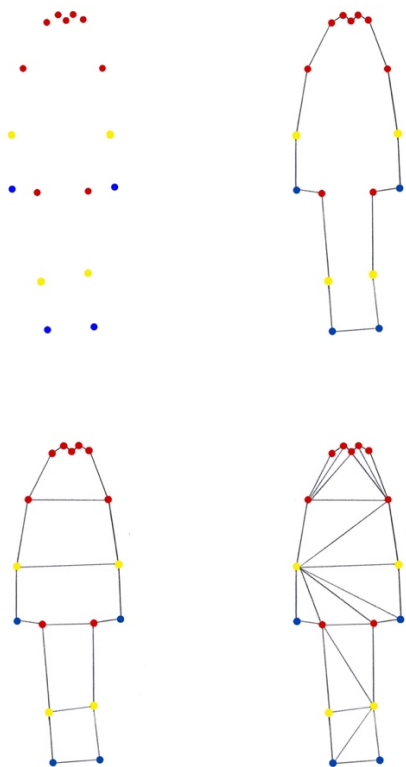


Figure 6: Joining the dots to further view the silhouette in shapes

The experimental exploration was informed by EDI (embodied design ideation framework). The machine interface brought disruption in the preconceived notion of the human body, destabilizing the existing visual expression with the emergence of alternative bodily expressions. Thus, embodying new insight into bodily expressions. The observations and analysis of the documented explorations through the body movement categories suggested that the installation setup served as a method to propose alternative body expressions in fashion design processes. All four categories depict those new bodily expressions formed are irregular and geometrical shapes.

7 Closing remarks

The current presented research has the potential to further explore the existing output of the machine learning model. Currently, only one exploration has been shared that provides alternative body expressions that can be used as a starting point in fashion design education. This research can be further developed to provide a method that can cater to the fashion industry.

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