

Perfume

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Abstract

This article provides an insight into my final-year project, *Perfume*, created as part of the Costume with Textiles course at the University of Huddersfield, comprising the design and construction of a costume for a theatre adaptation of Patrick Süskind's novel *Perfume: The Story of a Murderer*.

Initially, the analysis of the underlying literature, i.e. the script and its key themes, including the motives of identity and scent, built the foundation for the project *Perfume*. Additional literature research into cultural, historical and artistic influences, as well as practical experiments, influenced the design, textile and making process of a costume that uniquely unites both eighteenth-century period construction and interactive technology.

Ultimately, the costume construction reaches completion in its final disintegration. This article explores this alleged contradiction and, as a result, the modifications necessary to make my project work in a practical theatre context.

Despite these conflicts, the project succeeds in combining traditional and new craftsmanship, bridging the fields of costume, art and technology in an innovative way.

Keywords

Identity, costume, scent, sensory perception, disintegration, transience, smart clothing

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Introduction

The word costume can apply to many things depending on the context in which it is used. Common definitions perceive a costume as a theatrical garment, or a set of traditional clothing. Yet, when consulting a dictionary, the term costume is widely defined as:

1. a style of dress, [...] peculiar to a nation, region, group, or historical period.
2. dress or garb characteristic of another period, place, person, etc., as worn on the stage or at balls.
3. fashion of dress appropriate to a particular occasion or season.

(Harper, 2010)

Arguably, the most intriguing part of this definition is that a costume reflects the identity of a nation, a period, or a person. The concept of identity describes an individual's relationship to and perception of themselves (Olson, 2017). This conceptualisation of oneself is influenced by a person's origin and as such by the culture's understanding of materials, colours and shapes. Because of this, clothing does not only serve a practical or decorative purpose, but can evoke a sense of belonging – or of dissociation.

This characteristic is commonly utilised in a performance context, as costumes do not only function as garments but are used to support the message of the story line. In fact, a well-designed and executed costume concept has the ability to bring a whole new depth to a performance by relating to the underlying literature, thereby either complementing a character's identity, as set out by the script, or purposefully challenging it to evoke irritations and, as such, emotions in the audience.

In the construction of my final-year project I aimed to give an additional dimension to the visual experience of a costume. Can we feel and smell a costume, even if it is far away and

odourless? Can a costume contain the whole identity of a character and, when taken away, leave the actor without identity? Can a costume find its completion in its disintegration?

In an attempt to find answers to these questions, the article initially elaborates the methodology behind project and paper, before providing a short summary of its main inspiration, the novel *Perfume: The Story of a Murderer* by Patrick Süskind. In the course of this paper, the project is referred to as *Perfume*, whereas the background novel is always given its official title *Perfume: The Story of a Murderer*.

Following on from the summary, the context and setting, along with the artistic and technological influences, are explored as part of the literature review. This research and the following evaluation thereof built the foundation for the design process and the construction of the costume.

Finally, the article highlights the adjustments necessary to make the project work under real-life circumstances before ending with the conclusion.

Methodology

The following methodology addresses two different methodological problems. The first section covers the methods that went into my final-year costume project *Perfume*, whereas the second part elaborates the methods behind the present article.

Initially, the novel was analysed in terms of its content, characters and key themes. In combination with additional document research concerning the historical and sociological setting of the script, the gathered information set the basis for the project's thematic field which was directly reflected in its design process. In particular, the analysis of the key themes influenced the selection of appropriate research sources in the arts and industry and,

as a result, the choice of materials and processing techniques best suited to the project. The concluding evaluation of the document research determined the project's research question, including parameters to assess the validity of future data. Despite the careful selection of the literature, document research has a tendency to only apply partially to a project (Bryman, 1992), due to each project's individual setting and requirements. In order to gain more information, relating specifically to the costume project's approach to *Perfume*, semi-structured interviews were conducted with selected experts. As part of the purposive sampling, where participants are selected according to the researcher's own judgement (Dudovskiy, 2018), semi-structured interviews enable the researcher to question people directly regarding both their knowledge and perception of the research question (Bryman, 1992). This responsive approach not only allows the researcher to clarify the research question but also to discuss it freely with those being questioned, leading to an increase in information and creative ideas.

This exchange, triggering unanticipated ideas and knowledge regarding the techniques and materials, was particularly essential for facing the challenges of this project, which derived from aiming to visualise various abstract concepts in an entirely new, experimental and technical way. All of this information translated directly into the development of the project's costume design and built the foundation for its construction process.

The input gained in the course of these semi-structured interviews clarified the research deficiencies which needed to be supplemented with empirical investigations – both autonomically and in close exchange with specialists. This problem-driven research method is characterised by research through activity rather than theorisation, as both researcher and interviewee work together to identify a problem and find its solution (Bryman, 1992). Empirical investigations do not only have the benefit of being specifically tailored towards the project's unique demands, but are also particularly appropriate for practical projects, as their material, shape and construction can be experimentally explored in a prototype. This

prototype has to then be assessed against the requirements determined by the research question.

Despite the efforts to create authentic external circumstances for the prototype, simulations are subject to artificiality and as such have to be treated as limited representations of reality (Bryman, 1992). There is always the possible danger that a prototype works in simulations but not under realistic circumstances – in this project's case, the concept had to be re-assessed and the prototype modified to meet the practical requirements of the research question.

The project's findings and its development process are mapped out and reviewed in the present article. Analogous to Kolb's and Fry's 'Learning Cycle' (Stahl, 2015), the experiences gained through a project like *Perfume* are highly subjective until they are being analysed and reflected upon – which leads to an abstraction of the subject. The deductions of this process are elaborated and concluded within the framework of a project evaluation. As elaborated in the Glossary of Key Terms by the OECD (OECD, 2010), a project evaluation is a systematic and objective assessment of a project, aiming to clarify the relevance and success of the project. In order to do so, this project's research question is narrowed down to the thesis of the article which explores the novelty of visualising the abstract in costume, as well as the potential of technology therein.

Following the Toulmin method (Wright, 2012), the review is based on the correlation between thesis, evidence and warrant to build a strong conclusion. The evidence consists of the data collected through the literature review into the project's script, its setting and influences, supplemented with my own series of empirical research which are elaborated in a chronological order. However, as Mayer points out (Mayer, 2009,) the purpose of a review article is to not only analyse the underlying literature but also to synthesize it in order to

determine research gaps. The identified deficiencies support the credibility of the warrant and, as a result, the article's thesis.

The post-project review concludes the implications of the findings, including the identified deficiencies as well as the successes of the project as analysed, ultimately concluding the legitimacy of the article's claim.

Influences

The novel

Based on the novel *Perfume: The Story of a Murderer* by Patrick Süskind, the project *Perfume* challenges the boundaries of what a costume can be. Through the innovative use of interactive technology, highly abstract concepts such as identity and transience are conveyed in costume.

In the novel, *Jean-Baptiste Grenouille* is born in 1738 in Paris. Left to die by his mother, he is raised in an orphanage and, whilst growing up, the boy discovers his unparalleled sense of smell. After encountering a young girl with the most radiant smell, *Grenouille* is so overwhelmed by his desire to possess the scent that he kills the girl. Gradually, as her body withers, her scent, incorporating her identity, fades. *Grenouille* despairs and becomes obsessed in learning how to preserve scents.

During his journey to Grasse, the mecca of perfumers, *Grenouille* indulges in his own world and realises that he has no inherent odour. His whole worldview – based purely on scents – falls apart. 'What he now felt was the fear of not knowing much of anything about himself' (Süskind, 1994, p. 54). After this experience, *Grenouille* develops a number of human scents in order to create an artificial identity and blend in with people.

On his arrival in Grasse, the protagonist is introduced to the skilful art of *enfleurage*, a perfumery process that captures the scent of plants by immersing their fragrant components

in fat. However, *Grenouille* explores this technique to extract human scents, in particular, one of another young girl, *Laure*, who will turn out to be the keynote of his ultimate scent, the essence of beauty and life itself. From then onwards, he kills one girl after another – including *Laure* – extracting their scents to accomplish his twelve-note perfume.

Eventually, *Grenouille* is captured and sentenced to death. On the day of his execution, *Grenouille* uses the finished essence to beguile the audience and is pardoned. Disgusted by the nature of humans and overcome with the realisation that no-one except himself will ever understand the beauty of his masterpiece, he returns to Paris to commit suicide. There, he pours the perfume over himself and the people devour him in blind worship and self-dissolution.

Context and setting

The novel itself is set during the Age of Enlightenment, which lasted from the late seventeenth century until the outbreak of the French Revolution, in around 1798. Historian Sweetman contends that 'this era [Age of Enlightenment] has also been claimed as the period in which we in the modern age recognise ourselves.' (Sweetman, 1998, p. 1). This recognition is based on concepts such as freedom, individuality and identity, which are still defining values of modern-day societies but derive from frictions between the enclosed structures of the court autocracies and emergent open-minded societies in late eighteenth-century Europe. While the acknowledgment of these concepts has remained intact, modern society has a tendency to emphasise the visual features of one's individuality and identity. In contrast, the philosophy during the Age of Enlightenment increasingly understood the entire human sensory perception, including the sense of smell, as analytical tools. As Corbin highlights (Corbin, 1986) scents convey somebody's identity much more truthfully than their appearance could.

With a person's smell already being considered a unique fingerprint of identity, the perfumery business in the eighteenth-century flourished with 'the art of the parfumeur [being] one of masking and [a] secret means of revealing inner identity' (Corbin, 1986, p. VI). Yet, in eighteenth-century France, perfumery was a luxury item of the noble class. Expensive scents were withheld from the general population and differentiated into royal and bourgeois perfumes, with the latter merely functioning as air disinfection (Wiedenhöft, 2015). In fact, several therapeutic health characteristics were attributed to scents, which chemist Lemery elaborated in his *Pharmacopée Universelle*, concluding that smells were not only pleasant but penetrated the mind 'increasing the movement of animal spirits' (Doty, 2015, p. 14). These attributes may partly explain humans' fascination with scents and, as a result, the long history of the perfumery trade, with the perfumery technique of *enfleurage* being one of the oldest of its kind (Power, 2016). As part of *enfleurage*, natural products are immersed in cold layers of purified animal fat over days, absorbing the ingredients' natural oils until the fat has reached its required fragrance saturation (The editors of Encyclopaedia Britannica, n.d.). The resulting product is diluted with alcohol to gain the *absolute*, the essence of each perfume and the extract that the novel's protagonist, *Grenouille*, desires.

Within this setting of clear social distinctions but also of revolutionary new thought concepts, *Grenouille* explores the potential of scents. Through the realisation that he lacks inherent odour, the main character's self-perception, right down to his identity as human, are challenged. By utilising scent's power of reflecting and shaping identity, *Grenouille* creates several scents that simulate human identity. In accordance with Corbin's theory, the scent – now masking *Grenouille*'s lack of humanity – puts people around him at ease. The resulting social acceptability enables him to interact within his environment and eventually commit his crimes.

The immorality and ruthlessness of his murders add to the question regarding *Grenouille's* identity as human. In fact, the protagonist's ambitions are entirely fed by primary instincts – an observation that is reflected in Lemery's claim about the connection between scents and animal spirits. While *Grenouille* initially aims to capture identities with lifeless components, the results are not satisfying. Only the ruthless use of animate ingredients succeeds in delivering the essence of life necessary to create a sufficient mirror of the victim's identity.

Approaching the abstract

The search for identity is a concept that can be found in all aspects of art. Visualising the abstract, including aspects like identity, has repeatedly challenged and influenced both the fashion and art industries.

According to journalist van Twist (Evans, 2005), designer Hussein Chalayan has been one of the most ardent explorers pursuing the incorporation of philosophical concepts in fashion. Addressing the complexity of the term 'identity', the designer covered his models' faces with egg-shaped capsules in 2005 – robbing them of their identity, whilst simultaneously providing protection both physically and from the audience's gaze. It is a thought-provoking contrast, which was strengthened by other models on stage being framed by mirrors, forcing the audience to face their own reflection (Evans, 2005). In 2016, Chalayan approached the topic 'identity' from a different angle by dressing two models in uniform lab coats: only when exposed to water, the coats dissolved and revealed unique crystal-embellished dresses underneath. This performance successfully combined both uniformity and transience in one collection, showcasing the great theatrical potential in the use of water-soluble textiles.

Contemporary artist Lucy McRae incorporates science and technology within her work to explore human nature and, as such, human identity in unusual, artistic ways. In 2009 the

artist constructed a dress out of knitted plastic tubing for singer Robyn's new music video 'Indestructible' (McRae, n.d.).

Electric drill pumps fed hundreds of litres of coloured liquid through a tubing structure. The dynamic structure was wrapped around the singer Robyn by following her body shape. Through the liquid running at different speeds and changing colour, the whole set-up appeared like a living textile – evoking strong associations of veins and blood vessels encircling the singer.

Similarly to McRae, fashion designer Ying Gao's work also develops around the person. In her creations, Gao has integrated sensors and pneumatic mechanisms (Gao, 2006) into clothing. Interactive garments react to the participants' touch and inflate different panels of the garment, simulating the fluid movement of breathing. Gao manages to enhance the visual message of her garments by marrying technology and textile manipulation: By pleating individual panels of her work – similar to Japanese origami – the garments are able to open and close, enhancing the association with respiration.

In one of her following projects, Gao even equipped the garment with the technology to recognise the spectators' breath (Schmidt & Stattman, 2009). In response to the signal triggered from the detector, individual panels of the garment slowly unfolded.

While this project shows the visual power of incorporating smart technology in fashion, it was originally introduced in 2015 for medical purposes. However, tracking heart and breathing rates also provided potential for high-end sportswear, as electronic developers such as Samsung and Intel realised. According to the creators, the products were not only designed to improve the training experience of the user, but also support the wearer's health by monitoring stress levels, heart inflammations and coronary heart diseases (Sawh, 2017).

Developers promised that, by the use of sensors to transfer biometric data into an advice system, the user's awareness of individual mental and physical needs and, consequently, the wearer's lifestyle would improve.

Ironically, by relying on the aforementioned smart technology, people's relation to their own bodies and minds is further estranged, resulting in a distorted identity image. The initial conceptualisation of oneself, that feeds into one's personal notion of identity, is influenced by aspects like how we feel, look and act. According to Leary & Tangney (2012, p. 69) our identities then function as lenses which enable us to make meaning of external and internal factors and to put perceptions into immediate context. The increasing use of smart technology in people's direct proximity, e.g. in their clothing, could possibly lead to people subconsciously shaping their initial conceptualisation in response to sensors rather than to their own sensory perception.

Following the modern aspiration of increased synchronisation of mental and physical wellbeing, the next chapter of smart fashion will be to monitor users' biometric data to gain interpretations about their emotional and mental wellbeing (Gokey, 2016). While this development could be particularly promising in sectors where people cannot communicate their needs, e.g. patients with severe mental health issues and disabilities, it also comes with an increasing vulnerability and conditional identity image caused by the ultimate disclosure of the individual.

Unfortunately, a more thorough investigation into the potential and dangers within smart technology exceeds this article's capacities. However, the aforementioned incorporation of smart technology in art and fashion proved ideal to visualise the key themes of the project.

Evaluation

Usually descriptions in a performance's underlying script, that evoke strong visuals, e.g. the age of a character, their origins, whether they are poor or wealthy etc. are applied to the design choices behind a character's costume. In this case, mapped out through the initial analysis of the novel, the key themes of identity, scent and transience showed a strong potential for creating a thought-provoking, visually convincing costume. Corbin's claim (Corbin, 1986, ref. p. 8), that scents are able to convey an individual's identity more truthfully than their appearance, was a particularly intriguing starting point for the design process of a costume project. In order to visualise such an abstract concept, I had to refer to other artists for practical inspiration.

As elaborated in the introduction, the idea of a costume reflecting the wearer's identity is widely recognised – to create a costume bearing the entire identity of someone's inherent odour, however, was a concept that had yet to be investigated.

The document research showed the diversity in which abstract concepts such as identity and transience could be addressed in clothing, while also highlighting the theatrical potential for this project's unusual exploration of technology in textiles.

The project's setting was determined by the initial brief, which established a live theatre show as performance context. This condition implied that the project had to evoke strong emotions with the audience in order to be successful, but also that the costume had to be visible from all angles and that potential errors could not be edited out. Consequently, while McRae's concept of using enclosed water to create a dynamic costume built one of the key foundations for the project, the incorporation of huge pumps and kilometres of tubing structures was unfeasible. Chalayan's use of dissolvable fabrics on the other hand would have been an ideal approach for the visualisation of the project's key themes of transience

and scent. However, for *Perfume* to work in a theatre context, the garment had to be reusable.

Ying Gao's use of smart technology to create interactive clothing however, provided a starting point for the construction development of *Perfume*. The applied technology was hidden within the garment and interlinked directly with the model through sensors, hence, blurring the clearly separated identities of garment and wearer.

The use of additional means to shape someone's identity in order to feel a more accepted part of society, whether that may be scents in the eighteenth-century, clothing or sensors at present, indicates the power but also the danger of these resources. The concluding potential, of literally putting on and taking off identity, highlighted the novel's suitability for a costume-based project and established the research question:

Is it possible to create a dissolvable while also reusable garment for theatre, in accordance with the available financial and technical resources within the given timeframe?

Realisation

The project is based on the murdered girls in the novel *Perfume: The Story of a Murderer*. The description of their personality and appearance, as well as the murderer's character profile influenced the design, textile and construction development profoundly. Both characters could not be treated as separate entities as they are irrevocably linked: *The girls'* scents represent *Grenouille's* sole ambition and reason for living while their essence can also only be acknowledged by the murderer himself.

Throughout the novel, *Jean-Baptiste Grenouille* is characterised by his murders, which are triggered as a result of his passion and immoral obsessions. While expanding his skills and knowledge, he delights in his talent, being 'in very truth his own God' (Süskind, 1994, p. 93).

Grenouille perceives himself as a genius – a connoisseur of beauty and scent, a true craftsman in capturing the scent and essence of the surrounding world – rather than a murderer. While despising all other people, he craves to be acknowledged as his true self. This longing fades throughout the novel as he realises that he and his masterpiece, the ultimate perfume, will never be acknowledged by society.

The ingredients to his masterpiece, *the girls*, have no stand-alone personality in the novel. To the reader their personality becomes as replaceable and vague as their person is to *Grenouille*.

The victims' identity only has value in its 'ripening' process, perceptible in their inherent odour – the metamorphosis from a girl's innocent and pure body into that of a woman. This natural transformation is portrayed as deeply sensual, far more enticing than a sexually fully developed woman. The first time *Grenouille* smells one of his victims, he has the foresight of a scent that is not only the link to all other odours but also to the essence of life. These girls become something holy to him, an icon whom *Grenouille* wants to strip of its odour and wear himself. This idea highlights that *Grenouille* does not perceive his victims as humans but as sheer means to his final goal, as objects. In addition to the simplified description of *the girls* in the novel, reducing them to naivety, innocence and beauty, their already mentioned objectification matches the decorative status of women during the first half of the eighteenth-century. Without personality of their own, *the girls* serve as canvases on which *Grenouille* projects his aspiration to the 'higher principle'.

The following visualisation of the character aims to reflect the contradiction between the sensuality of the ripening process and the brutal objectification of *the girls*.

Design

As outlined previously, the novel *Perfume: The Story of a Murderer* is pervaded with elements of transformation and identity: abstract themes that can only be translated into a garment via evoking emotions and associations with the audience.

In order to convey the project's interpretation, the use of colours, volume, texture and the movement of the garment had to be chosen carefully.

The late eighteenth-century setting of the novel provides striking, inspiring fashion as a starting point. Its hooped petticoats, voluminous and ornate dresses (i.e. the fashionable *mantuas* of the late seventeenth to eighteenth-century), rigid corsets and stomachers do not only tell a journey of beauty and class but also of restrictions and illusion. A seemingly opposing combination that bears strong links to *Grenouille's* aspirations. Within the book, to extract *the girls'* inherent odour, the protagonist confines their bodies in huge vessels filled with fat. Despite the strong visual imagery, the literal use of fat in a costume for a stage performance had to be classed as impractical. However, the visual incorporation of contained and restrained life in the design could be achieved through the eighteenth-century silhouette. In addition to the appropriate symbolism, the inclusion of eighteenth-century fashion proved vital for practical purposes as discussed later in this article.

Within the novel, *the girls* only possess identity within their scent. *The girls* themselves providing mere vessels for the essence within. This revocation of any value as a person, once again leads to objectification and facelessness. The resulting anonymity is visualized through the use of masks – a design choice already made by Chalayan in his collection in 1998.

However, *the girls* are more than just ingredients to *Grenouille*. Their scent is his religion, his reason to live. The icons he sees in these girls are pure and delicate, the essence of

beauty. To visually support this association evoked by the script, the colour palette was kept in light, natural shades, dominated by the colour of innocence itself, white.

Transience and scent however – as underlying themes of the novel – could not be entirely translated into a garment through shape, colour or accessories. Just as both transience and scent are characterised by their ever changing state, the garment had to metamorphose by naturally disintegrating – an act of transformation that had not yet been explored in a theatrical costume.

The dissolving fashion of Hassan Chalayan and the scientifically inspired garments by Lucy McRae provided inspiration on how to approach the disintegration process but were not applicable in a theatre performance context. Instead, in various interviews and experiments, the idea was developed of using fabrics in combination with water-soluble thread. Using the thread in key structural points of the garment meant that it would collapse when exposed to water but could also be easily restored. However, traditionally, costumes for the stage are made to last. The choice of cloth is vital, with top fabrics often being backed to offer additional strength and support. Hence, creating a costume with water-soluble thread could be classed as impractical for theatre use and, as a result, within the world of costume there was no prior use of the material that I could refer to as guidance. Consequently, I needed to start my own series of experiments in order to make the water soluble thread work in my costume.

The administration of the water had to happen either externally as part of the show or be technologically implemented from within the costume. Traditionally, theatre performances aim for an effect on the audience that translates from distance. From this aspect the use of external tools to trigger the disintegration would have been sufficient.

However, the novel and as a result the project itself are dominated by concepts such as scent and identity, factors that come from within a person. In order to stay true to these concepts, the decision was taken to power the water from within the garment which clarified the technical direction of *Perfume*.

Figure 1

Costume design before and after disintegration (author's image)



Construction

Powering the disintegration process internally instead of externally – against all theatre customs – complicated the mechanism behind the disintegration enormously. The technical components had to be discreet enough to not disturb the visual effect of the costume, the mechanism could not be too complicated or time consuming in order to work in a performance context and the whole set up had to be within the project's financial scope.

If the water was to come into contact with all key points of the garments, it had to be transported through a tubing structure in the undergarment. By piercing water soluble thread through the tubing, one could attach the top garment to the structure. As soon as a water pump was activated, the waterflow in the tubes would ensure the disintegration of the top garment with the performer being left with blank undergarments – once again conveying no individual identity.

Problematically, by piercing tiny holes in the tubes for the soluble threads, the necessary air pressure for the circuit was challenged. In response, the tubes had to be made of suitable material with the right diameter and length. Even more importantly, the water pump had to be powerful yet light enough to counteract the dropping air pressure and cover several metres in height.

To activate the pump itself, I still had to manually press a button. Ying Gao's use of breathing sensors provided an alternative solution. If a breathing detector could trigger panels of a garment to unfold, there had to be a way that it could also trigger the disintegration of a garment. In fact, a self-destruction process by breathing related directly to the novel as people 'could not escape scent. For scent was the brother of breath. Together with breath it entered human beings, who could not defend themselves against it, not if they wanted to live.' (Süskind, 1994, p. 61).

Unfortunately, commercially advertised breathing sensors exceeded the project's financial resources and, also, my entire research did not produce any examples of interactive sensors being used in theatrical costume. Without any existing prototypes to be guided by, prior technical knowledge or literary back up, the solution had to be developed by trial and error. Through various interviews with technicians, a simplified detector utilising conductive sensor cords in combination with an Arduino controller board could be constructed. Aside from the financial benefits, using an Arduino meant that the activation and also disruption of the pumping process – and hence the disintegration – could be controlled without any choreographed actions during the show.

Due to the combination of water and electricity, the development of a stable framework separating all the components had to be a priority. The construction of the desired

eighteenth-century silhouette with its top and undergarment, consisting of petticoat and corset, provided the ideal foundation for such a structure: The rigidity of the hooped petticoat served as a frame for the tubing structure, which was further strengthened with steel wire to achieve the desired volume and height, while the corset was stiff enough to anchor the tubes running through the shoulder piece.

For the pumping process to work, the pump had to be entirely submerged in water at all times. Therefore, I integrated two containers in deep pockets on both sides of the petticoat – one containing all electrical components while the other held the water and pump.

When connected to an electric circuit, a flexible sensor cord conducts electricity. Once stretched, the electrical resistance increases as the current has to cover a bigger distance. If connected to an Arduino, one can utilise the received data as a trigger.

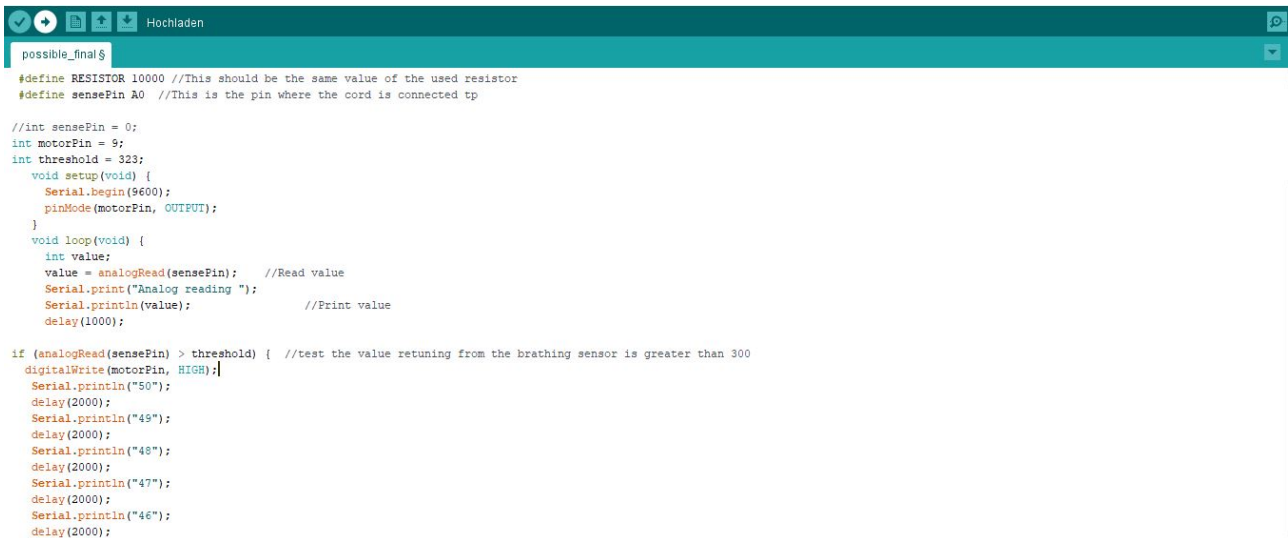
As the performer was put in a corset, their breathing had to be naturally impaired. To polarise the difference in the received data, the cord was situated tightly under the bust, where the ribcage is maximally dilated.

In order to connect all electrical components – pump, Arduino, sensor cord as well as batteries for both pump and controller board – I added a relay switch as crossing point.

In a relaxed state, the measured resistance was 310 Ω going up to 330 Ω with heavy breathing. Accordingly, the threshold – the activation point for the Arduino programme to set off the pumping process – was set to 323 Ω as shown in the final coding:

Figure 2

Arduino code (author's image)

The image shows a screenshot of an Arduino IDE window. The title bar at the top reads "Hochladen" and "possible_final\$". The main area contains the following C++ code:

```
#define RESISTOR 10000 //This should be the same value of the used resistor
#define sensePin A0 //This is the pin where the cord is connected tp

//int sensePin = 0;
int motorPin = 9;
int threshold = 323;
void setup(void) {
  Serial.begin(9600);
  pinMode(motorPin, OUTPUT);
}
void loop(void) {
  int value;
  value = analogRead(sensePin); //Read value
  Serial.print("Analog reading ");
  Serial.println(value); //Print value
  delay(1000);

  if (analogRead(sensePin) > threshold) { //test the value returning from the breathing sensor is greater than 300
    digitalWrite(motorPin, HIGH);}
    Serial.println("50");
    delay(2000);
    Serial.println("49");
    delay(2000);
    Serial.println("48");
    delay(2000);
    Serial.println("47");
    delay(2000);
    Serial.println("46");
    delay(2000);
```

After constructing the undergarment, serving as the framework for all the technical components, I focused on the development of the top garment. In order for this to easily disintegrate, it had to be made up of individual textile pieces instead of one continuous garment. To visually enhance the disintegration process, the textiles of the top garment had to be so lightweight that, when falling onto the ground, they would turn into an unrecognisable 'puddle' of fabric.

Experiments with different materials revealed that only select polyester chiffon had the right properties: the fabric was light enough to create the desired movement while also keeping its shape when 3D manipulated.

Inspired by Ying Gao's use of pleats to increase the mobility of her garments, the bodice was assembled using origami techniques while the majority of the top garment was French smocked.

The latter embroidery technique created textiles of great delicacy and transparency, evoking associations of sensuality and scent. More importantly still, the technique gave the chiffon

enough structural strength to achieve the desired definition and volume when supported by additional tulle smocking, while collapsing into undefinable pleats when dropped.

To evoke a more natural, uneven disintegration, I constructed the skirt from layered panels of smocking that were connected with the dissolvable thread to the tubing structure. When the water circuit started flowing and individual threads dissolved, singular panels dropped, changing the movement and look of the entire skirt.

Figure 3

The costume dissolving (author's image)



Adjustments

Due to the empirical nature of the project, one development process determines the next. While this approach enables the maker to react flexibly to differentiating circumstances it also comes with uncertainty. While the developed prototype disintegrated successfully in response to the performer's breath in an artificial testing environment, the sensor caused problems when test-run under the final show conditions.

Firstly, the sensor cord stretched out further with every test run which implied that the Arduino code had to be readjusted each time. These adjustments were not only time consuming but also difficult to undertake as the technical components were hard to reach under the different layers of the garment. Secondly, the sensor did not only respond to heavy breathing but also to coughing, sneezing or laughing which resulted repeatedly in unexpected disintegration.

These technical flaws showed that the prototype was unsuitable for the set out performance area but that, ideally, the costume would have been presented as part of an art installation and would have dissolved entirely there and then. The beauty of this approach would have been the emphasised irreversibility of the disintegration process – first showcasing the presence of the garment and then highlighting the lack thereof while a trace of its former identity, similar to a note of scent, lingered.

However, due to the set out requirement that the garment had to be worn multiple times for theatre, the project's concept had to be reassessed.

The most sensible solution within the tight time frame and the limited financial budget was to add a small push button. This button was secured to the performer's body and connected to the relay switch instead of the sensor cord. The Arduino was reprogrammed to switch on in response to the pushed button, linking the pump and battery for the length of the choreography before automatically disconnecting.

While this approach had several benefits – including that the performer was in full control of the disintegration process, the majority of the existing technical setup could be used and the danger of a false release was eliminated – the literal connection of breath and dissolution process was no longer present.

Conclusion

From the beginning, this project has used the original script as the main source of inspiration. While the novel's setting and storyline are dominated by obsession and death, it is also filled with beauty and creativity. This intriguing contrast demanded a project that would unite both worlds in its disintegration and innovation.

Despite having to commit to compromises, the challenging concept of creating a self-destructive garment that responded to the performer's breath, including the construction and incorporation of a breathing sensor, had proven successful.

While the initial approach related directly to the scenario of *Grenouille's* victims enticing their murderer through their inherent odour – which links directly to their breathing as elaborated on page 19 – the developed prototype could not meet the practical requirements. Despite the beauty of the initial concept, the project's goal was to create a functional theatre costume. When this functionality was challenged the project had to be adjusted.

However, the developed prototype proved that there is a place for the application of new technology in costume. When introduced to the public, the prototype excited and inspired people. By interlinking the visual experience of the costume directly with the performer's breathing, it evolved into an immediate expression of the performer living: it moved and breathed alongside the performer and, in the end when disintegrating, took away the entire entity's identity. Only in its dissolution did the costume's independent existence and function become evident, answering the hypothesis set out in the introduction: a costume really can find completion in its disintegration.

Traditionally, costumes aim to dress a person and, by enhancing their characteristics and background, assist in feeding the storyline. However, it is rare to find a costume aiming for the visualisation of the abstract, such as the concepts of identity, scent or disintegration explored in *Perfume*. Through my project and the reaction it received, I could see the value

of this approach: as the costume did not try to portray a specific character, it was open to interpretation. While not every person – when asked – had realised that *Perfume* had tried to create a costume about identity and scent, all associated it with something abstract. The costume became a canvas for the audience's thoughts and interpretations – in a way that is similar to *the girls* being a canvas for *Grenouille's* dreams and aspirations in the novel. This is a phenomenon comparable to those that can be witnessed in fine arts. Art requires interaction with the spectator in order to come to life, while people need the interaction with art to feel and reflect.

Throughout the development process of *Perfume* the costume became less and less of a garment but perpetually more of an art piece. The connection it built to the audience, the emotions and thoughts it triggered, made it a strong example for the validity of abstract concepts in theatrical costume. After all, is it not the aim of theatre to convey a story? What better way to do so than with a costume that engages people by inspiring their curiosity and wonder – and hopefully making them think.

Perfume has succeeded in combining traditional and new craftsmanship, bridging the fields of costume, art, technology and science. This connection of different sciences and crafts leads back to the starting point of the project's development process: to a time of drastic cultural and social change and to a protagonist's quest for the ultimate essence.

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