UrbanIxD: From Ethnography to Speculative Design Fictions for the Hybrid City

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ABSTRACT

This paper presents research in the field of Urban Interaction Design which seeks to understand how people's personal, emotional relationships with urban places could potentially inform the design of new technological devices and services. A Speculative Design approach is taken by creating Speculative Design Fictions informed by the data gathered using the ethnographically-informed Walking & Talking method. However, creating the crucial link between themes in the data corpus and possible future scenarios for Speculative Design Fictions can be challenging. Building outwards from a sophisticated understanding of the approach, this paper presents a case study which focuses on the step-by-step process of designing and creating this crucial link for a Speculative Design Fiction in the form of a short film, using design techniques such as Tactics for Ambiguity, PACT-analysis and SCAMPER.

CCS CONCEPTS

• Human-centered computing~User centered design

KEYWORDS

Urban Interaction Design, Place Attachment, Speculative Design, Design Fictions, Emotion, Urban Place, Smart City, Ethnography, Walking & Talking method, Design Techniques, Ambiguity, PACT-analysis, SCAMPER.

1 Background

The vision of ubiquitous computing [52] is becoming increasingly realized through smart city solutions, the Quantified-Self movement and the proliferation of smartphones and smart watches. This adds a new technological layer to the pre- existing infrastructure of the urban environment, creating a hybrid city in which the physical world and the digital world come together. This technological layer offers novel opportunities to augment our experience of the urban environment [8]. Complementary to the traditional technology-driven, top-down smart city approach, *Urban Interaction Design* takes a bottom-up, human scale design approach to designing smart cities. It aims to identify the needs, desires, routines, behaviours and experiences of people in the smart city of the (near) future, to inform the design of innovative technological devices and services [45,44] The focus is on city making; people as engaged citizens using technology to create pleasant cities economically, socially and culturally [18]. Therefore, there is a growing need to create better understanding of the relationship between person, place and technology [46].

There has been an increased focus in the field of Urban Interaction Design on emotion and affect, to create a better understanding of people's experience of the urban environment, and to inform how technology could play a role in augmenting people's urban lived experience. This is illustrated by propositions for an affective framework for smart cities [21], route planning applications attempting to determine the most quiet, beautiful or happy walking routes through a city [38], and a multitude of urban HCI studies and applications. These studies aim to mediate feelings of personal safety [5,34,41], traffic safety [39], or to assist situated remembering in an urban context [15,29].

Inspired by artist Christian Nold's work on bio-mapping [32] and emotional cartography [33] and the rise of the Quantified-Self movement [24], there is an increased interest in exploring how mobile, wearable and Quantified-Self technology could be used to capture and collect people's emotional experiences of urban places [28,38,39,40,47]. There is also potential for sharing this personal data with other people using innovative technological devices and services [1,22,29,31,32,33,48,49]. Based on social science studies on the concept of place attachment [16,27,42] and these urban HCI studies attempting to leverage people's emotional experience of the urban environment, it can be argued that places that are meaningful on a personal level could provide a suitable lens for further investigation, as these personally meaningful places are typically the places that a person has a strong emotional bond with [48].

2 Exploring Emotion and Person-Place relationships in the Urban Environment

In the social sciences, research has centred on various person-place related concepts. *Place* is often defined as a meaningful location [23], with *place meaning* developing from people's positive and negative experiences and emotions in places [27]. This can result in *place attachment*, a multidimensional concept which characterises the emotional relationship between individuals and their important places [26]. This paper outlines ongoing work where the overall aim is to understand how

people's experiences of places in the urban environment that are meaningful to them on a personal level, for example the pub where they have met their partner, or the dark alley where they got mugged, and in particular their personal stories and emotions connected to those places, could potentially inform the design of future technological devices and services. The ongoing work investigates (1) the variety of personal emotional meanings connected to people's personally significant places in the urban environment; (2) how to collect, represent and communicate those personally meanings (i.e. the different forms this data can take); (3) the potential for sharing this personal emotion data with others (e.g. strangers, friends, and family); and (4) and how these emotional person-place relationships could potentially inform the design of future technological devices and services using Speculative Design Fictions.. This paper we will focus on the fourth objective as the first three have already been addressed and discussed in previous work.

2.1 Methodology

To meet the overall aim, an ethnographically-informed Walking & Talking method was designed and implemented to investigate people's current emotional person-place relationships with personally significant places in the urban environment to create a better understanding of the urban context [46]. Subsequently, a Speculative Design approach was taken to explore how the trends and themes that emerged from the qualitative data could potentially inform the design of future technological devices and services. Speculative Design Fictions were created by projecting those trends and themes into multiple possible future scenarios.

To investigate people's emotional person-place relationships with personally significant places in the urban environment, semi-structured interviews were conducted, consisting of three parts. In the first part, an evaluative map technique was used to identify where people's personally significant places are located in the city and to articulate the type of experiences participants had in these places that make them personally meaningful. On a paper map of the city, participants were asked to indicate the location of five personally significant places, their home, workplace and typical routes they would take to traverse the city. Based on the outcome, a walking route was generated for the second part of the interview.

The second part of the interview used the ethnographical-informed Walking & Talking method [46] to elicit qualitative measurements, in-situ, of the subjective emotional experiences that participants had in their personally significant places and to further contextualize their personal stories connected to those places. The participant would take the researcher on a walking tour along the personally significant places selected by the participant. Being in-situ allowed the use of environmental cues to act as a catalyst for the memory to recreate and relive in-place experiences and made it easier for participants to identify the emotions connected to their personally significant place. The Plutchik Emotion Wheel [35] was used to enable the in-situ identification of emotions and to help participants to verbalize them (Figure 1). Semi-structured interview questions were used to investigate how participants would like to represent their experience of a place, the different forms this data could take, and the types of social relationships where participants would be willing to share this data with.

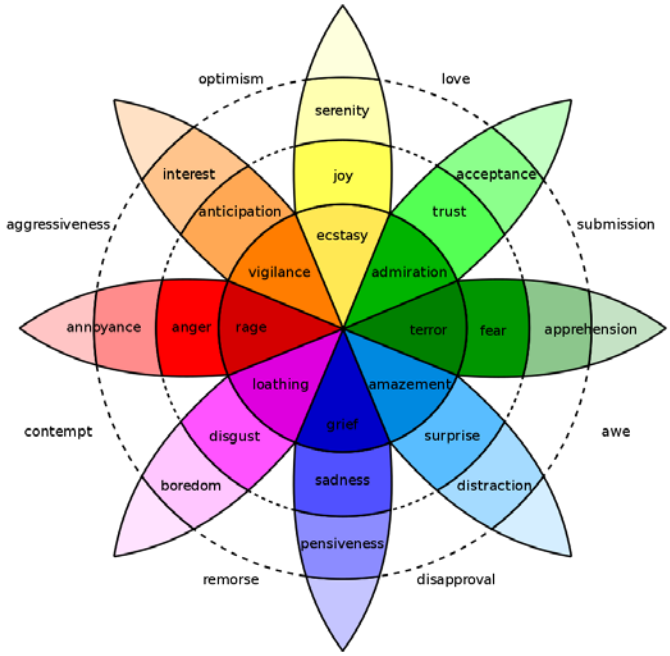

Figure 1: Plutchik Emotion Wheel, a visual lightweight tool containing the eight basic human emotions (joy, trust, fear, surprise, sadness, disgust, anger & anticipation), at three different intensity levels. Redrawn from [36].

After completing the walking interview, the third step took a Speculative Design approach. Based on data collected during a pilot study, an emotion map containing different types of emotions connected to places in the city, from people that the participant has different types of social relationships with (e.g. strangers, anonymous friends, identifiable friends and their partner), was presented to the participant as a provocation (Figure 2). The aim was to investigate the influence of different types of social relationships connected to a place, and the different types of emotions connected to places, on people's curiosity when exploring this personal data.

Figure 2: Emotion Map of Edinburgh, used as a provocation in a Speculative Design approach. Emotions depicted on the map, using their corresponding colours on the Plutchik Emotion Wheel, include Distraction, Anger, Serenity, Optimism, Love, Acceptance, Joy, Surprise and Sadness.

2.2 Results

A study was conducted with 8 participants in Edinburgh (UK) over a period of eight months, which resulted in a study of 40 personally significant places in the urban environment. Participants were recruited using a networking procedure following the recommendations and eligibility criteria defined by Manzo, demographically diverse and had been living in Edinburgh for periods ranging from 3 years up to their entire lifetime [27]. The interviews were recorded on video (with audio) using a GoPro camera, resulting in over 23 hours of video transcribed. The gathered data corpus consisted of rich, contextualized and intimate qualitative data regarding participants' emotional person-place relationships in Edinburgh. The quote below illustrates the personal relationship that one of the participants has with a specific bridge in the city centre.

> *"The thing about Edinburgh is a lot of people leave. It's great for a year, experience – then people move. So I've had to reinvent myself several times. I've lived with seven different housemates and arrangements in housing, so it's a lot of change. I wasn't enjoying it, and I felt trapped because of the PhD because I had to stay. And I remember there was the Christmas markets and the castle was lit up. I remember just standing on the bridge and thinking, 'snap out of this'. So whenever I feel like I want to go home, I think of that viewpoint. […] It was the first time I felt like I belonged. I felt part of something. [..] You'll have me in tears at the end thinking of all my lovely memories of Edinburgh!"* **- P5, Irish, 27, female, PhD student, on North Bridge**

The data corpus was subsequently analysed using a thematic analysis, resulting in trends and themes clustered around the following topics: past and present emotional experiences connected to personally significant places; the evolving meaning and relationship with personally significant places over time; the different representations of person-place relationships (i.e. different forms data could take); and the potential for capturing, sharing and exploring data in the (near) future using innovative technological devices and services. The quote above illustrates a trend in the emotional experiences of personally significant places identified in the data, namely an experience of not belonging and feeling homesick, and the viewpoint from a particular place (i.e. a visual representation) being able to alleviate those feelings. The focus in this paper is on how the trends and themes identified in the data corpus gathered by the ethnographically-informed Walking & Talking method, could potentially inform the design of future technological devices and services, by projecting those trends and themes into multiple possible future scenarios using Speculative Design Fictions.

3 From Ethnography to Speculative Design Fictions

Speculative Design is a critical, discursive design practice, based on critical thinking and dialogue, which questions the practice of design and its modernist definition, and envisions possible future scenarios [30]. Speculative Design and, specifically, Critical Design and Speculative Design Fictions have been extensively employed in HCI as a way to reflect on future technologies or critique current practice [6,7,12,17,37,43]. This study applies a Critical Design lens to the Speculative Design by creating a suite of Speculative Design Fictions in the field of Urban Interaction Design. This enables reflection on current practices around people's urban places that are meaningful to them on a personal level, and to speculate on the potential desirable and undesirable implications of innovative technological devices and services on our emotional experience of, and relationship with, urban places in smart cities of the (near) future.

There are three key elements to Speculative Design as identified by Auger [2]. Firstly, we need to move away from the constraints of commercial practice steered by the market and industry, meaning the focus should not be on the applications of technology, but the implications of technology. Secondly, the use of fiction to speculate on future products, services, systems, and worlds; reflectively examining the role and impact of new technologies on everyday life. Finally, the ability to initiate a dialogue between experts, such as scientists, engineers and designers, and the audience, as the users of these new technologies [2].

Speculative Design Fictions (also often referred to as "design fictions" or "fictions") are a specific genre of Speculative Design which finds its origins in science fiction [4]. Bruce Sterling defined them as the creation of stories that speculate about social practices that may be constructed around and through designed artefacts and systems (i.e. diegetic prototypes) [50]. The Netflix series Black Mirror could be seen as an example of Speculative Design Fictions. Each episode is based on a current technological trend and that trend is projected into the (near) future by creating

an often dystopian science fiction story in the form of an episode of a series. However, unlike Black Mirror episodes which depict a dystopian future for dramatic effect, Speculative Design Fictions do not need to be dystopian. They could also be utopian or anything in between.

More importantly, Speculative Design Fictions need to be grounded in science fact. A key aspect is the construction of the *perceptual bridge* by which designers engage their audiences and provoke an emotional response, which requires careful crafting and management of the speculation [2]. The creation of this link between science fact (trends and themes) and science fiction (the projection of trends and themes) is a crucial step in the creation of Speculative Design Fictions and can be a challenging task, especially without a team of designers at hand. Speculative Design Fictions tend to remain black boxes, leaving them vulnerable to criticism that they are "made up" [25]. This paper focuses on the step-by-step process of creating this perceptual bridge. Several design techniques will be discussed that can be used to project trends and themes grounded in science fact into possible future scenarios, and to create the provocation that aims to evoke an emotional response to engage the audience in a discussion. A case study will be presented in which these design techniques are used to create a Speculative Design Fiction in the form of a short film.

3.1 Why Speculative Design?

There were several reasons for taking a Speculative Design approach. The philosophy and approach of Speculative Design and Urban Interaction Design align. As Speculative Design aims to move away from the commercial practice steered by the market and industry, Urban Interaction Design aims to move away from the constraints of industry and their traditional top-down, technology-driven smart city approach. Instead, Urban Interaction Design is a bottom-up human-centred design approach which focuses on the needs, desires, rituals, human activities, experiences and behaviours of the citizens in the smart city of the (near) future, where the smart citizens are in control. Therefore, the focus is on implications of technology rather than the applications. In addition, both Speculative Design and Urban Interaction Design focus on problem finding, rather than problem solving. Urban Interaction Design aims to create a better understanding of the triangular relationship between person, place and technology to understand how technology could augment the urban experience. Furthermore, Speculative Design and Urban Interaction Design both aim to engage the public and non-experts with an unfamiliar design space. A survey conducted by the Institution of Engineering and Technology (IET) in May 2016, showed that 82% of British people do not know what a smart city is [13,19]. A Speculative Design approach enables the public to engage with this unknown, future world.

A Speculative Design approach also enables the exploration of multiple themes that emerge in the data corpus to explore the design space [4]. A key aspect of Speculative Design is that there is not just one future but a whole taxonomy of multiple different futures [10]. Speculative Design uses Gaver, Beaver and Benford's concept of ambiguity about the future as a resource for design [14], by crafting multiple futures that are engaging and thought provoking. These multiple future scenarios enable designers to go beyond the limits of current technology and speculate about what kind of interactive devices and services we might have in each of those futures, and what the implications and consequences might be. People are required to interpret these possible future scenarios for themselves, encouraged to start making sense of those future technologies and their contexts conceptually, and what the meanings and implication of those technologies might be for them personally. The ambiguity is in the interpretive relationship and requires people to participate in making meaning, without imposing a result, solution or outcome [14]. The fact there are multiple futures instead of just one, means people can more freely react positively or negatively to each of the possible future scenarios in the Speculative Design Fictions.

Indeed, not all possible futures are equal. As defined by Dunne and Raby [10], there is the probable future, which is the traditional design space; the plausible futures, which are alternative futures linked to how the world is today but are perhaps less probable; and the possible futures, which are more extreme scenarios of what the future might be like which are still scientifically possible (Figure 3). Each of the trends and themes identified in the data corpus can be projected into one of these future scenarios. A Speculative Design approach is used to discuss with the general public and non-experts which would be preferable and which would be undesirable [10].

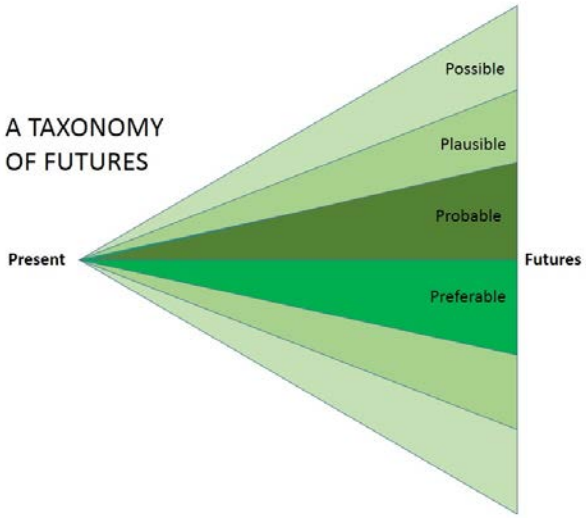

Figure 3: Taxonomy of multiple futures. Redrawn from [10].

3.2 Crafting the Speculative Design Fiction

This section discusses how one of the themes identified in the data corpus was projected into a future scenario using Critical Design. Critical Design is a specific approach to Speculative Design, which uses design as a medium to engage audiences, evoke an emotional response and ask carefully formulated questions as a catalyst for discussion [9]. These conversation pieces aim to

provoke thought, reflection and discussion on both the present and potential futures. This section demonstrates how several design techniques such as Gaver, Beaver and Benford's (2003) Tactics for using Ambiguity, PACT-analysis and the SCAMPER-technique could be used to this end.

This case study discusses a theme that emerged from the data corpus, gathered using the ethnographically-informed Walking & Talking method, namely the desire of participants to represent their emotional relationship with places using non-visual representations (e.g. smell, taste, audio, tactile). Of all these non-visual modalities, smell was the most popular among participants, with half of the participants indicating a desire to represent at least one of their emotional experiences with a smell if there would be a future technology available. Therefore, smell will be the focus in this study. During the walking interviews, participants had identified and selected nine different smells connected to personally significant places; the smell of flowers in general, daffodils, wet grass, an "autumnal" smell, cannabis, the "smell of summer", cherry blossoms, Greek food, and the smell of mulled cider. This led to the creation of a Speculative Design centred on innovative smell technology that would enable people to capture, consume and share these smells with others in the urban environment.

3.2.1 Using PACT-analysis for the design of the speculative smell technology. To develop a Speculative Design Fiction around this speculative smell technology and ensure the design would be grounded in and informed by the analysis of the data corpus, a method called PACT-analysis was designed. This method for analysis and design activities is often used in UX design and interaction design to scope out the problem and the variety of the different elements of PACT, (People, Activities, Contexts and Technologies) that are possible or likely in the domain. This is done by using brainstorming and envisionment techniques, typically combined with data gathered through observations, interviews or workshops [3]. This provided a framework for envisioning what this speculative smell technology might be like based on the data, who would use such technology, the different places and contexts it could be used in, and to what end.

Looking closer at the 'Contexts' element of PACT, seven of the smells were connected to a specific park that is popular among locals, but is not well-known by tourists. One smell was connected to a Greek restaurant (the smell of Greek food) and one was connected to the local Christmas market (smell of mulled cider). These smells evoked emotions of joy, ecstasy and relaxation among participants. Further analysis revealed that some of these smells were linked to a specific season (e.g. autumnal smells, smells like summer, wet grass, flowers, and mulled wine). Examining the data corpus through the 'Activities'-lens of the PACT-analysis revealed that the smells were typically encountered while socializing with friends in the park (e.g. having BBQ), or while doing activities on their own (e.g. walking the dog or going for a run), which grounded them and enhanced their experience of that place. However, some smells where linked to a different location, for example the smell of daffodils was linked to Ireland and the smell Greek food was linked to Greece. These connections alleviated the feeling of homesickness, enabling participants to mentally escape the place they were in. Further analysis of the 'People'-component revealed that three of the four participants who would like to represent their relationship with a personally significant place with smells, were not originally from the UK. These smells would make them feel like they were back in their home country, as illustrated by the following participant quote:

> *"In springtime, there's lots of daffodils [in the Meadows]. I would have picked the smell of a daffodil. They remind me of home in Ireland, so there you go. And because I'm from the countryside as well, in the Meadows I feel like I'm away from the city again."* - **P7, 29, Irish, female, PhD student, in the Meadows park.**

This inspired and informed a future scenario, where innovative smell technology would be used to either enhance the experience of the place a person is in, or to consume smells of other times and places to mentally escape the place the person is currently in.

3.2.2 Using Tactics for Ambiguity and the SCAMPER-technique for creating provocation. Having the Speculative Design Fiction firmly grounded in the analysis of the data corpus and projected into a future scenario is not sufficient. An important part of Critical Design is to provoke the audience and evoke an emotional response, which will enable the Speculative Design Fiction to act as a conversation piece for discussion, provoking thought and reflection on both the present and the potential future it depicts. To do this, the SCAMPER-technique and Gaver, Beaver and Benford's Tactics for using Ambiguity were used. The motivation for using the SCAMPER technique, is that it is a creative brainstorming technique which is typically used in interaction design to develop atypical solutions to problems and spark creativity [11,20]. First, 'Substitute' enables the removal of part of an accepted concept, device, or situation and replacing it with something else. 'Combine' encourages the joining or forcing of two elements together and consider ways in which this combination might work towards a solution. 'Adapt' encourages the adaptation of part of the problem so that it works where it did not work before. 'Modify' (sometimes known as 'Maximize and Minify') encourages the modification of an attribute, randomly if necessary. Any attribute could be modified, such as size, shape, colour, texture, history, attitude, position, etc. 'Purpose' (sometimes known as 'Put to other use') relates to changing the intention or use of the subject. 'Eliminate' refers to the (potentially arbitrary) removal of any or all elements of the subject, to simplify or reduce it to the core functionality. Finally, 'Reverse' or 'Rearrange' changes the direction, orientation, order or hierarchy in which the subject was going to go or intended to be used [11,20].

The motivation for using Gaver, Beaver and Benford's Tactics for using Ambiguity is that it has been used in interaction design to encourage close personal engagement with interactive systems. It discusses three types of ambiguity, namely ambiguity of information, of context, and of relationship. It provides several

heuristics or tactics for achieving each of these types of ambiguity to help designers recognize, understand and use ambiguity. Enhancing the ambiguity of information focuses on tactics for creating or reflecting uncertainties that are noticeable by people. This tactic could be used to make the device or service look mysterious or impressionistic, but more importantly it can engage people into making sense of the technological device or service and the context and environments in which it operates. Creating ambiguity of context is a tactic which blocks the interpretation of a technological device or service in terms of an established discourse. This enables people to approach a particular technological device or service with an open mind and to question the assumptions they have about this technology. Finally, provoking ambiguity of relationship is a tactic which creates the conditions for a deeply personal projection of imagination and values onto the design of the technological device or system. This allows technological devices and systems to enable self-reflection by letting people take on new roles or new identities to change perspectives and question their own values and activities [14].

In this specific case study, the Technology element of PACT is used to create the perceptual bridge which links the familiar present with the unfamiliar future. This perceptual bridge is used to engage audiences and provoke an emotional response, which requires careful crafting and management of the speculation. The initial idea was to simply add a speculative smell sensor to existing smartphones, allowing people to capture smells alongside pictures and videos. This would link familiar smartphone technology with the unfamiliar future smell technology. However, to make this particular Speculative Design Fiction more provocative, the SCAMPER-technique of "Put to other use" was used along with the tactic of creating ambiguity of context, by blocking expected functionality to comment on a familiar technological device [14]. A future scenario was created where all smartphones and cameras are replaced by "smellsticks", without explaining why. This sole focus on smells without offering an explanation as to why smartphones have been replaced by this speculative technology is a tactic to provoke ambiguity in the relationship, and encourages the audience to reflect on the meaning of smells in their environment; aesthetically, culturally and personally [14]. The perceptual bridge is created by linking the use of this unfamiliar, future smellstick technology to the use of the familiar, present technology of smartphones. In this future scenario people use their smellsticks to capture, consume, share and relive their emotional experiences connected to personally significant urban places using smells instead of pictures and videos. Also, by setting the future scenario in the same city (Edinburgh) as the intended local audience and balancing the familiar present with the unfamiliar future, this ambiguity is designed to attract the audience to engage with this future scenario [14].

It is important to stress that Speculative Design is not about the application of (smell) technology, but about the potential implications of (smell) technology. It is not a prediction that there will be such smell technology in the future, nor that there should be smell technology in the future. This is just one of many possible future scenarios, which may or may not be probable or plausible. It is up for discussion if such a future scenario would be desirable or not. Using the tactic of provoking ambiguity of Relationship, disturbing side effects of speculative smell technology are introduced alongside positive aspects. Using the "Reverse" and "Put to other use" of the SCAMPER-technique, we have not only introduced the use of smellsticks in the future scenario to alleviate feelings of homesickness, but also how the excessive use of smellsticks to escape reality could lead to addiction. Sticking to the perceptual bridge linking the use of smartphones to the use of smellstick technology, this is based on trends in the data corpus, where participants indicated not using smartphones to take pictures or videos as this would "break" the flow of their experience. Including potential positive and negative implications of this speculative smell technology creates an ambiguity around the desirability of this future scenario, enabling this Speculative Design Fiction to act as a conversation piece leading to discussion.

3.3 From Future Scenario to Short Film

With the framework for the future scenario created, informed by trends and themes identified in the data corpus, the perceptual bridge has been crafted linking the familiar present with the unfamiliar future. The provocation to engage audiences and provoke an emotional response has been created and the next step is to decide the specific form this Speculative Design Fiction should take. Several different formats were considered, such as a perfume line based on the smells in a city captured using smellsticks or creating a prototype of a speculative interactive smellstick device. However, inspired by the success of the Netflix series Black Mirror and to be able to communicate the main findings of this research to non-experts for further speculation and discussion, it has taken the form of a short film as this is an easily accessible format.

First, based on the future scenario, a script was written by the researcher based on the stories of participants during the Walking & Talking phase. These stories were used to inspire the characters and events in the script, adding details and depth based on science fact. For the creation of the short film, the researcher collaborated with a small team of digital media students experienced in directing, filming, sound design and VFX design. For each of the key scenes in the future scenario, the researcher and digital media students created a storyboard as a graphic representation of how the short film would unfold to communicate the specific trends and themes in the data corpus that should be visualized and represented in each of the scenes (Figure 4).

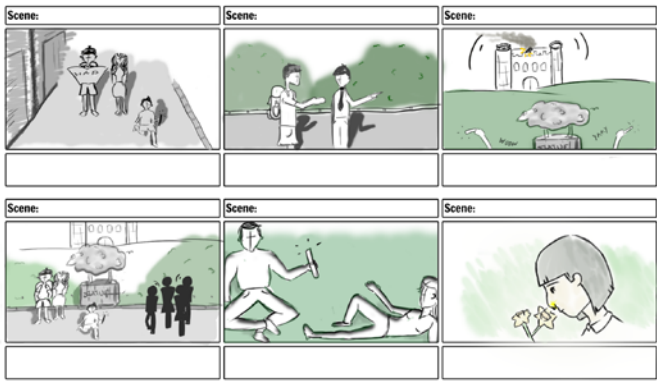

Figure 4: Part of the storyboard for the creation of the Speculative Design Fiction in the form of a short film. © Shenando Stals

To help bring the story to life and speculate about social practices that may be constructed around and through this speculative smell technology, diegetic prototypes of an interactive "smellstick" device and disposable smellsticks were designed as artefacts and props for the short film (Figure 5). Following the established perceptual link between smartphone use and smellstick use, the interactive smellstick device is the same size as a smartphone and will be used to replace smartphones in the future scenario depicted in the short film. Just as smartphones are widely owned and used to capture, watch and share pictures and videos in the present, the interactive smellstick device are widely owned and used in the future scenario to capture new smells and consume and share already collected smells. Besides the interactive smellstick device, there are also diegetic prototypes in the form of disposable smellsticks which can be used to consume or share one specific smell related to one specific place, time or event in the past. This represents the trend in the data corpus that smells are often linked to the experience of another place or to a specific time, season or event in the past. For example, in Figure 5, one disposable smellstick holds the smell of the beach in Thessaloniki in Greece, while the other smellstick holds the smell of Christmas 1987. These two examples are informed by stories in the data corpus, however, what the specific smell of the beach in Thessaloniki and of Christmas 1987 might be is up for discussion.

Based on the future scenario, the diegetic prototypes and the storyboard informed by the data corpus, the Speculative Design Fiction in the form of a Black Mirror-style short film called "Smellification" has been created in collaboration with three digital media students and eight actors. This short film appropriates standard Hollywood techniques which have previously been used to make Speculative Design Fictions more convincing [51].

Figure 5 - Diegetic prototypes of an interactive "smellstick" device, and two disposable smellsticks labelled "Greece/Beach" and "Christmas 1987", used as props for the short film. © Shenando Stals

The 3-Act story structure is used which consists of the following key scenes: the opening scene (setup), the middle scene (confrontation) and the end scene (resolution).

Figure 6 – Opening scene: Creating the perceptual bridge, by linking use of unfamiliar, future smellstick technology to the familiar, current use of smartphones. © Shenando Stals

In the opening scene depicted in Figure 6, a family of tourists uses their interactive smellstick devices to capture their experience of their summer holiday in Edinburgh. This scene establishes the perceptual bridge, linking the familiar use of smartphones to take pictures and videos of one's holiday location, to the unfamiliar future smellstick technology used to capture smells of the holiday location. This scene shows the family trying to capture the gunpowder smells related to the ceremonial firing of a canon at Edinburg Castle, as the smoke descents on the city below.

The middle scene depicts a group of student characters consisting of two local students from Edinburgh and two exchange students from Greece, who sit down in the grass to hang out and relax. The two Greek exchange students try to alleviate their feelings of homesickness by consuming and sharing the smell of the Greek beach in their hometown of Thessaloniki using a disposable smellstick, evoking strong emotions of ecstasy and relaxation which causes them to zone out. This disposable smellstick is passed around the group in a similar way that the data corpus revealed participants would pass around a cigarette or joint, while relaxing in the park with a group of friends (Figure 7). The other Greek student and one of the local students decide to partake and quickly zone out as well. However, one local student kindly refuses as she prefers to stay in the moment and decides to capture the smells of daffodils nearby, so that she can use this smell to enhance her experience of the park on a rainy day.

Figure 7 – Middle scene: Greek and local students share a disposable smellstick containing the smell of the beach in Thessaloniki (Greece) used by the Greek exchange students to alleviate feelings of homesickness. © Shenando Stals

The middle scene explores the trends identified in the data corpus, that certain smells are linked to the same place at a certain moment in time (e.g. a season), while others smells are linked to the experience of another place (e.g. the beach in Greece). It aims to raise a discussion around what other smells might be connected to the experience of urban places, what the technology and process for capturing, consuming and sharing the experience of place using smells might look like, and the potential implications of such technology on our relationship with place.

In the closing scene, which takes place a few months later, we again see the local student who uses the captured smell of daffodils during the summer day to enhance her experience of walking the dog in the same park on a rainy autumn night. As she walks through the park, she encounters a homeless "smell addict" lying on the ground. He is taking a sniff of a disposable smellstick labelled "Christmas 1987", attempting to escape the harsh reality of life on the streets (Figure 8). On the ground lies a newspaper with the headline: "SMELLSTICK ADDICTION ON THE RISE, NATIONAL HEALTH SERVICE ISSUES WARNING!" This end scene uses the tactic of provoking ambiguity of relationship, to explore the potential undesirable elements of the speculative smellstick technology, by raising concerns regarding potential health issues related to smellstick use, such as addiction.

Figure 8 – Closing scene: Addicted homeless man uses a disposable smellstick with the smell of "Christmas 1987" to escape the harsh reality of life on the streets. © Shenando Stals

4 Conclusions and Future Work

This paper presents research in the field of Urban Interaction Design, which takes a human-centred design approach to investigate how people's emotional relationship with places in the urban environment that are meaningful to them on a personal level, could potentially inform the design of new technological devices and services. A Speculative Design approach is taken where the data corpus gathered using the ethnographically-informed Walking & Talking method is used to inform the creation of Speculative Design Fictions. These Speculative Design Fictions speculate about what creating, capturing, collecting, representing, consuming and sharing emotional person-place relationships mediated by innovative technology might look like in smart cities of the (near) future.

The main contribution of this paper is building outwards from a sophisticated understanding of the approach, using several design techniques to create the crucial link between between trends and themes in an ethnographically-gathered qualitative data corpus, and the design and creation of Speculative Design Fictions. The case study presented in this paper describes the process of designing and creating a Speculative Design Fiction which uses speculative "smellstick" technology to capture, represent, consume and share personal relationships with urban places using smells. It describes the step-by-step process starting with the gathering of ethnographic data to inform the design of the Speculative Design Fiction, to the use of design techniques such as Tactics for Ambiguity, PACT-analysis and the SCAMPER-technique to design and create the speculative future scenario, to the articulation of this Speculative Design Fiction in the form of a short film.

The next step in this research will be to conduct a series of focus groups where the suite of Speculative Design Fictions, including the short film, will be used as conversation pieces to engage non-experts and members of the general public in a

discussion around what the implications of such innovative technology might be for our experience of and relationship with urban places.

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