In Support of City Exploration
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ABSTRACT
The novel experience Anywhere allowed participants to explore an urban area, tying together information not normally available, new points of views and interaction embedded into physical places. Guided by ‘unseen’, on-the-street performers in an ongoing conversation maintained over mobile phones, they gained access to locative media and staged performances. Our analysis demonstrates how Anywhere produced engaging and uniquely personalised paths through a complex landscape of content, negotiated by the performer-participant pair around various conflicting constraints. We reflect our analysis through the lens of the key characteristics exhibited by mechanisms that support city exploration, before focussing on possible extensions to the technological support of teams of professional and amateur guides.

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Locative experiences, city guide, performance

ACM Classification Keywords
H.5.3 Information Interfaces and Presentation (e.g., HCI): Group and Organization Interfaces: Collaborative Computing.

INTRODUCTION
Exploring and understanding the city is an intriguing and rewarding experience for visitors and residents alike. Visitors seek out unfamiliar places; they look to understand a city’s history or find parts of the city associated with particular people or events. In doing so, they draw upon a host of information to support these activities. ‘Official’ content is provided by the city or authorities that is well researched and documented, and often sanctioned to provide a particular view on an environment. This is often supplemented by a growing raft of user-generated, frequently geo-tagged information such as tips and tricks, user generated reviews of restaurants and hotels as well as guides to the less well-visited quarters, normally considered ‘inaccessible’ to the tourist. In addition, the various stories associated with the city and its inhabitants, both factual and fictional, offer different perspectives on the same urban space. Overall, the above and the experiences and reactions of other visitors are often what make the experience of visiting a city memorable. Visitors also come across real challenges. Resources are often tied to particular locations dispersed throughout the city, some of which are not easily accessible. Moreover, the locations are shared, potentially requiring visitors to contend with others in order to undertake activities at a particular time and location.

To enhance their experience of the city and to make the city more legible to them, visitors routinely turn to some form of guide. Two distinct strategies are used to improve access to the city: human guides and guide technologies.

Human guides vary considerably in their knowledge and their relationship to the visitor. This could be a friend, longstanding or newly found, spontaneously or through a community based travel site [12]. It could also be a professional guide, trained to frame experiences in a particular way, matching the visitors’ preferences to their knowledge. In both cases, visitors will enjoy real personal engagement and may well see places that are not in guide-books, allowing access to the (otherwise) inaccessible.

The simplest guide technologies used by people exploring a city are paper-based guide books and maps. They also offer adaptability in the way that they allow visitors to choose what they like to see and can provide in-depth information on particular subjects to allow informed decisions to be made. Audio guides, often using codes corresponding to locations, offer similar flexibility [14]. Positioning technologies (e.g. GPS, WIFI, RFID tagging) in combination with wireless networking have allowed the development of location based services (LBS) such as tourist guides [1,10]. By combining the preferences of the visitor, the experiences recorded by other visitors, and their location, recommender systems [4] are able to offer suggestions and support the visitors’ navigation as they traverse the city. Finally, guide technologies may also present dynamic information, e.g. opening hours and special events. Much more structured physical guidance and narrative (with correspondingly reduced risk and effort) can be expected from scripted, linear audio and video tours that take people on a defined path [9,16].
The growing number of freely-available authoring tools [13,18] and the increasing number of mobile phones with GPS, have made structured experiences easily producible, encouraging a broad set of researchers to start exploring new forms of user experience that enhance city visiting.

Arguably, city-based locative experiences such as those cited above have been limited to focussing on one or several, but not all of the characteristics desirable for city exploration that we have highlighted (i.e. personal engagement, adaptability, support for navigation, representation of dynamic information and access to the inaccessible). A limiting factor in the case of guide technologies is the lack of a human’s adaptable decision-making (thus often overloading the user with information to compensate) and the ability to personally engage; on the other hand the advantages of human guides on these issues also diminish significantly when they attempt to cater for multiple visitors simultaneously, and knowledgeable human guides are a limited commodity, thus scalability is a fundamental issue. In what follows, we put forward our reflection on Anywhere, to explore the range of possibilities that emerge when human- and technologically-assisted approaches to city exploration are combined.

ANYWHERE

Anywhere was developed in collaboration between choreographer Willi Dorner and the Mixed Reality Lab, drawing on experiences gathered during a previous collaborative project [16]. Working with a professional artist allowed the production of a novel compelling experience, an approach which has previously proved very fruitful [5,6]. Anywhere aimed to encourage participants to explore hidden places and untold stories, and reflect on the nature of city exploration itself while receiving the benefits of close personal contact with a guiding companion. It involved location-based activities spread across multiple locations in the city exploiting media designed to be displayed on mobile phones, puzzles and challenges, access to a cave and elements of live performance.

At its core, the experience relied on human ‘doubles’: performers whose job it was to follow, observe and communicate with participants in order to choose and schedule appropriate location-based activities, guide the participants to the appropriate locations, and help them trigger those activities, while remaining unseen.

Design

Anywhere was hosted by Nottingham’s Broadway cinema and media centre, which provided facilities for the event’s start-point, front-of-house staff and organisers. The event lasted four days, with around 10 participants per day experiencing a tour. Each participant was assigned a dedicated performer (their ‘double’) for their tour (lasting approximately an hour). The close contact with the double allowed the visitor to be supported during navigation and to be helped when unexpected events occurred.

Up to three participant-double pairs would tour concurrently, starting their tours in a staggered manner in order to avoid clashes at fixed points such as the start and end. Each experience followed a general, flexible structure:

- A short briefing introduced the experience;
- Participants were guided (by the double who remained hidden from them) across the city in order to encounter a selection of locative experiences designed to exploit particular aspects of the urban environment;
- At the end of the experience the participant would return to the starting point either on foot or by tandem.

The various stages of Anywhere are explained in detail from the participant's perspective in the following sections.

Briefing

Every participant’s experience began with a short briefing session during which several forms of the participant’s private information were processed. Aside from requesting a security deposit for the equipment used during the experience, photographs of participants were taken. Having been processed, participants were instructed by front-of-house staff on the basic usage of the mobile phone on which the tour software was deployed. In a nutshell, participant-double pairs were equipped with paired Nokia 6680 mobile phones. Participants wore a headset to access audio content and phone calls from the double. The phones used a commercial 3G network for voice communication and data exchange via an event web server. Throughout the briefing, the double remained hidden from the participant, although they accompanied them throughout.

Making Contact

The tour begins with a video on the participant’s mobile device. A voice-over prompts participants to follow the video and so begin their own walk through the city, reflecting on the nature of cities in general and where they might head if they were a tourist.

![Figure 1. Double recording video of participant](image)

While the participant is wandering the streets, their double follows and takes advantage of an opportunity to get close and create a short video of the participant without them knowing, as shown in Figure 1. This video taken by the double is uploaded automatically to the server. The double retreats to a safe distance, but continues to follow the
participant throughout the entire event. The participant’s mobile retrieves the video created by the double and this is appended to the one currently being watched, so that the participant becomes the subject of the clip in its final moments, as shown in Figure 2. When the double deems that the time is suitable, they initiate a phone-call to their participant and greet them. While the previous video may have led the participant to suspect that they are being observed, this intervention is the moment that the participant becomes aware that it is another person that is accompanying them on their tour, and it is the first occasion on which the double offers the participant a choice of one of the locative experiences.

**Locative Media and Experiences**
Core to Anywhere are 14 locative experiences. These all make reference to the physical environment and frequently challenged participants to look at the city from new and unusual perspectives. The types of experience are summarised below (the number of each is in brackets).

- **Text trails (2)** involved textual puzzles making use of clues in the environment to move participants along a predefined path. These frequently challenged people to step outside the frame of behaviour typically seen in public space.

- **Face trails (2)** displayed images of faces found in the environment (advertisements, shop windows, etc.) on the mobile device. Searching and finding these faces moved participants along a particular path. At a certain point in each trail, the participant’s phone secretly takes a photograph of its user; this photo is then later inserted into the sequence of faces in the environment as shown (on the right) in Figure 4.

**Figure 2. Video received by participant**

**Videos (5)** provided location based views into otherwise inaccessible spaces and experiences. This included material on a disused tunnel under the city and a city quarter that has since been demolished.

**Reflections (2)** simply provided space and time for participants to reflect, lying on a mattress in a public but relatively secluded space. This was supported by associated audio material played through the mobile.

**The cave (1)** gave access to a cave under one of the city’s fashion stores, with time to explore the space.

**Performances (2)** involved actors engaging with participants in staged experiences. The first mixed this with video presented on the mobile that the participant follows around the grounds of a church. At various points in the video they see a performer wearing the faces of different actors playing Robin Hood, who Nottingham is famous for. The same performer appears in reality at unexpected moments and imitates some of the same poses made in the video (see Figure 5, left). The second involved participants in a one-to-one dance performance in an apartment rented out for the event (Figure 5, right). It was designed to afford the participant a variety of unusual perspectives on the interior architecture.

**Figure 3. Text trail example and resulting physical action**

For example, once participants had been guided to a particular disused shop entrance they were prompted by the message shown in Figure 3 (left). This behaviour was clearly visible to bystanders. It also tied in digital media displayed on the phone and a particular location.

**Face trails (2)** displayed images of faces found in the environment (advertisements, shop windows, etc.) on the mobile device. Searching and finding these faces moved participants along a particular path. At a certain point in each trail, the participant’s phone secretly takes a photograph of its user; this photo is then later inserted into the sequence of faces in the environment as shown (on the right) in Figure 4.

**Figure 4. Face in shop front and secret photo**

Each Anywhere experience would involve a selection from these 14 experiences. Our system logs indicate that a tour would most commonly include 3 experiences taken from the choice of 14 overall. This number varied, ranging from 2 to 6 depending upon the time spent at locations, the distances between chosen locations (the ‘link’), and the speed of link traversal. Some would be delivered at
particular fixed points (where exploration was sometimes encouraged, e.g. the cave), some along paths (which made those experiences part of the navigation of the city itself).

Following the final experience, participants were offered the choice to either walk or take a tandem bike ride back to the start-point of the tour.

The Role of the Double
The double was central to making Anywhere work as an experience. Their task was to guide the participant through the city-centre to reach the locations to which each experience was anchored. They would achieve this by making a number of phone calls to the participant to provide verbal directions, while remaining hidden from view throughout. Depending upon the familiarity of the participant with the city, these directions varied from briefly stating the destination to step-by-step instructions all the way to the chosen location. In many cases, as we will show later, guiding participants frequently turned into accompanying them, and the building-up of an ongoing conversation, used for re-assurance, ‘quality control’ and trouble shooting.

Doubles essentially acted as remote guides for participants. Direct communication between double and participant was almost entirely one-way: doubles could call their participant and send media to them; participants on the other hand had no means of initiating a phone-call and could only generate media to document their tour (this media was stored on the event web-server, not sent to the doubles). The only channel through which a participant could contact their double was via a set of predefined text messages selected from an on-screen menu.

Once a location had been reached, the double initiated a further phone call to prepare the participant to begin the experience. 12 experiences utilised the participant's mobile and the mobile content needed to be triggered by entering numerical codes into the mobile client. The doubles revealed relevant codes to the participants during this phone-call and would give any additional instructions necessary for the experience before hanging-up and leaving the participant to trigger the experience.

Once the double had observed that their participant had completed an experience they would phone the participant, discuss the experience and then offer a new choice. The process of choosing a location, navigating the link to that location, and then engaging in that location’s experience was repeated for the participant until the duration of the tour neared the advertised length of an hour.

In the following sections we present our analysis of this experience revealing how doubles dynamically composed journeys through the landscape of locative media and performances, scheduled key events and undertook a broad range of guiding activities for visitors.

METHOD AND INITIAL FEEDBACK
Our evaluation draws on a variety of sources of data gathered from the staging of this event. One participant-double pair was filmed. Their phone conversation and that of one other pair were recorded. The web-server logged all texts sent, reservations made and media produced by either double or participant, in addition to the times at which phone calls were made. To expose opinions and learn more about the behaviour we had observed, a series of informal and opportunistic interviews were conducted with doubles and participants, occasionally bringing the two together. Two doubles returned a set of notes concerning their experiences. Finally, all participants were offered the chance to comment on their experience via questionnaires that covered the overall event, but focused on the participant-double relationship.

Participant profile
Over four days, Anywhere was experienced by 40 participants, none of whom were involved with the production of the piece. Participants learnt about the event via various forms of advertising in relevant media. From the 39 completed questionnaires, it is clear that approximately two thirds of participants were female and one third was male. Around 40% were under 25 years old, 40% were between 26 and 40, 20% 41-60, with 1 person being over 60. As can be expected with an event like this, a large proportion of the audience were students, academics and professionals with a background in the creative industries ranging from Fine Arts to Digital Media. More than 90% were familiar with the event city, clearly an important factor in a location-based experience. Familiarity with mobile technology was also very high, with only two people not owning a mobile phone and more than 50% using their phone for things other than talking and texting, such as browsing the web, playing games, as an organiser and for checking and sending email.

Overall feedback
There was a general consensus (Fleiss' Kappa 0.68) amongst the participants that they very much enjoyed Anywhere (based on 34 Likert-scaled responses) and this was backed up by enthusiastic comments such as “A real life adventure – I loved it”, and “really enjoyed finding hidden sides of the city and being surprised”. In a single exception to this trend, one participant did not find the participant-double relationship comfortable and strongly disliked the artistic content of the experience, but unfortunately did not provide us with a completed questionnaire. The technical problems that we did have during this prototype event were woven into the piece through contingency design and by the doubles' performance and participants agreed that their device was reliable (35 responses, tending towards “agree” on a Likert scale) and disagreed that it was difficult to use (34 responses tending towards “disagree”).
DOUBLE – PARTICIPANT RELATIONSHIP

The double-participant relationship is at the core of Anywhere. In the rest of this paper we will focus on this relationship and how it shaped the experience of participants, using data from all relevant data sources mentioned previously. All participants have been anonymised to “P” and the three doubles to “D1”, “D2” and “D3” respectively.

Briefing and Making Contact

After the initial briefing, a participant, “P”, leaves the Broadway cinema and watches the introductory and the ‘making contact’ video. Once the system has alerted double “D1” that P has finished watching the videos, the double calls P. Every participant wears a hands-free kit to listen to the media on their mobile, and each mobile is set-up to answer incoming calls automatically, thus P is unexpectedly dropped in to a conversation. This initial conversation is transcribed in what follows.

D1: Hello
P: [pause] Hello
D1: I have been watching you ...
[P is laughing, surprised]
D1: ... and I decided that I will just join you for the rest of the walk
P: OK [laughs]
D1: OK … Are you from Nottingham?
P: Ah … yes
D1: So you know your way around pretty well?
P: Yes

This initial communication serves to introduce the double to the participant and begins to establish the quality of their relationship. It is clear that P is very much surprised by this unannounced contact. Our questionnaire results confirm that this was the case for the majority of participants. The double is clearly in control, with P not even having a chance not to answer. D1 then proceeds to establish how much guidance P might need during the experience by asking her about her familiarity with the event city.

Choosing what to do

Every participant’s experience of Anywhere is constructed on the fly, with both the double and participant contributing to the choice of the constituent locative experiences.

Double’s Considerations

From the set of all locative experiences, the double chose a subset that they considered suitable in the current context, then decided, in conversation with the participant, which one of those to experience next. The following examples show that doubles considered the proximity of experiences in deciding which experiences were suitable and also had their own general preferences regarding the value and suitability of particular experiences.

At any time, a participant would be close to some potential experiences and far from others. D1 stated in his notes that he did judge experiences as unsuitable based on the fact that particular participants might take a long time to reach them. There is evidence, however, that in some cases doubles decided that while experiences may be distant, they would also be especially enjoyable to the participant and so still offered them. In an interview, D2 stated that she had rushed a particular participant because “... I wanted her to experience lots of things; I only had 10 minutes left and I wanted her to do Robin Hood [a performance].” D3 added that she sometimes told participants near the end of Anywhere: “I want you to have one more experience but you’ll have to rush because someone’s expecting you, the door’s closing, he’s about to leave.” Sometimes, the urge to show participants a greater number of experiences led to some frustration. In their questionnaires, one participant stated: “[I] didn’t like having to run though. Why did I need to go fast?”

At the same time, the pace of parts of the event – especially during certain experiences when participants were not in communication with their double – could not be controlled. In one instance, a participant took almost 40 minutes to complete a text-trail, using her mobile client’s “take a photo” function to document the places she was exploring. As a result, this participant could only be given this and one other experience before returning to the start.

As a further complication, doubles needed to consider the concurrent actions of other double-participant pairs in the city. Generally speaking, the locative content could not be experienced by multiple pairs simultaneously, thus doubles referred to their mobile client which showed the status of each experience at that particular moment.

An example is shown in Figure 6 where ‘Atlas exp’ has been reserved by this double for the last 20 seconds, and ‘Cottage’ has been reserved by another double for the last 55 seconds. A ‘reserved’ status would indicate that an experience is unsuitable as another double-participant pair could be engaged at that location. Logs demonstrate that from the 40 participants only two appeared to follow the same overall path (i.e. the same experiences in the same order). The importance of dynamic context in determining suitability would suggest that there was little opportunity...
for doubles to consider and plan an overall trajectory. The log data supports this and D₁ stated in his notes:

*Each visitor experience was totally improvised. It felt really unstable, many ‘unknowns’. My decisions were based on what other shadows were doing, where the visitor walked, length of each station, the feeling assessed by watching the visitor what they could comprehend and handle. No plan could be made before we started.*

However, looking at the log data in more detail reveals that certain stations were visited more than others: the five most popular experiences had around 20 visits each; 16 of the 40 participants started with the same text trail and one of the face trails was visited 10 times in comparison to the other’s 2 times. Arguably, this can be attributed to how these were laid out, but D₁ also stated that he discounted experiences where he had experienced technical difficulties previously and that he preferred those that offered good hiding places near by. In an interview of all three doubles, it transpired that none of them liked the Reflections experiences and the log data shows that these experiences were only offered to and experienced by 3 participants in total. As such, personal preference on behalf of the double was clearly an influential factor when deciding which experiences to offer.

**Discussing what to do**

With the two most suitable experiences in mind, D₁ makes contact with participant P, and offers a choice of these two.

D₁: *Would you like to listen to something in the city?*

P: *Yeah*

D₁: *... or go under ground and find something historic?*

P: *I wanna go underground*

D₁: *OK ... I need you to walk back down Pilcher Gate towards the tram tracks*

P: *OK*

While the process of offering choices is very friendly, the instructions that follow are assertive. These instructions are also very precise, while the descriptions of the experiences offered by the double beforehand are very vague, leaving P to use her imagination to make a choice, maintaining a level of mystery about the experiences themselves.

**Reservations**

Having decided with their participant on one experience, doubles could update the reservation status of this experience to ensure that other doubles did not consider the experience suitable. To enable this process their mobile phone client allowed them to reserve experiences, updating the public status of the experience to ‘reserved’ for all doubles to see and thus incorporate into their suitability considerations.

Approximately 60% of all experiences were reserved by their doubles via their mobile client. The doubles’ notes provide insight into why the remaining 40% of experiences were not reserved: D₁ states that some experiences (e.g. the text and photo trails) could support concurrent participants. When a participant-double pair was already engaged with one of those, the second double could not reserve the experience because it was already reserved by the first. D₁ and D₂ state that they would often not reserve a location if they felt that there was little chance of other doubles trying to visit it: D₁ says that if he saw D₂’s visitor heading away from the cave, and knew that D₂’s tour was almost over, he would not need to reserve the cave for his visitor.

Despite the regular use of the interface, the following excerpt illustrates the work that needed to be performed around it. The tandem ride at the end of Anywhere was an important but limited resource. Its scheduling needed to be considered well in advance to ensure availability at the right moment in the experience. D₁’s participant had already spent 50 minutes on tour and so he decided that the next experience would be the last one, only followed by the tandem ride. D₁ calls the rider (their audio is not available).

D₁: *I am coming with someone else. Are you still doing [D₁]?*

Tandem-rider: *[inaudible]*

D₁: *OK, so I reserve. She’s [P] probably there now [at next experience]. I have to give her the instructions.*

D₁ uses the conversation to inquire about future availability of the tandem at the anticipated time of P coming out of her final experience. This inquiry occurs more than 10 minutes before the tandem-rider is actually required as shown in the following excerpt from a second call to the tandem rider.

D₁: *She is waiting in front of St. Peter’s church ... you can go straight there ... she has a pink coat on*

Tandem-rider: *[inaudible]*

D₁: *yeah a pink coat ... bye*

P accepts the rider’s offer of a ride to the starting point, while D₁ walks back to prepare for his next tour.

**Accessing Locative Experiences and Media**

In what follows, discussion turns to the process of guiding the participant to the chosen locative experience and starting that experience once its location is reached.

**Guiding**

Once choices had been made, it was the double’s job to get people to the starting points of the various experiences.

D₁: *I’d like to show you some more details that you might not be so familiar with*

P: *OK [laughs]*

D₁: *Do you know where they sell fruit and flowers in front of the Zara?*

P: *Yeah*

D₁: *... on the little square?*

P: *Yeah*

D₁: *... when you get there, I'll call you back*

In some contrast to previous excerpts, the instruction here is much less descriptive as the participant is familiar with the destination. It is also clear how features of the shared physical environments are drawn in to the instruction. In addition to stationary features, people and events in the
immediate context are made use of, e.g. in an interview, D₂ mentions that she occasionally asks participants to follow conspicuous bystanders, whose appearance she then needs to describe in some detail. However, as such moments are only fleeting it is sometimes difficult to take advantage of them unless double and participant are already engaged in a phone-call.

Starting an experience

For the 12 locative experiences (out of 14) that included media presented on the mobile device, a code had to be entered to access that media. The following transcription illustrates the introduction and hand-over of the experience code by double D₁ to participant P once D₁ sees that P is in the correct location.

P: Hello
D₁: You are going to go on a journey, following some instructions on your phone
P: OK
D₁: It starts in that square ... and I need you to put a code in the phone ... to receive the instructions
P: OK
D₁: The code is “9999”
P: Shall I do it now?
D₁: Yeah and then you press the button “try code” on the right ... and I’ll join you at the end

D₁ keeps this interchange brief, allowing P to return her focus to her mobile and enter the code while it is fresh in her memory. In this case “9999” triggers one of the two text-trails, displaying the first text clue on her mobile. Anywhere’s locative mechanism was extremely simple: the doubles’ human judgement is used in lieu of positioning technology to decide when to trigger content that was previously decided on. Although this mechanism afforded participants the chance to guess codes (26 participants tried) none of those attempts were successful

During experiences

We now discuss what happened during experiences, focusing on the sharing of experiences, crossing boundaries and providing re-assurance.

Sharing an experience

The text-trail experiences offered doubles the chance to get very close to their participant, capture them in media, and then send that media back to the participant. During a text trail, D₁ approaches participant P and uses his mobile to photograph P. Certain text clues force P to concentrate hard on the task at hand, making this intimacy possible. When the photo is received shortly afterwards, it serves as a brief reminder of the closeness of their personal double (see Figures 3 and 7 for examples).

Figure 7. P’s screen displaying the photo of P taken by D₁

An aspect of Anywhere that was unintended but emerged over time was the sharing of locative experiences between double and participant through phone-calls during the locative experiences. Through interviews we found that doubles varied in their willingness to intervene in this way: D₁ states that she often “feels an urge to contact”, but always waits until the experience is over. D₂ explains that some participants spent exceptional amounts of time at experiences where they were hidden (e.g. the cave) so she needed to call to see if they were OK. D₁ adds that he called one participant by mistake, but since both he and the participant enjoyed sharing that experience, he continued to do the same for several later participants. He comments in his notes:

[The time during experiences is required] to plan and pay attention to reservations and hide from the public. The last days, I started calling them when they were in the middle of something so we could do it together and it seemed ok with them.

The following transcript, taken from D₁’s conversation with P during one of the text-trails illustrates this sharing:

D₁: Are you raising your arms and looking in the mirror?
P: Yeah
D₁: Really?
P: Yeah
D₁: Ok, I am doing it with you
P: Laughing
D₁: But people aren’t looking at me as weird

Sharing experiences also included offering reassurance as part of relationship building. In an interview, D₂ relates a discussion with a participant during their experience of one of the text-trails. She says that she was concerned about whether visitors would follow the trail down a back alley and that she thought this participant would be particularly unwilling, so she tried to be more reassuring, saying: "I know it’s a bit grim but go down to the end and it’ll get better on the other side of the door". In addition, transcripts of event audio reveal that reasons for intervention during an experience occasionally extended beyond reassurance into problem-solving. During a participant’s mixed reality performance experience D₁ noticed that the participant did not appear to be following the video as expected; he calls to see what has happened.

D₁: Did you manage to spot the real Robin Hood a few times?
P: I did [laughing]
D1: Are you still on the video trail?
P: Yeah, but I think I have got lost.
D1: It’s still playing?
P: Yeah but I have got lost. On the video there is people walking along a ... a railing ... but I can’t work out where the railing is.
D1: Yeah, it’s back on the side of the church near the street
P: Ohhhh ... Oh yeah yeah, I can see it now ... I can see another Robin Hood as well
D1: [inaudible] you are following it very well

The phone-calls to participants after an experience often included reassurance to show both that the double had been watching, and to let the participants know that they had completed the experience successfully. The transcript that follows illustrates the start of a typical post-experience phone-call:

P: Hello
D1: How was that for you?
P: Yeah, it was really good (laughing)
D1: You follow instructions very well
P: Laughter
D1: I am impressed ... with your attention to detail

In his notes, D1 recalls that some experiences and participants warranted more discussion than others:

I was intuitively listening to their voice or body language to figure out if they wanted/needed to talk or let those stations stand by themselves.

Breaking boundaries

It was clear that on occasion participants broke the boundaries of the performance frame, a situation previously observed with other experiences [5]. Official access to the cave from the city streets occurred via one door, monitored by volunteers. There was, however, a further exit from the lower level of the cave into outdoor storage space. While this exit was barred, there were a number of instances where participants appeared to treat this as an obstacle to be overcome within the frame of the experience, and doubles could not see the participants in order to prevent them from trying to achieve this. Audio from one tour reveals the participant talking to the tandem-rider about how she went through this exit even though she wasn’t sure whether she was supposed to. Another participant explained that he really liked the ‘challenge’ of it and yet another stated that she felt like ‘Alice in Wonderland’ when she broke through the exit and that she wanted to keep exploring:

I walked out into the garden behind and ... found the air-conditioners, and then I went right to the corner and couldn’t go any further ... I did find another door but it didn’t open; I did try to open it: I shinned up the wall to the ladder, there was another cave that I could see, and so I wanted to go in that cave.

Crossing the boundaries of the experience frame in such a way clearly disconnected participants from their doubles in a way that made it difficult to continue their support. In some cases, other Anywhere staff were involved to find participants and bring their experience back on track.

SUPPORTING CITY EXPLORATION

In our original concept of Anywhere, the double's role was intended as both low-tech 'guidance system' and support, but the double developed to take on much more responsibility. Due to their work, illustrated by the data excerpts in the previous section, participants did not perceive a string of disconnected pieces of content delivered in the most efficient way but were engaged in an on-going experience and conversation taking in their personality and preferences, the environment and bystanders, in addition to the designed media and performances. In what follows, we discuss how Anywhere relates to the key characteristics of city exploration mechanisms that were briefly highlighted through related work in our introduction. We use these as a framework for discussion and the presentation of our analysis.

Personal engagement: Participants in Anywhere felt accompanied by their doubles in that they provided a friendly voice, information, comfort and re-assurance. The doubles and participants held an ongoing conversation while navigating and before, during and after experiences. While fully remote co-visiting mechanisms can provide aspects of this type of personally-engaging conversation [5,8], a degree of reassurance is achieved by the doubles in Anywhere by their ability to refer to features and events that both they and their participant could see. This reminded participants that they really were close, even though they were hidden from view.

Adaptability: Overall, the experience was adaptable on-the-fly, responding to actions of participants, other doubles and changes in the environment. Doubles could alter the pace and structure of the tour to match the participants' physical capabilities and their preferences, going much beyond what is possible through the collection of user preference data in automated systems. They then provided just the right level of navigational information, and reacted to any unexpected participant behaviour. Doubles also needed to react to other double-participant pairs. Use of the reservation interface, phone calls to other performers, visual observation, the use of alternative 'buffer' experiences and a rapidly developing knowledge of each others' behaviour and preferences allowed doubles to ensure that experience resources were never contended for. Finally, doubles needed to react to the environment and circumstances. Through the development and sharing of information about the environment, and an ability to improvise the doubles could alter the structure of the tour at different times of day (e.g. respecting closing times), react to or avoid malicious interventions by bystanders, and weave technical problems into the experience.

Support for navigation: As the double in Anywhere was not in the participant's sight, navigation was a non-trivial issue, but was supported effectively by verbal instructions via phone-calls. Key to the success of this method was the close proximity of the double which allowed them to refer
to features of the environment shared with their participant as navigational clues. As these instructions were constructed on-the-fly, doubles could tailor them to participants' actions, allowing for easy adaptation to routes. This created an experience that was different - more fluid - than experiences based on recommender systems [7]. As this was achieved through an ongoing personal engagement, access to information and narrative did not only occur at dedicated locations but it continued during navigation of the space between locations.

**Representation of dynamic information:** Knowledge of relevant city-wide contextual information beyond personal location, e.g. the number of tourists at different locations, site opening-hours and unexpected closures, and access to like-minded tourists can be very useful for the city explorer. Anywhere provided human doubles with a simple representation of dynamic context via the reservation interface. This representation allowed the doubles to discern the behaviour of the other double-participant pairs, yet doubles also relied upon phone-calls to other team-memembers on-the-ground at experience locations and the constant sharing of information amongst the doubles about unexpected changes to the environment. As such, relatively little contextual information was represented to the doubles, yet this information was enough to allow important judgments to be made about how the doubles structured their tours.

**Accessing the inaccessible:** The famous sights in a city are generally widely accessible to the public, but there are also many places of interest that are known only to a few locals, or that are secured from the public or have been forgotten. One of the most desirable traits of a local human guide is the ability to give the tourist access to these 'inaccessible' attractions. To provide this sense of exploration beyond the tourist trail we utilised a range of specialist local knowledge during the design and creation of Anywhere's content and experience. This lead to access to private and otherwise 'hidden' spaces and the experiences also encouraged participants to view their surroundings from abnormal perspectives, physically and temporally. In addition, doubles added artefacts (the printed photos taken during the briefing) and their own narrative to the environment, to create discoveries personal to individual participants.

**DISCUSSION**

We would argue that while existing mechanisms to support city exploration, ranging from tour guides to location based services, exhibit varying subsets of these characteristics, Anywhere was rather different in the way that it combined them to produce uniquely individual experiences of the city for each and every visitor. The feedback we collected demonstrated how engaging the resulting tours were and how much they allowed participants to see the city in a different light, providing a very different view from an ordinary tourist experience. This was achieved through the ongoing close collaboration between doubles and participants in choosing what to do, city navigation and actual shared experiences. This is in some contrast to exploring a city by using LBS. These typically allow a great level of independence, they may use broad repositories of user-generated content [11], and they may automatically recommend paths and sights based on preferences and past behaviour. On the other hand, electronic LBS in themselves do not engage the tourist personally, providing just the content and navigation, not an ongoing conversation, and do not account for contingency, in fact increasing the chance of contingency due to their users' reliance upon new technologies. Research is on-going to determine methods of navigation that promote a more reflective engagement with the surrounding environment, e.g. through the use of photo-trails or spatial audio [3,17]. In addition, collaboration has been explored in this context with an emphasis on the support of groups of users in shared museum visits [2,8] and shared visits to the city [7].

As the study of Anywhere has underlined, human guides can arguably offer very high levels of personal engagement. At the same time, an experience like Anywhere is clearly not scalable to more than a few visitors as professional guides looking after individuals or small groups are expensive [15]. In addition, there is a potential for mismatches in personality and taste between tour guide and tourist, the likelihood of which increases as the size of a tour group increases. It is in this overall context that Anywhere highlights the scope for developments in a different direction and we will briefly discuss the potential implications for the support of groups of human guides in the production of tailored experiences of a city environment to individuals or groups of visitors.

**Supporting professional guides:** Professional city guides have to work around other guides competing for the same resources. Guides also possess varying breadths and depths of knowledge. We suggest that technologies that provide guides access to dynamic information concerning the city and other guides (in the manner of Anywhere’s reservation mechanism) would be valuable. Useful information, such as the paths of other guides, the size of different groups, each guide’s areas of expertise, interests of the tourists, and the status of resources would allow guides to use each other’s expertise on the fly, either remotely or by reallocating tourists to different groups, and avoid congestion at sites.

**Supporting volunteer guides:** As mentioned in the introduction, there are also communities of volunteers who host and guide visitors through their city. The process of enlisting the support of a volunteer guide requires a greater degree of trust on behalf of the tourist. To support this process between what are initially groups of strangers we propose that volunteers would benefit from access to the same information that we suggested for professional guides. An automated solution might aggregate this information to recommend guides, matching their expertise and the visitors’ interests; it might also vet the different parties,
increase safety and allow hand-over of visitors from guide to guide, as volunteer guides may have a smaller area of expertise.

SUMMARY
We have presented the design and study of Anywhere, an experience in which individually assigned guides took visitors to a city on engaging and uniquely personalised paths through a complex landscape of media and performative experiences. Reflecting on the key characteristics of mechanisms to support city exploration, we have framed our discussion of Anywhere and shown how it provides a novel way of bringing personal engagement, adaptability, support for navigation, representation of dynamic information and access to the inaccessible together in one experience. We concluded with a discussion of how groups of human guides could be technologically supported to produce tours similar to those seen in Anywhere.

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