

Uncle Roy All Around You: mixing games and theatre on the city streets

**Martin Flintham,
Rob Anastasi, Steve
Benford, Adam
Drozd, James
Mathrick, Duncan
Rowland,**
Mixed Reality Laboratory
University of Nottingham
Nottingham, NG81BB, UK
{mdf, rma, sdb, asd, jym,
dar}@cs.nott.ac.uk

**Nick Tandavanitj,
Matt Adams, Ju
Row-Farr**
Blast Theory
Unit 43a
Regent Studios
8, Andrews Road
London E8 4QN
{nick, matt, ju}
@blasttheory.co.uk

**Amanda Oldroyd,
Jon Sutton**
BTexact
Adastral Park, Martlesham,
Ipswich IP5 3RE, UK
{amanda.oldroyd,
jon.sutton}@bt.com

ABSTRACT

We describe Uncle Roy All Around You, a mixture of game and theatre that took place in central London in late May and early June of 2003. Street players, equipped with handheld computers and wireless networking, journeyed through the streets of the city in search of an elusive character called Uncle Roy, while online players journeyed through a parallel 3D model of the city, were able to track their progress and could communicate with them in order to help or hinder them. We describe how Uncle Roy All Around You mixed elements of pre-programmed game content with live performance and behind the scenes orchestration to create a compelling experience, especially for street players. We suggest that finding ways to scale this approach to support larger numbers of participants is an important challenge for future research.

Keywords

Pervasive Games, Mixed Reality, Mobility, Theatre, Performance, Orchestration

INTRODUCTION

Pervasive games are a new form of entertainment played out on the city streets. Players equipped with handheld or wearable interfaces move through the city. Sensors capture information about their current context, including location, and this is used to deliver a gaming experience that changes according to where they are, what they are doing and potentially how they are feeling. In collaborative games this information is also transmitted to other players who may also be on the streets or on-line. The net result is a gaming experience that is interwoven with the player's everyday experience of the city.

The research literature contains several early examples of pervasive games including Pirates! [3], the AR Quake project [9] and MIND-WARPING [8]. In this paper we present and reflect on a further example called Uncle Roy All Around You. The defining characteristic of this game is the way it mixes preprogrammed game content with live performance that takes place on the city streets. It can therefore be considered to be both game and theatre.

Uncle Roy All Around you is the latest in a series of experimental works in which we have explored the boundary between multi-user games and theatre. These include Out of This World [6], Avatar Farm [4], Desert Rain [7] and Can You See Me Now? [5]. The latter was also a pervasive game in which up to fifteen online players were chased through a virtual model of a city by three performers (equipped with handheld computers, wireless networking and GPS receivers) who had to run through the actual city streets in order to catch them. Uncle Roy All Around You builds on this experience by placing the public on the streets as well as online and by adopting a less frenetic and more contemplative structure in which online and street players collaborate together on a mysterious journey across a city.

AN OVERVIEW OF UNCLE ROY ALL AROUND YOU

Uncle Roy All Around You is a experience that mixes street players, who journey through a city in search of an elusive character called Uncle Roy, with online players who journey through a parallel 3D model of the city, who are able to track their progress, can communicate with them, and can choose to help or hinder them. The game mixes programmed content with live performance with the intention of creating an engaging experience that is themed around the issue of trust in strangers. This paper describes the première performance of Uncle Roy All Around You which took place over two weeks in late May and early June 2003 in central London, based at the Institute of Contemporary Arts. We now provide an overview of the experience from the perspectives of street players and then online players.

A street player's experience of Uncle Roy All Around You

Street players purchase a ticket for a specific hour long slot (the number of simultaneous street players who can be in the game is limited to ten due to both technical and human resource limitations). On arrival at the venue they are asked to hand over all of their personal possessions including bags, wallets, mobile phones and keys, in exchange for a handheld computer. An actor then briefs them that their mission is to rendezvous with Uncle Roy and also explains how to use the interface on the handheld computer which takes the form of an interactive electronic map. They then head out into the city, cross a busy road and enter a park.

Their first task is to find a red marker on the map, to get to the physical location that it indicates, and then declare their position to Uncle Roy. In general, the street players are able to pan, zoom and rotate the map. Panning is achieved by dragging a 'me' icon that indicates their position across the map using a stylus, and declaring is achieved by using an 'I am here' button to send to current coordinates of this me icon to the game server. Whenever the street player declares their position to Uncle Roy they receive a text message from him in return. These messages are preprogrammed (Uncle Roy is not played by an actor).

Once the player has reached the marker, they move on to the second phase of the game in which Uncle Roy sends them a clues (in response to further declarations of position) that lead them through the park and into the narrow city streets in search of his office. Some of these clues are useful, but others are deliberately misleading or even mischievous (for example, at one point they are told to follow a tourist who is approaching them across a bridge; however, any such tourist is just a passing stranger who will lead them on a random chase for a while).

The street player may also receive messages from online players who appear to be following their progress and who send them text messages with advice, directions or otherwise. Some street players may appear to have access to further useful information, especially the location of Uncle Roy's office. In return, the street player is able to record and upload short (seven second) audio clips for the online players to listen to.

Eventually most street players find their way to a door where they are asked to press a buzzer. The door opens and they receive a message asking them to step inside. At this point their handheld computer swaps over to a pre-canned and timed sequence of instructions. They are invited into an empty office and asked to look around. They are asked to fill in a postcard, answering the question “when can you begin to trust a stranger?” After this, they are told to leave the office and wait in a telephone box just outside. The phone rings and on answering it, a human voice (an actor) tells them to walk around the corner and wait. Shortly after, a limousine pulls up and they are invited to step inside. Those who accept are taken on a ride through London, back to their starting point. On the way they are asked a sequence of questions about trust in strangers, culminating in them being told that somewhere else in the game another player is answering these same questions and being asked whether they are willing to enter a year long contract to help this stranger if ever called upon. If they accept, then they are asked for their address and phone number.



Figure 1: A street player's experience of Uncle Roy All Around You. From top-left to bottom-right: in the park, on the city streets, entering the office door, inside the office, in the phone box and by the limousine.

The online player's experience of Uncle Roy All Around You

An online player's experience of Uncle Roy All Around You begins at an initial webpage where they can read background information about the game and review instructions on how to play. They then enter a queue (as the number of simultaneous online players in the game is limited to ten) from which they are eventually released into the game to find themselves in a 3D model of the game space. They can move their avatar through this (using the arrow keys on their keyboard), can encounter other online players and can send public text chat messages (which are seen by all of the current online players).



Figure 2: images of interface from the street player's handheld computer: zoomed out mode (left), zoomed in mode (middle), and a message from Uncle Roy (right).

They also see representations of the street players, both as a series of cards that provide background details (notes on name, gender, appearance and a photograph that was taken when the street player first collected their handheld computer) and also as a marker that shows the street player's current position within the game. Two distinct types of positional information are provided. First, whenever a street player declares their position to Uncle Roy, their representation is highlighted in the 3D model using radiating lines accompanied by a dramatic sound. The online players also see the clue that Uncle Roy sends back to the street player. Second, an ongoing representation of position is shown as a pulsing red sphere. This position is determined from the position of the street player's 'me' icon on their map and is updated whenever they pan their viewpoint. As an aside, we can see here that Uncle Roy All Around You does not employ an automated positioning system such as GPS. Instead, position is implied through map use, either explicitly through declared location or implicitly through panning of the map viewpoint. We refer to this approach as self-reported positioning and have introduced it in Uncle Roy to see whether it might be a cheap and reliable alternative to the use of GPS and similar technologies (see [5] for a discussion of the issues arising from the use of GPS in pervasive games).



Figure 2: The online player's interface of Uncle Roy All Around You showing their avatar (white figure), a street player (red sphere), street player cards, and public and private chat areas.

Online players are able to send private text messages to individual street players as noted previously. They can also listen to the most recent audio message from each street player. Online players can find information in the 3D model that street players do not have, including the location of Uncle Roy's office and also photographs of some relevant features of the game space such as an image of his office door. They can then engage the street players in an exchange of information in order to help them on their journey – or possibly to hinder them if they so wish.



Figure 3: The online player's interface of Uncle Roy showing the map overview. The street player at the top (red star) is declaring their position to Uncle Roy.

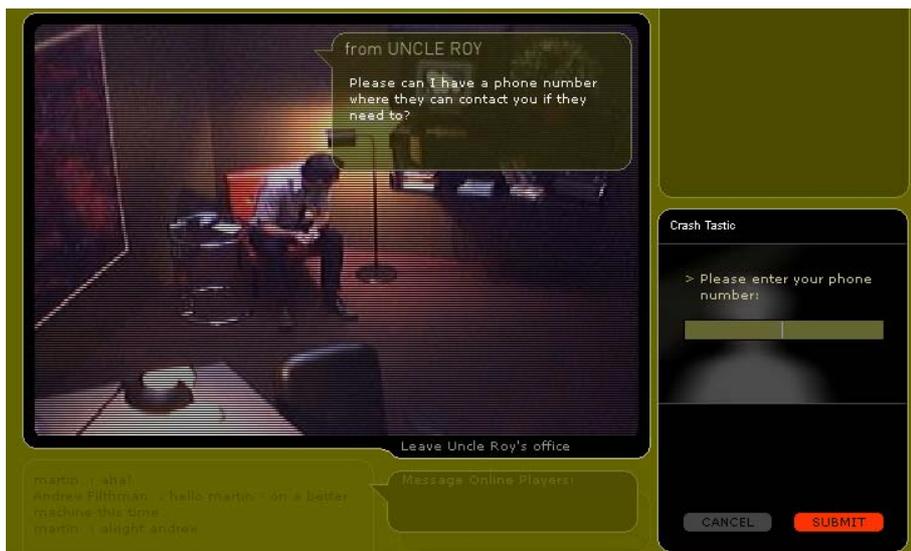


Figure 4: The online player looks into Uncle Roy's office through a webcam and is asked to give their phone number.

Finally, whenever an online player enters Uncle Roy's office, street players are invited to join them. If they do so, they see a live webcam view looking into the office which enables them to see the street player in person for the first time. They are then asked the same questions that the street player is asked in the limousine, including whether they will commit to help a stranger for the next year and if so, whether they are prepared to release their personal contact details.

After the game, we pair up those street players and online players who made a commitment to help a stranger and send them each other's details. They have now entered a year long contract with one another.

REACTION TO UNCLE ROY ALL AROUND YOU

A major theme of Uncle Roy All Around You is trust – trust in strangers, trust in online players, trust in Uncle Roy, and trust in the game itself. For street players it is about creating an extraordinary experience that calls into question their relationship to the city around them and its inhabitants. For online players, it is about being able to monitor street players, knowing more than they do and being able to influence or even manipulate them from a safe and anonymous distance.

At the time of writing, Uncle Roy All Around You has been staged once, in central London over two weeks in May and June of 2003. During this time it was experienced by 272 street players and over 200 online players.

Reaction from both the players themselves and the press has been largely positive. In a five-star rated review, London's Metro newspaper described the experience as "one of the most exhilarating theatrical experiences you'll encounter" adding "so you leave feeling contemplative, thrilled, and ever so slightly paranoid. What more could you ask from theatre?" Player feedback through questionnaires (one hundred completed immediately after playing) and email suggest that we managed to create an engaging experience. This was particularly true for street players who on the whole seem to have found the experience pleasingly disconcerting and scary (there are many references to such feelings on the questionnaires). The following paragraphs quote one street player who emailed us an account of her experience. We include this long quote here as it directly relates to many of our subsequent observations.

"My initial feelings were of slight paranoia because you knew you were probably being watched and certainly monitored. I felt very much on my own with no one to confer with or discuss how to do it, or if it was the right way. This was accentuated by the thought that people may be watching you 'doing it wrong'. I couldn't help but look around me to see who else might be in on it. There was only a limited amount of guidance, just enough to increase apprehension and maximise the impact of the experience.

Players were asked to leave all possessions at the ICA so I had no watch, mobile or map. This worried me because I didn't know the area and when directed to Pall Mall or other places, I had no idea where these were and unfortunately, the people I asked for directions got it wrong resulting in me heading in the wrong direction. This, however, didn't detract from the experience.

Generally, I was quite apprehensive before the experience because it was something I have never done before, and after the explanation, I felt just as worried! I would have rather played with a partner but it was good to have that 'on your own' feeling which is a feeling that is quite hard to provoke in a person.

At one point near the end you were directed to get into a car. I felt uneasy about this because you 'never get in a car with a stranger' but you assume it must be part of

the game because of the sequence of events that lead you to that point. I probably wouldn't have got in the car if there weren't this sequence of events leading up to it.

I found the game very absorbing and felt compelled to talk to two other players solidly for two hours afterwards which is a first for me. It was good that everyone had different experiences and that not everyone completed the game, although I felt like I had completed it by accident rather than any level of skill. I am intrigued to find out why I sent a post card and to whom and what is the outcome of it. This gives the game a level of continuation and suspense. I thoroughly enjoyed the experience. It is unlike anything I have done before."

Reaction from the online players was more mixed. Our impression here is some managed to engage with the game, understood how they could interact with the street players and invested a great deal of effort in guiding them to Uncle Roy's office. Inspection of game logs, especially private messages to street players, reveals that a few online players also seemed to enjoy manipulating the street players in other ways, scaring and teasing them or sending them in the wrong direction. However, other online players reported being confused about how to play the game, the purpose of the game, their specific role within it and how to use the interface. Our initial sense is that the online experience may have worked far better for those who had already been a street player as they had acquired an understanding of the street player's goal, situation and maybe even feelings, combined with knowledge of the physical game zone, including the location of Uncle Roy's office. Another important factor may have been the number of street players who were in the game. There were times when there were very few – sometimes none at all – in which case there was little for an online player to do. Conversely, the game would still have purpose and be quite playable for street players, even if there were no online players present. On reflection, it appears that Uncle Roy All Around You was primarily focused on delivering an experience to the street player in which on-line players could also engage.

MIXING THEATRE AND GAMES IN UNCLE ROY ALL AROUND YOU

In the final part of this paper, we highlight some of the techniques that contributed to the experience of Uncle Roy All Around You, with a particular focus on the ways in which live performance and programmed gameplay were mixed together in the street player's experience. This mixing of theatre and game occurred in four key aspects of the game: initial briefings; using passersby as unwitting actors; crossing the boundaries of normal behaviour; and in the general orchestration of the experience.

Initial briefings

The quote above suggests that first introduction to the experience, a carefully rehearsed briefing by an actor, played an important role in setting the whole tone of the experience. The briefing was quite formal and served to put the player in the role of someone who is on a mission. At the same time, having to leave their personal possessions behind them served to heighten tension, remove familiar props and increase dependency on the game. Retrieving them again at the end of the experience also provided a natural closing point. In a sense, they were stripped naked before being sent out into the city and were no doubt already in a state of heightened tension.

Using passersby as unwitting actors

Some of Uncle Roy's clues, such as the example of the tourist on the bridge mentioned previously, implied that passersby were in on the game when in fact they were not. Some of these clues gave instructions such as "Look for a woman with black hair. She will show where to go" and "If you can't see the street, ask someone discreetly for directions", while others made intimations such as "When you are sure no one is watching, cross the street and go down the steps." Such clues suggested that Uncle Roy was controlling elements of the real world around the players. While this was true later

on in the game in the office and limousine, it was not the case when following the clue trial. Such clues, combined with the knowledge that online players were clearly watching them, seemed to know where they were and also what they looked like, seem to have led some street players to assume that the physical game space was populated by actors – or at least to question who was an actor and who was not.

Crossing boundaries

There were several moments at which street players were encouraged to cross the boundaries of normal and indeed safe behaviour within a city. The first of these was to walk around the park and then the city streets using a handheld computer to follow instructions without having access to money or a mobile phone. The second highly significant moment was being asked to enter a strange empty office, look around and fill in a post card. The third and most provoking was being asked to get into a limousine by a stranger. These appear to have been powerful moments for many street players and they clearly drew heavily on live theatre. The office and the limousine, although both real, were controlled theatrical sets and the chauffeur was a performer. It seems that an important part of the game was being given permission to step outside of the normal boundaries of behaviour within the (presumably) safe and controlled context of a game.

Orchestration

The final aspect of the game that mixed live performance with preprogrammed gameplay was orchestration. This refers to the activities involved in ensuring the smooth progress of the experience and dealing with technical and other difficulties with minimal disruption to players' experiences [7]. Orchestration was a particular concern for us because our street players were in a remote and potentially dangerous environment over which we had relatively little control (even if they believed otherwise). Orchestration activities were centred on a control room located behind the scenes in which a team of two people monitored the game and tried to intervene when necessary. They were supported in this by a management interface that enabled them to track the last reported positions of all players and to inspect the technical status of any player in detail. This interface also enabled them to intervene directly in the gameplay by changing the state of individual players, for example manually advancing them to the next stage of the game. Intervention also involved live performance. First, the control room staff could improvise text messages to street and online players in the voice of the game – for example, generating new clues from Uncle Roy. Second, there were also three actors on the streets whose job it was to generally monitor the activities of the street players and to approach them and help them out (for example, resetting their handheld computers) if so instructed from the control room (over a walkie-talkie channel), as well as two performers responsible for controlling access to and managing the experience of the office. A final facet of orchestration was the role of the public text chat forum for the online players. This provided a valuable channel for more experienced online players to brief less experienced players as to how to play the game and resolve technical difficulties.

SUMMARY AND THE CHALLENGE OF SCALE

Uncle Roy All Around You has demonstrated ways in which games and theatre can be combined to create experiences that mix street and online players. One of the main techniques used to create a compelling experience – especially for street players – has been to mix preprogrammed content with elements of live performance. We can generalize this approach by observing that the content of Uncle Roy all Around You can be divided into three distinct layers.

- First, there is preprogrammed content, i.e., automated experience that is generated by the system in direct response to players' interactions. For the street players this consists of the clue messages from Uncle Roy and the pre-canned sequence of instructions in his office. For online players it consists of a 3D virtual model and its embedded information.
- Second, there is live performance. This involves rehearsed performances by actors that take place at key moments. Importantly, it also involves communication between different players, especially between online and street players.
- Third, there is orchestration, activities that mostly take place behind the scenes to manage the experience, but that sometimes spill over into the 'front of house'.

Street players experience all three layers. Live performance from actors dominates the beginning and end of the experience, while preprogrammed content provides the core of the middle part – following the trail of clues. Careful orchestration is required throughout. Communication with other players on the other hand, sits above these in the sense that it provides added value, contributing liveness and unpredictability, but is not strictly required (street players can complete the experience without online players being present). In contrast, online players experience more of a skeleton of preprogrammed content, no performance from live actors and little orchestration, beyond self-orchestration through the public text chat channel. Instead their main experience is centred on communication with the street players. For them, the experience largely depends on whether they can successfully engage with a street player and understand how to guide them.

We propose that this approach of mixing live performance and games can deliver powerful experiences. However, it also raises a major challenge for future work. Can it scale to larger events that involve many more players? Uncle Roy All Around You required significant human resources – a team of more than ten actors and crew – to deliver a rich experience to twenty players at a time. The challenge is now to find ways to mix programmed content with live action that scales up to supporting audiences of several hundred, to be a viable form of mainstream theatre, or many thousands, to be a viable form of computer game.

ACKNOWLEDGMENTS & CONTACT

We gratefully acknowledge the support of the Engineering and Physical Sciences Research Council (EPSRC) through the Equator project (www.equator.ac.uk), the Arts and Humanities Research Board (AHRB), the Arts Council of England and Microsoft Research.

REFERENCES

1. Benford, S D, Fraser, M C, Reynard, G T, Koleva, B, Drozd, A (2002), Staging and Evaluating Public Performances as an Approach to CVE Research in *Proceedings of CVE 2002* pp. 80-87 ACM Press Bonn, Germany
2. Benford, S., Anastasi, R, Flintham, M., Drozd, A., Crabtree, A., Greenhalgh, C., Tandavanitj, N., Adams, M., Row-Farr, J., Coping with uncertainty in a location-based game, IEEE Pervasive Computing, September 2003, 34041, IEEE.
3. Bjork, S., Falk, J., Hansson, R., Ljungstrand, P. (2001). "Pirates! Using the Physical World as a Game Board". *Interact 2001*.

4. Craven, M., Taylor, I., Drozd, A., Purbrick, J., Greenhalgh, C., Benford, S., Fraser, M., Bowers, J., Jää-Aro, K., Lintermann, B., Hoch, M., Exploiting Interactivity, Influence, Space and Time to Explore Non-linear Drama in Virtual Worlds, *Proceedings of CHI'2001*, 30-37, Seattle, US, April 2-6, 2001, ACM Press.
5. Flintham, M, Anastasi, R, Benford, S D, Hemmings, T, Crabtree, A, Greenhalgh, C M, Rodden, T A, Tandavanitj, N, Adams, M, Row-Farr, J (2003), Where on-line meets on-the-streets: experiences with mobile mixed reality games in *CHI 2003 Conference on Human Factors in Computing Systems* ACM Press Florida, 5-10 April 2003
6. Greenhalgh, C. M., Benford, S. D., Taylor, I. M., Bowers, J. M., Walker, G. and Wyver, J. (1999): "Creating a Live Broadcast from a Virtual Environment", *Proc. SIGGRAPH'99*, Los Angeles, August, 1999.
7. Koleva, B., Taylor, I., Benford, S., Fraser, F., Greenhalgh, C., Schnädelbach, H., vom Lehn, D., Heath, C., Row-Farr, J., Adams, M., Orchestrating a Mixed reality Performance, *Proceedings of CHI 2001*, March 2001, ACM Press.
8. Starner, T., Leibe, B., Singletary, B., & Pair, J (2000b), "MIND-WARPING: Towards Creating a Compelling Collaborative Augmented Reality Game", *Intelligent User Interfaces (IUI) 2000*, pp. 256-259.
9. Thomas, B.H., Close, B., Donoghue, J., Squires, J., De Bondi, P., and Piekarski. W., ARQuake: A First Person Indoor/Outdoor Augmented Reality Application, *Journal of Personal and Ubiquitous Computing*.