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Osama seeker

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Osama Seeker

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Abstract

Osama Seeker is an Art installation exhibited initially at 'Interventions' in Southampton. Julie Henry (Anthony Wilkinson Gallery) and Giles Perry (then Goldsmiths College) were the two contemporary artists involved. This paper discusses the design and realisation processes from the perspective of the collaborative technologist and designer, Darren Southee (Brunel University) and the artists. It is essentially a reflective 'walk-through' the project detailing some technological aspects contextualised by an opening statement from the artists. A closing statement reflects upon the final outcome and seeks to put the presented installation in context.

1 Introduction

1.1 Artists' Introductory Statement

In 2003 we were invited to participate in 'Intervention', a group exhibition at John Hansard Gallery that would depict artists' responses to the 'War on Terrorism'. In our case that meant producing work specifically for the show as we had not worked together previously.

The British and American governments had accused Saddam Hussein and Iraq of having links with Al Qaeda, but had yet to present much evidence of this. As is often the case in war, it was becoming difficult to distinguish between information and propaganda. We felt it was important to acknowledge the complexity of the issues by maintaining an open approach.

We began by considering the conflict in terms of its representation, and the way it had been narrated through the construction of powerful images such as the 'War on Terrorism', or 'Weapons of Mass Destruction', or 'Osama Bin Laden'. Much emphasis had been placed on the search for Bin Laden, so we decided to build an Osama seeking robot. It seemed to be in the interests of both governments and their allies to keep the public in a state of fear and paranoia about further terrorist attacks. Perhaps finding Osama could short-circuit this policy.

The Osama we were looking for was as much mythical as real and, as such, would be difficult to find. But our artistic investment was in treating the

task we had set ourselves very seriously, rather than producing an object for the gallery, so we approached Brunel University's department of Design and Darren Southee for help.

At this stage we had no preconceptions about what we would actually present in the exhibition, and we considered the design process as much part of the artwork as any outcome. We presented Darren with a functional requirements document written to avoid indicating how the problem would be solved.

1.2 The Brief

A summary of the brief is given below:

The robot will be an autonomous unit, capable of conducting its search indefinitely. The robot will be a serious and deeply committed entity, and will not be expected to perform tricks for the gallery going public; its behaviour and appearance will be determined only by the task it has been set.

The robot's core functional requirements as follows:

- The ability to operate autonomously.
- The ability to negotiate the natural environment.
- The ability to identify Osama by the assessment and comparison of individuals it encounters to its concept of him.
- The determination to never give up.
- The ability to communicate its position and progress to the artists.

- Where an Osama suspect is matched above a threshold confidence level, the robot will transmit notification of the suspect together with its position and the 'probability of correct identification' value.

However, the specifics of the design solution will - quite rightly - be left for the designer to determine. The cost per robot should not exceed £500.

1.3 Initial Concepts

An early idea considered the concept of embedding intelligence within objects considered precious, allowing the problem of transportation to be effectively carried out by humans. Replacing the precious object with a functional item, such as a 'camel bell', would allow animals to move the monitoring system around. While both these solutions offer points of interest, it could be argued that they do not fulfil the artist's request for a robot. Also, the probability of discovery, and the damage this would inflict upon 'the search', were sufficient grounds for rejection. After consideration of the geology of Afghanistan¹, the concept of an autonomous rock was born.

2 The Design

2.1 Sensing

A number of sensor technologies were considered. These included:

- DNA analysis
- Iris scanning
- Face recognition
- Fingerprint recognition
- Electronic nose technology
- Voice recognition

DNA analysis, iris scanning and face recognition were rejected immediately for budgetary reasons. The electronic nose technology, introduced in 1982, when Persaud and Dodd proposed a system, comprising an array of essentially non-selective sensors and an appropriate pattern recognition system, would struggle to be selective enough to discern an individual [1]. Fingerprint recognition technology was certainly at a stage where it might be incorporated into the design, but any robot attempting to find an individual using this method, would be somewhat environmentally invasive. The chosen method was therefore voice recognition. The im-

plementation of this technology allows for non-invasive monitoring of a particular location.

2.2 Location and Communications

2.2.1 GPS

The Global Positioning System (GPS) was developed by the US Department of Defence as a world wide navigation and positioning resource for both military and civilian use. It's based on a constellation of twenty-four satellites orbiting the earth. These satellites act as reference points from which GPS receivers on the ground can identify their position. The satellites are positioned in the orbit, so that at any one time 4 or 5 satellites are "in-view". This allows position coordinates (latitude, longitude) to be obtained from GPS signals 24 hours a day. This was the chosen location technology. GPS was a readily available cost-effective solution which had reached a suitable level of miniaturisation.

2.2.2 Spread-Spectrum Techniques

Spread-Spectrum is regarded as a 'secret communications technique'. In simple terms, the message containing location details is divided into short-duration packets. These short packages would then be transmitted over a range of frequencies. This means that:

- Only a receiver with knowledge of the transmitting algorithm can make sense of the message
- It is very difficult to discern that any communications are occurring because the short bursts of transmitted energy barely rise above background noise levels.

This method was discussed with the artists for information purposes only, given that it is a proven technology. Practical implementation would be difficult, and unnecessary for the installation, given radio licensing regulations. The chosen design solution would text a mobile phone

2.3 Power

Wind and solar power were the two considered options in order to achieve the brief's requirement that the rock should have a 'determination to never give up'. Solar power was chosen as the climate in the area of interest was suitable and it could be implemented more robustly than a wind-driven system.

¹ http://www.cageo.com/afghan_geo.htm

2.4 Transport Mechanism

A number of transport mechanisms were considered:

- A scissor mechanism that pushes two rock segments apart was rejected because of its inherent vulnerability to wind-blown objects such as sand.
- A weight-shifting mechanism attempting to cause a rolling action was also rejected due to the potential damage to the external pseudo-rock shell.
- A geared transport mechanism was chosen allowing 'flipping' to occur. Figure 1 illustrates this concept modelled in ALIAS².

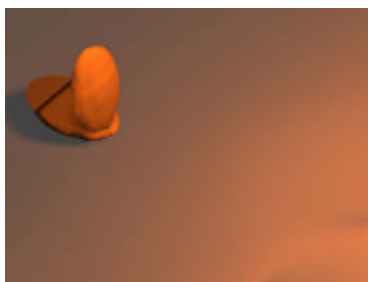


Figure 1: The flipping rock

2.5 Design Overview

Figure 2 shows a block diagram of the proposed Osama Seeker

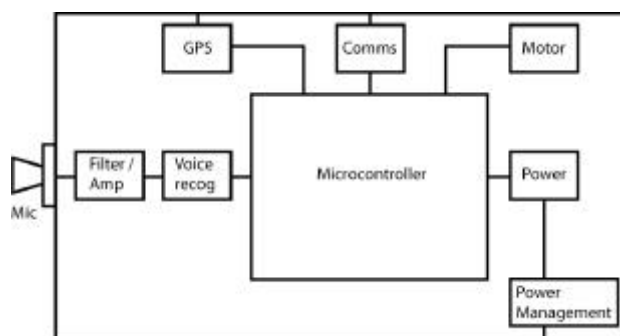


Figure 2: Osama Seeker block diagram

The rock is designed to 'listen' to its immediate environment in order to:

- Discern if any voices detected match the on-board algorithm of Osama's voice
- Discern if anyone is around. If not, it can enter basking mode and open the solar panels to the sun

If the voice recognition system believes that it has found a match, the GPS location information is communicated via the communications system.

3 Realisation

With the exhibition deadline a matter of weeks away, a decision was taken to develop a prototype to demonstrate the robot's movement. The concept for the fully operational device, including internal solar panels, GPS, communications systems and voice recognition would be communicated using a computer game-like DVD animation. The installation would therefore consist of a microcontroller-based rock-like artefact able to demonstrate movement, basking and listening modes and a short animation showing the proposed operation. Figure 3 shows the transport mechanism under construction. Figure 4 illustrates the style used in the animation. An assembly language program was implemented on a MICROCHIP³ PICTM16F877 microcontroller and the PCB installed within the rock.

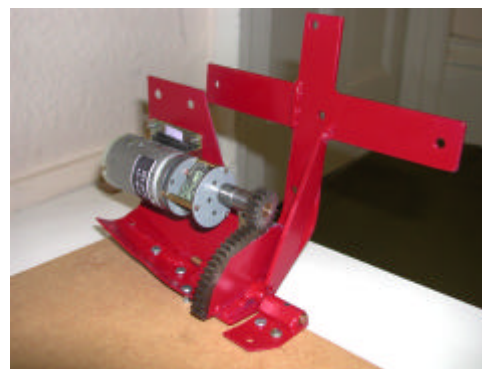


Figure 3: The flipping mechanism

² www.alias.com

³ www.microchip.com

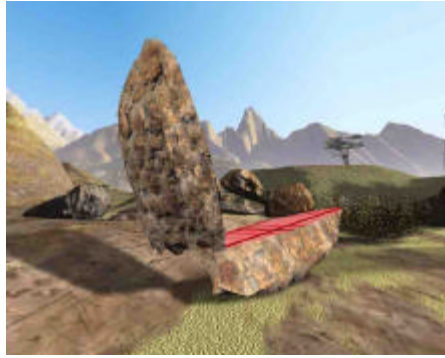


Figure 4: Animation still

4 Exhibitions and Reaction

Osama Seeker has been in the following exhibitions:

2004 'All tomorrow's parties', Yugoslav Biennial of Young Artists, Galerija Zvono, Belgrade.

2004 'Ready, steady, GO', Three Colts Gallery, London.

2003 'Interventions', John Hansard Gallery, Southampton

Bernadette Buckley, head of Education and Research at the John Hansard Gallery, commented in an interview with Kathy Kenny, the Interventions curator, that 'the piece is interesting in that it manages to use humour to respond to this horrible situation ...in effect, to parody. I think humour is a very effective coping mechanism in times of duress. But also, there is a serious side to their work which is about the nature of surveillance and the notion that even a seemingly innocent object, like a stone, could be spying on us.' She also concluded that '.....this response might be compared to that of the Dadaists – as opposed to that of Wilfred Owen's who had a direct involvement in the war. The Dadaists went off to Zurich and danced and played and wrote poetry. They had an anti-art response'⁴. Figure 4 shows the completed prototype at the Interventions exhibition.



Figure 4: The prototype 'on the move' at the John Hansard gallery

The curator Cecilia Canziani writes in the exhibition catalogue for the 2004 Yugoslav Biennial of Young Artists[2] that:

"... American foreign policy also provides the scenario for Giles Perry and Julie Henry's Osama Seeker. An installation composed of an object and a computer-animated video projection, the work comments on issues of global paranoia in the age of terrorism and makes the space of the gallery party to this general state. Similarly, each work on show proposes a reading of the present from a specific angle, thus agreeing with [Italo] Calvino that art functions existentially, as a way to make sense of the world. It is no accident, then, that these artists make use of media generally regarded as a translation of the real and conferring a degree of truth to its subject matter, for example photography, documentary and text – the written word has to be believed, the camera never lies. Even animation gains a stamp of authenticity when located in the appropriate context, such as TV news broadcasts or when used to demonstrate the deployment of a device in search of weapons of mass destruction. Nevertheless, there is something slightly discomforting in these otherwise plain bits of reality. They make us laugh and, by doing so, they make us think."

5 Artists' Closing Statement

Our original aim was always to build a fully functioning Osama Seeker. The gallery in Southampton might have been used as a showcase for the robot or, more likely, just a starting point on its journey. Either way, we wanted our audience to think about the robot, somewhere in the world, tirelessly searching. We chose the robotic rock solution because we felt that its attempt at invisibility, by mimicking the natural world, produced the perfect mental image.

⁴<http://www.hansardgallery.org.uk/exhibition/archive/2003/intervention/index1.html#interview>

In terms of a final outcome, this image represents an end of sorts. Perhaps the artistic purpose of actually building a fully functioning robot, rather than simply proposing one, can be argued if we think about 'Osama Seeker' the artwork having characteristics similar to those of a myth. Myths circulate in culture through narration, and are imaginary but in many cases have actual historical origins. The myth seems to form out of material generated by real events. In the case of Osama Seeker the suggestion is that an actual robot is needed to seed its mythological formation.

The prototype robot that was eventually built might function in the same way. It was displayed in the gallery alongside an arrangement of real, similarly sized, rocks and a 3D computer animation that imagines the robot's deployment. A short text was provided explaining that the device on display was a prototype and listing some of the technology that would be included in the final system. At intervals the robotic rock changed position by opening and flipping over. This action gives the work a comic edge and anticipates the Osama Seeker's inevitable failure.

The animation solved the problem of presenting Osama Seeker in a gallery context. It tells the robot's story, but positions the work more precisely than a straightforward description. Like the prototype, we see it as a physical manifestation of a larger project, albeit a later and therefore more fully resolved one.

Acknowledgements

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