

Spatial Awareness and Exploration of the Museum Building

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URL <http://www.museumbuilding.org/cube.html>

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ABSTRACT We are the collective CUBE (Creative Union of Building Explorers), a subgroup of the final project of the MSc Interactive Digital Media 2008/2009 course in Trinity College, Dublin, Ireland. The project's aim was to tell the story of the Museum Building inside the Trinity campus through an interactive website. CUBE's aim was to explore the Museum Building as an entity brought to life through its interactions with people. We researched the spatial environment of the building by recording and manipulating images and sounds, analysing patterns of circulation inside and around the Museum Building and investigating the experiences of individuals. The research and recording process was used to develop a unique and discoverable interface, which tells the story of the building through its rich spatial, visual and audio content rather than through a standard descriptive and informational narrative.

TECHNICAL BRIEF

Equipment used:

Nikon DSLR camera
Zoom H4 Audio Recorder
Sony Mini-DV Camcorder

Software used:

Flash CS3 with Actionscript 3.0
Adobe Illustrator
3D Studio Max

INTRODUCTION This paper examines the aim, process and outcome of our subgroup CUBE (Creative Union of Building Explorers) of the final project of the MSc Interactive Digital Media 2008/2009 course in Trinity College, Dublin, Ireland. The aim of the final project was to tell the story of the Museum Building, situated in the middle of the Trinity campus, through an interactive website.¹ CUBE is one of the six subgroups of the final project and is composed of four students: *Marcos Dias, Bin Bin Li, Dara Smith and Killian Walsh*. Our range of interests includes location awareness, audiovisual installations, digital art and social interaction. Although the architectural innovations of the building and its facade are of historical significance, we decided to focus the research of our subgroup on the spatial quality of the building and the different experiences of individuals interacting with the building.

The main entrance of the Museum Building is located outside the main circulation routes of the campus and is defined by an uninviting oversized door which lacks any signage. This leads into a small hall which opens up into the main spatial element: the impressive main hall and its staircase. The intensity of the natural light coming through the domes and windows and the richness of the sounds that define the spacious main hall contrast sharply with the sense of intimacy of the tightly enclosed spaces defined by the offices and lecture rooms surrounding the hall. This succession of different spatial qualities is a feature present in some of the greatest architectural spaces of the twentieth century, such as Oscar Niemeyer's "Cathedral of Brasilia,"² where a narrow underground entrance leads into a majestic bright nave. Like Niemeyer's masterpiece, the Museum Building can only be truly appreciated by entering it and experiencing its spatial quality, rather than simply admiring its facade. In both examples, it is the interaction of people with the space of the building that "brings it to life." To better understand this interaction process, we decided to start our research by analysing the context of the Museum Building inside the Trinity campus and the link between them through circulation patterns.

We argue that the interactions of people with the building and its variety of spaces and patterns of light and sound, rather than its physical structure, define the unique character of the Museum Building. Based on this assumption we defined our main aim: to tell the story of the building by interpreting it as a living being brought to life by its interactions with people. The final outcome was an interactive web interface,³ which consists of two main screens representing the Trinity campus and the Museum Building, on which we plotted the content collected from our experimentation and recording process.

Guy Debord defines ‘dérive’ as a technique of “drifting” through varied ambiances and where one or more persons “[...] let themselves be drawn by the attractions of the terrain and the encounters they find there.”⁴ This inspired us in creating a form of ‘digital dérive’, where the users can explore the interface through their personal experience of the underlying soundscape in the campus and Museum Building screens and the sound and light experiments we conducted in the latter.

The absence of detailed instructions, rich graphics or obvious informational clues invites users to explore the interface slowly, as opposed to the usual fast pace of web browsing. Rather than creating a standard informational interface with a predefined narrative, we developed an open canvas where, through interactive participation, the users can create their own spatial, visual and audio experience of the Museum Building without the need to be physically inside it.

DESCRIPTION OF THE PROJECT

Our project consists of a Flash-based interactive web interface which is broken down into two main screens: campus and building. Both the campus and the building screens of the interface consist of visual representations of space through the circulation patterns of people. We created a soundscape by recording sounds around the campus and inside the Museum Building. The sounds are activated, change intensity and interact with each other as the user moves the cursor around the screen. In the top right corner of the interface there is a text bar that gives information according to the current position of the cursor. There are also three clickable buttons. The first one opens a popup panel which contains a brief description of the project. The second button opens the Museum Building screen, and the third one opens a volume control.

On entering the interface the user is presented with an introductory quote, followed by the campus screen (FIGURE 1) which initially contains a loading bar and a short message encouraging them to explore slowly and use headphones for a better audio experience. Once the loading process is finished and the user clicks on the ‘begin’ button, the soundscape becomes active. As the user moves the cursor towards the centre of the screen, where the Museum Building is situated inside the campus, a distinct clickable node in the shape of a blue dot appears. When clicked, it activates a movie transition that opens the Museum Building screen (FIGURE 2).

This screen is presented in a three-dimensional view and also differs from the campus screen by displaying extra clickable nodes that access the content of our sound and

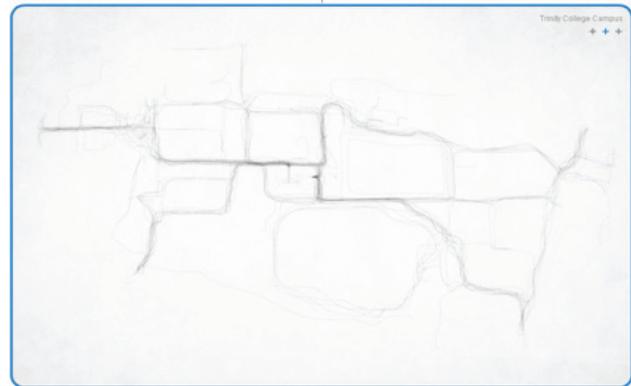


FIGURE 1: *Campus screen*



FIGURE 2: *Museum building screen*

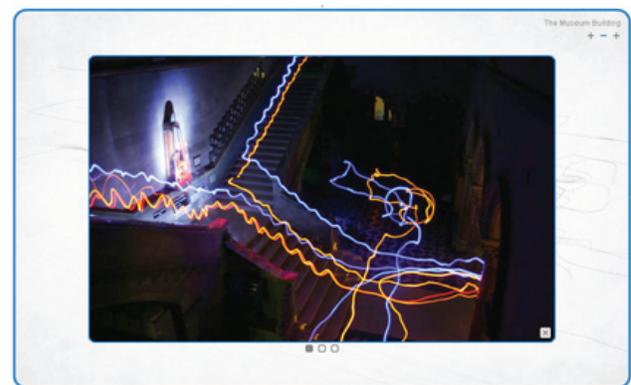


FIGURE 3: *Image pop-up panel*

light experiments and also user's drawings and interviews collected inside the Museum Building. The clickable sound nodes contain several sound snippets that are triggered and stopped by a single click. A different sound plays every time the user returns to the same node. The clickable image nodes open image popup panels (FIGURE 3) which display either user's drawings or our visual experiments with patterns and light trail manipulations. The underlying soundscape keeps playing independently of the clickable nodes, generating unexpected interactions between the visual and audio content.

The written content is limited to the informational text bar, the popup panel with the description of the project and the credits on the user's drawings. The aesthetics of the interface were kept simple to allow the content to direct the user experience. The blue border around the interface and the subgroup name in the top left corner were features added to comply with the design guidelines of the overall website.⁵ The only noticeable aesthetic feature in our interface is the 'pencil and paper' look, which relates to the basic plotting technique we used to collect the circulation paths.

INFLUENCES AND EXISTING WORK

During our research we were inspired by projects involving web interfaces, digital public installations, interactive sound installations, psychogeography and location awareness plotting through the use of Global Positioning System (GPS). We were inspired by the link between physical and digital worlds in "Uncle Roy all Around You" by Blast Theory, a 'game-performance' where participants in both the physical world and its virtual counterpart collaborate with a common objective.⁶ Blast Theory focused on the issue of trusting a stranger and on the unpredicted social interactions generated by their work. We were also inspired by Debord's "Theory of the Dérive"⁷ and his description of Chombart-de-Lauwe's mapping of a student's movements around Paris during the course of a year. It guided us in understanding the Museum Building as a 'victim' of the banalisation of the daily routines of our everyday lives. As we tend to follow the same trajectories day after day we lose our capacity to explore, discover and interact. Most visitors to the campus never heard about the building, despite its close proximity to *The Book of Kells*, the main touristic hub inside the campus. This inspired us to understand how digital media can be used to facilitate social interaction and the exploration of urban space and buildings in unpredictable ways.

While researching interactive sound installations, we came across David Byrne's "Playing the Building,"⁸ in which he transforms a derelict building in New York into

a giant musical instrument. He wired the keyboard of an old organ to electric motors attached to different parts of the building. When a visitor presses the keys of the organ they activate the motors, and the movement and vibration generated produced unique sounds. This inspired us to view the Museum Building as a living entity that can be provoked and manipulated, rather than simply documented and researched. Brandon La Belle's projects⁹ involving sound, location and audience participation also influenced our approach in using sound as a main element in the creation of narrative.

The plotting of circulation paths for aesthetic and scientific purposes is well documented. We were inspired by Cabspotting,¹⁰ which traces San Francisco's taxi cabs trajectories and creates a dynamic visual interface based on the live data. Andrew Mar's BBC series "Britain From Above"¹¹, which reveals the intermingling paths of hundreds of London taxis over the course of a single day also served as inspiration, although the GPS technology they used was beyond our means. Instead of using GPS units we plotted movement using pencil and paper, which in the end proved to be very effective, despite time and distance limitations.

DESIGN METHODOLOGY

In the early stages of our project we adopted a creative experimental process in the exploration of the spatial environment of the building. We drafted a manifesto¹² from the point of view of the building as a living being, where it 'expressed its intentions' and where we were designated by the Museum Building as the conductors of its "revolution." We conducted experiments across progressive levels of interaction: firstly, passive—observing people and the building while recording circulation, sound and light, and secondly, active—interviewing people, manipulating circulation, sound, light and encouraging the creative use of the building.

Based on these experiments we defined our methodology. We broke down the project into three distinct but interrelated layers which governed how the content would be presented to the user: *flow*, *wavelength*, and *people*. The *flow layer* represents the movement of people through the campus and building and represents the "circulatory system" that keeps the building alive. The *wavelength layer* represents our recordings and creative manipulation of sound and light within the space of the building. This includes photos of abstract patterns representing the diversity of surfaces and geological elements of the building and light manipulation experiments through long exposure shots. The *people layer* represents the experience and

creative input of people using the space of the building and includes interviews that we conducted and drawings made by them. We decided that the layers should interact with each other—sometimes in unexpected ways. This provided richness and depth to the narrative experience of the user and enhanced the element of discovery.

After our experimentation process, we created a design specification to define the functionality and aesthetics and guide us in the editing of the content and the production of the final interface. Finally, we developed several prototypes in Flash and tested them among different users, internet connections and operating systems. We divided the workload of the production process to optimise our time, but all the elements of the final interface were scrutinised by us as a group to ensure that they were coherent with our design spec and collective aim. We created a group blog¹³ where we documented the research and development process through regular postings and we also filmed and edited a video¹⁴ of our experiments inside the building.

IMPLEMENTATION

At the start of the project we had several group meetings to discuss our initial interests. We also did some research to gather influences and identify existing projects based on our interests. We determined a collective direction to our project by identifying common interests and the technologies and resources available to us. We all had an interest in the experience of people interacting with the space of the building and its surroundings.

Based on this we conducted our first experiment: following people's trajectories and plotting their paths on paper to understand the patterns of circulation inside and around the building (FIGURE 4). We recorded a start and end time for each plotting and observations about the people we followed. We tracked people as they left the Museum Building until they left the campus or entered another building inside it. We also tracked the circulation of people coming into the campus until they entered any building inside it. These "patterns of everyday life" presented us with several narratives which we merged into one by plotting all the circulation paths into a single map. This gave us an informational map of the Trinity campus which did not serve statistical or scientific purposes, but rather gave us an insight into the different experiences of people through their movements inside the campus. The direct routes of students, lecturers and couriers coming in and out of the building contrasted with the random routes of tourists and lost people wandering around aimlessly inside the campus.



FIGURE 4: *Circulation plotting*

We extended this experiment to the Museum Building and plotted the circulation of people as they entered the building until they left it or entered a private room. This was slightly more complex than the campus experiment, as we had to plot people's movements inside the building onto four distinct plans as they moved through different floors. It also presented us with a challenge: how to join these split paths into one coherent narrative while obtaining a visualisation similar to the campus map.

While analysing the informational map of the Trinity campus we created, we realised that the paths alone constituted an alternative way of representing the campus itself. After deleting all the information about buildings and urban infrastructure, it was still possible to identify the campus through the plottings of the circulation of people. This guided our overall design approach: the content we collected through the plotting of people's trajectories became the main element of our interface, rather than the standard plans of the campus and the Museum Building.

We decided to use the same approach for the Museum Building screen, which is accessed by clicking on a node in the middle of the campus screen or alternatively through a button on the top right corner. To represent the circulation paths of the building as people moved across different floors we decided to represent them in a three-dimensional view from an angle that identified the building without the need to show its physical structure. Most user that had previously visited the Museum Building identified the building by the shape of the dense overlapping paths coming from the main entrance and moving upwards in two different directions to compose the main staircase.

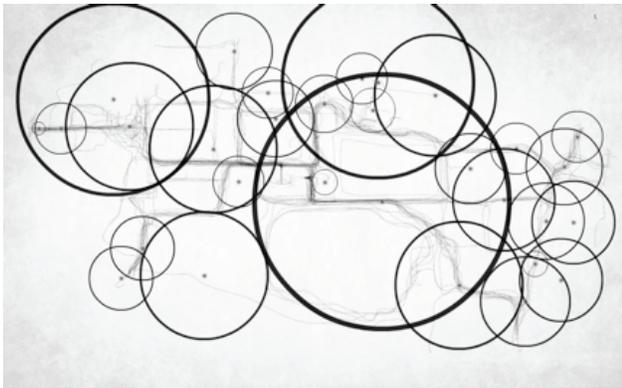


FIGURE 5: *Campus soundscape*

We recorded sounds around the campus and plotted them onto the campus screen, creating an interactive soundscape (FIGURE 5). As the user moves the cursor around the screen these sounds interact with each other according to their location and range, creating an individual sound narrative controlled by the user. We did the same for the Museum Building screen.

After that, we wrote down a list of further experiments based on our manifesto. We paid several visits to the campus and the Museum Building. These included two long nights of experiments inside the building where we had the opportunity to interact with it while it was empty and manipulate light and sound without disturbing its users. We used audio and video recorders and digital still cameras to capture our experiments. We also used amplifiers and loudspeakers to conduct sound feedback experiments, light emitting diodes (LEDs) for light experiments and used marbles and a golf ball to manipulate sound inside the building by striking different surfaces and carefully releasing them down the staircases.

Our initial light experiment involved taking photos from a fixed point at regular intervals to observe the changes of light within the building. This was later discarded, as the quality and pattern of the light did not change significantly. We also took close-up photographs of patterns inside the building and experimented with long exposure shots in the dark using LEDs to create patterns and trails inside the Museum Building. The results of this experiment were very interesting, so we repeated the experiment at a later occasion. The experiments' data was compiled, edited, and scrutinised in order to decide which ones would be incorporated in the final interface.

We also conducted interviews people inside the Museum building to find out about their connection with it, their first impressions of the space and what they liked about it. Interviews were left as open as possible to allow

participants to freely express their opinions and to encourage them to digress into stories about the space. We recorded all the interviews and these sound files were later edited into short clickable audio snippets and incorporated into the final interface.

Once we had all the final content selected and edited, we started to develop the final interface by creating several prototypes in which we tested the interaction of the different components of the interface, the download speed and the usability. Eventually, we created full prototype versions with the campus and Museum Building screens and the transition between them. These were tested thoroughly across different platforms, connections and users. This process was facilitated by the use of extensible mark-up language (XML) to bring the content into the Flash interface, which allowed us to fine-tune the position and intensity of sounds with ease and to replace image and sound files without having to change the main programming code in the interface. At this stage we did several minor changes to the usability and aesthetics of the interface based on feedback from different users and from our own testing. These included changes to the default sound level, clickable node sizes and text bar tags. Once this process was finished, we incorporated it into the overall website.

CONCLUSION

Our main aim was to let the Museum Building tell its story by viewing it as an entity brought to life through its interaction with people. To achieve this, we recorded the circulation of people inside and around the building, their stories and opinions about it, and asked them to express their feelings about the building through personal drawings. We also recorded sound and light and ran experiments in which we manipulated these elements, "provoking" the Museum Building to get a reaction out of it. The rich content gathered from this process generated a discoverable experience of the building through its spatial qualities, rather than through its historical or architectural relevance.

During the development of the project we moved away from a descriptive and informational approach towards a discoverable and experimental process as we realised that the content could become the interface itself. The simple and discoverable interface that we produced allows users to create their own experience and narrative of the Museum Building at their own pace, by exploring the interrelated layers of flow, wavelength and people. By situating the building into the context of the campus we were able to identify the circulation of people inside and around it as "giving life" to the building. This movement represents the "veins" and "arteries" of the Museum Building.

By toning down the visual aspect of the interface and underlying it with a rich soundscape, the user can reinterpret the space of the building. The creative input and experience of daily users and visitors of the building along with our own experiments highlighted the fact that public spaces and built structures present us with an open canvas and unlimited potential of exploration by linking the physical world with digital technology and generating new forms of interaction.

During the final phase of implementation of our interface and user testing we found that most users were spending more time browsing the underlying soundscape than clicking on the nodes to get to the interviews and images. The sensorial experience generated by the soundscape was experienced in different ways depending on the user. Some would interact with it by moving the cursor along the circulation paths, while other users explored it randomly. Nevertheless, this experience seemed to captivate most users, despite the fact that we are bombarded by increasing levels of information online and we spend increasingly less time in each of the several web interfaces we browse on a daily basis.

We would have liked to expand our experiments to try and generate social interaction between daily users and visitors of the Museum Building and let them have more creative input in the final interface. Based on our manifesto, we had initially planned to experiment with game-performances and possibly let users run the experiments we conducted rather than ourselves. But there were some health and safety concerns and we were sensitive to the fact that there were research and teaching activities being conducted inside the building on a daily basis that could have been disturbed.

Despite that, we were happy with the outcome and believe that our collective approach to our project and the constant revision of our design process allowed us to achieve our aims and tell the story of the Museum Building in a different light.

ACKNOWLEDGEMENTS

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BIOGRAPHY

Marcos Dias is a digital media designer interested in the facilitation of social interaction through digital narratives in physical spaces. He studied Architecture in the University of Sao Paulo, Brazil and has recently been awarded an MSc with Distinction in Interactive Digital Media from Trinity College Dublin, Ireland. He is presently participating in the Designing Dublin project, a multidisciplinary initiative run by Design Twentyfirst Century (<http://www.design21c.com>) in partnership with the Dublin and Fingal City Councils. His work is documented at <http://www.lightartworks.com>.

NOTES

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