

The Intelligent Street

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ABSTRACT

The Intelligent Street is a music installation that is able to respond intelligently to the collective requests of users interacting together. The performance it creates is largely influenced by the collective set of text commands from users' mobile phones. In this way, users in shared environments, subjugated for so long to uncontrollable and often undesired 'muzak', can now directly influence their sonic environment and collectively create the aural soundscape that *they* desire. We see our project as enabling inhabitants of any given space from *passive consumers* to *active creators*, and anticipate it has significant commercial, social and educational potential.

Keywords

Algorithmic Music, Ambient Intelligence, Prototype, Intelligent Responsive Sound, Algorithmic and Generative Composition, Software Architectures, Human Computer Interaction,

INTRODUCTION

The use of music, or muzak, in public places is extremely common. However, the individual within that space has no control over the performance of that music, and it can often become intrusive and unwelcome. In our work we are interested in building interactive and responsive sound installations, where the performance results directly from the interaction of the users within a given space. This project, known as the Intelligent Street, has been developed collaboratively in Sweden and the UK.

The mobile phone has been selected as the controlling medium for this project because of its widespread use as a tool for communicating today, available to practically everyone. By making use of this easily accessible device we offer almost every passerby the opportunity to actively

engage in affecting the sonic environment. Intelligent Street seeks to explore new possibilities and unexpected applications for the mobile phone. It is a project in which we wish to investigate alternate ways of composing music for non-linear media and attracting participation in a creative process through interaction.

Another ambition we had was to demonstrate the social need for aural as well as visual stimulation within a well designed environment that could impact on future architectural designs.

THE INSTALLATION

The physical environment is a walk-through area with soft, barely audible background sound. The pre-defined commands available to users are highlighted in scrolling text on a projected graphic display within the walk-through area. We did not give details of precisely what the commands did and part of our strategy has been to ascertain whether the affects of a command satisfied the users expectation or intention.

The user sends a text message to the system and this gets stored in a buffer. At regular intervals all the commands in the buffer are used to determine how the music alters, and the buffer is cleared. Thus, the music changes and a new aural experience is created.

As with all human action, one of our primary considerations was that users should be able to clearly notice the effect their interaction has produced on their environment. Additional commands can tailor the music or alter it radically. If user activity reduces the music gradually decreases in volume and if no-one interacts for a long enough period the installation goes back to the barely audible background mode.

User Interaction

The musical output is derived from a set of musical styles and the ongoing history of all user text commands. Pre-composed pieces of music are restructured, combined, manipulated and then processed as determined by the user. Essentially, text messages are translated into musical operations. Subsequently, users text commands affect the

mood, energy and style of the music and thus the installation reflects the desires of those around it.

Musical Structure

The music has been built within a framework containing 8 *styles*. The styles can be referred to as songs composed in different genres, each of these built upon 10 tracks. Every track consists of a number of musical elements that make up the musical structure of the style. These styles are then blended with each other by the tracks being cross-faded and substituted.

In all there are twenty commands available that all have different functions. Eight of them correspond to the *styles* described above and selecting any of these adds elements from these styles to the soundscape. The remaining commands have functions that modify the current blend of styles, such as change of tempo, pitch, adding or removing effects of various kinds.

These styles represent a composers attempt to capture the essence of a musical genre, based on our perceptions of what our users currently listen to.

The Commands

The commands chosen to feed to the system and alter the music with are specifically thought out to be "non-musical" terms. A command such as "*cheese*" or "*air*" gives the user the option of freely associating to what he or she means by such a word rather than building up the expectations a musical term would. However, there are some universal meanings to some terms which the project group have considered and interpreted "*dark*", for instance, emphasizes the lower frequencies of the music, cutting the higher frequencies and also diminishing focus on the tempo to give the music a *darker* timbral quality. When commands such as "*dark*" are repeated the music is affected increasingly, until an absolute lower bound is reached that was pre-defined.

Visual Interface

Along with the menu of available commands, the visual projection shows a live video feed of the equivalent space in London or Piteå respectively. Text projected on this image informs the user about the interactions taking place. The visual aspects of the piece make up an integral part. All user interaction is logged and when a command is sent it is projected on the image together with an abbreviation of the senders phone number. The user will be able to see from who each command originates and when it was sent and relate this to the changes in the music.

Through these we can see which command is currently influencing the music. Pending commands are also displayed, all of this designed to improve comprehension and increase peoples willingness to take part in the installation. The participants are then given a sense of excitement and expectation about how their commands may affect the performance. The commands are each associated with a timer that counts down to 0, when the command is processed and the performance changes accordingly. It is interesting to notice how satisfied the user gets about what actually happens.

TECHNICAL PLATFORM

SuperCollider2 (SC) was chosen as the synthesis platform for the main audio engine of the installation. Over its 8 years of development SC has established itself as probably the most powerful, flexible and stable real-time synthesis environment available. Along with the SC2 sound engine there were graphics, video-link and the connection to the Vodafone SMS services which were handled by custom written software in Max/Msp and Python. The communication between the programs is written using the Open Sound Control (OSC) protocol.

EVALUATION

Evaluation has been performed by students from the Behaviouristic Department at Umeå university. The results from this showed an appreciation amongst the subjects towards installations of this kind. The idea of having commands that didn't refer to the music in technical terms also turned out to be something that provided user satisfaction. By not using words directly related to musical performance (eg using *energise* rather than *transpose*), we were able to instill a sense of curiosity as well as expectation in users.

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