DigiWall

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1 Introduction

DigiWall is a sonically enhanced, 6m by 2.6m climbing wall with illuminating foot and hand grips. This large-scale, tangible interface forms a highly physical computer game interface. Sensors embedded in the grips along with seven audio speakers support computer-mediated, interactive, musical and physical games. Illuminated grips and spatially distributed sound sustain interactions by guiding climbers towards target locations, climbing speeds, etc. No computer or TV screen is incorporated into the wall. Instead, the climbing grips on the wall act as a very low-resolution mono-chrome display. In DigiWall interactions, most of the feedback from the computer system comes through sound rather than through visuals. Since the user does not have to keep her eyes on a screen, she is free to move over the whole wall. The immersive quality of the gaming experience is delivered through the sound of the games.

Climbing demands strength, body coordination and control, endurance and flexibility. These challenges are combined in DigiWall interaction models which bring together the joy of playing games and the sense of presence and immersion offered by a rich sonic environment.

DigiWall is mainly intended for public spaces and as such not only becomes part of the visual landscape but part of the sonic environment, as well. This necessitates an approach to sound design that not only delivers quality audio in open, active environs, but also creates an atmospheric component that immerses climbers in the activity and enhances the location where the wall is installed. DigiWall becomes an integrated, interactive part of that environment - a part that invites the public to create the mood and atmosphere within the space.

2 Background

DigiWall draws its inspiration from several areas of research: tangible interfaces for audio creation; audio-based games; computer games without screens; sound design. The DigiWall interface and its interaction models are designed to be an attraction for both players and audience alike. The design enables the user to manipulate and interact with the sound and music system in a highly physical way. In addition, the absence of a screen allows interaction designers and climbers to explore the boundaries of physical engagement and music-making. DigiWall is a large-scale interface. And, unlike other music composing and performance interfaces, DigiWall strives to limit visual demands and develop and enrich the audio-mostly interface concept.

Computer games have expanded beyond entertainment and have proven to be very strong motivators for skill development in education, and are finding new applications in fields as diverse as health care and military training. Music is a similarly strong motivator. Music can enhance drama, establish a sense of time and place, inspire and synchronize movement. By combining these with a large, highly physical computer interface, unique potential for increased physical activation and improved physical conditioning is created.

3 Interaction models

Several interaction models, or games, of different types have been developed for DigiWall. They represent three areas of interaction experience – competitions, collaboration exercises and aesthetic experiences. In the competition Catch The Grip, the task is to collect as many lit climbing grips as possible in one minute. The game starts with a short, spoken-word description of the task, one grip in the centre of the climbing wall is illuminated. After this, background music starts to play. When the player touches the illuminated grip, a new grip to catch is illuminated. The grips between the touched grip and the next grip to touch is illuminated in rapid sequence. For each grip that illuminates one note of a melody is played in sync with the light. This indicates, both visually and musically the direction and distance to the new grip to catch. The musical intensity of the background is increased all the way and after one minute it reaches a climax denoting the end of the one minute round.

Scrambled Eggs is a ten level collaboration exercise. After a short, spoken-word introduction, eggs denoted by illuminated grips and alert sounds start to fall from the top of the wall. The task is to save the falling eggs before they smash into the floor. Three smashed eggs on the same level means the game is over. Each level lasts for thirty seconds. Music signals the progression of time, a sound effect signals the end of a level, a speaking voice and new background music signals the beginning of the next.

In Memory the task is to find pairs of climbing grips that trigger the same sound. All grips with sounds attached are illuminated. When a pair is found, that sound is added to the background music. In this way the player or players step by step build a song. As new sounds are added to the background music, the overall soundscape becomes more and more complex, making it harder to find new pairs. As in the other interaction models, Memory is introduced by a speaking voice. When all the pairs are found a rewarding melody is played. Currently new interaction models based on spoken language and narratives are being developed. These games involve creating short poems, constructing stories, and generating sound effects for a radio theater like performance by climbing on DigiWall