

# Sonictroller

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## ABSTRACT

The Sonictroller was originally conceived as a means of introducing competition into an improvisatory musical performance. By reverse-engineering a popular video game console, we were able to map sound information (volume, pitch, and pitch sequences) to any continuous or momentary action of a video game sprite.

## Keywords

video game, Nintendo, music, sound, controller, Mortal Kombat, trumpet, guitar, voice

## 1. INTRODUCTION

Sonictroller is a prototype interface used to control existing video games with sound. The interface connects directly to the console and is flexible enough to map sounds to any existing video game. Incoming sound is converted to midi, midi data is used to trigger a PIC microcontroller that sends information to the video game console.



Figure 1. Keyboard Rampage

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In our first version, we were successful in mapping notes from classical guitar and trumpet to actions in the game Rampage. We took advantage of the sound producing capabilities of each instrument to control the monster in the game: since it can sustain notes more easily, the trumpet controlled direction and the guitar used staccato notes to trigger punch/jump and start/pause buttons. We were able to quickly master Rampage, and were excited to try out our prototype in a more competitive situation.



Figure 2. Trumpet Rampage

In a public demo version of the Sonictroller at the ITP Winter Show 2004, a control interface comprised of midi keyboard and microphone controlled combatants in Mortal Kombat Trilogy. The keyboards were divided into four regions, each region mapped to the directional buttons on the controller, and audio signal from the microphones triggered punches by the respective fighters. Playing the keyboard caused the characters to dance on the screen, and the louder one shouted, the more fiercely the fighter attacked.

We employed this simple mapping structure in order to encourage participation by as many players as possible, regardless of musical ability. "Keyboard/Vocal Kombat" provided for an extremely entertaining and engaging experience for both the user and the audience.



Figure 3. Keyboard/Vocal Kombat



Figure 4. Keyboard/Vocal Kombat Choreography

## 2. APPLICATIONS

Sonictroller has potential applications in the fields of music performance, music education and assistive technology.

The most recent application of the Sonictroller is a composition featuring two competing guitarists mapped to opposing characters in the two-player fighting game *Mortal Kombat Trilogy*. The piece, entitled *Modal Kombat*, features virtuoso classical guitarists David Hindman and Evan Drummond, and takes the concept of dueling banjos to an entirely new level. The guitarists play an original composition that is translated into choreographed action in the game.

There are rich opportunities in the field of music education. By mapping meaningful button-pushing patterns to musical phrases or scales, students learn to play music while immersed in their favorite game. We are in the process of developing an original video game in which users need to master musical exercises in order to progress in the game.

There are also possible applications in game accessibility. Using the voice as a controller would provide users with motor impairment or disabilities a challenging musical interface for existing video games.

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