A Single Performer Controlled Interface for Electronic Dance / Music Theatre

Mark A Bromwich
Department of Music
The University of Huddersfield
Huddersfield
West Yorkshire HD1 3DH
ENGLAND
SMUSMA@Pegasus.hud.ac.uk

Abstract: The Navigator represents an attempt to create a new and specific form of dance/music theatre through the creation of a sensitised performance space. This project grew out of a desire to find a more cohesive form of collaboration between director (Julie Wilson) composer (Mark Bromwich) and performer (Chris Bristow). The aim was to develop a ’true’ dialogue between music, live electronics and performance. Custom designed ‘Controllers’ and ‘Virtual Instruments’ were developed and built by the author augmented by commercially produced Proximity Sensors developed by The University of York’s Electronics Centre. This paper describes the technical realisation of the performance.

Implementation: The conversion of Sensor to Midi information was achieved by using the newly developed ‘Midi Creator’ - an analogue to Midi interface. Each Creator has 14 inputs detecting +/-5V or 0 - 3.2V proportional signals. An integrated digital audio/sequencer program was required to provide the communication link with the Midi information generated by the Midi Creators. This program was also required to hold pre-composed material as digital audio soundfiles and midi note information to be transformed / manipulated in real time by the performer. Opcode’s StudioVision Pro was chosen for its host program due to its excellency ‘Midi Keys’ system of external event triggering and control. The potential problem of having a large number of midi sensors sending ‘live’ information via the midi-computer interface was overcome by using a midi controlled matrix/patchbay. As all of the Midi data was to be routed through the computer ports a way was needed to change the program’s ‘device thru’ allocation whilst the program was running, and from the program itself. As ‘midi keys’ can change the ‘thru instrument’ using an external midi signal, a way of routing midi data from one of the matrix’s output ports to an input port was required which would not result in ‘midi overrun errors’. A solution was to send program changes to the PC1600 midi controller to recall a setup string which in turn could be connected to an input port thereby affecting instrument changes. Lighting information was stored in sequences as System Exclusive messages conforming to the Midi 1.0 Show Control protocol.

Performance Set-up
System Hardware: Roland JD990 sound module, Yamaha SY99 Synthesizer, Korg Wavestation AD sound module, Peavey FC1600 Midi Controller, Roland SE770 digital midi effects module - providing real time transformation of the performers voice. Computer System: Macintosh IIfx c/w 13Mb ram, SoundHD & Digidesign Audiomedia 2, Lighting System: Strand GSX lighting console c/w "Communique" Midi Show Control software, Audio System: Mackie CR1604 console with OnoMics Midi automation. Sensors/Virtual Instruments: Midi Gesture - antistatic transmitter/receiver, Midi Sensor - capacitive proportional controller, LDR proportional controllers, X.Y resistive "joystick" controller, Conductive foam - pressure transducer, Velocio Wands - set mounted switch triggers and pressure pads, Creator Software: Version 3.0 c/w 2 extra EPROM card each giving 8 extra 14 channel control configurations. The EPROM cards were programmed to provide additional generation of Midi controller information for the required real time timbral control.

The Virtual Instrument: the "Cosmic Instrument" was built as a virtual Theramin and consists of a vertical structure resembling the Experimental Instrument proposed by Robert Fludd (1574-1637). A 10kΩ multi turn potentiometer was mounted at the base of the structure wound with radio drive-over to a pulley wheel arrangement mounted at the top of the scale. The potentiometer was connected to one control voltage input to the PC1600 midi controller which was programmed to send a simple coiff message together with a variable controller message to control the filter frequency of a self oscillating filter on the SY99 synthesizer. The increase and decrease in pitch of a pure sineoid emulate Theramin's original instrument was thus realised.

The "Velocity Wands" consisted of 2 metre length of 5mm plastic tubing with Mercury switches embedded in 4 at one end. Due to the inertia required to affect a closed contact at any or all of the 4 axis an extremely effective visual choreographic sequence of triggered samples could be realised.

The "Joystick Controller" an old apple II resistive X.Y joystick was acquired and modified to receive and send the correct range of voltages to a Midi Creator. The stick itself was extended to 3 metres in length so that a large physical movement was required to affect the required timbral changes from the Roland JE990 sound module. The creator itself used 2 inputs programmed to send 5 different control numbers messages from the X and Y inputs.

LDR Sensors: an arrangement of light dependent resistors connected to simple potential divider networks were used to effect a great switch on/off commands and proportional signals.

Performance Concept: Both the music composition, the script, choreography and modes of performance adhere to the concept of a developing state of communication set against a progressive complexity of developing technology brought about by the passage of time. In the first three sections of the performance "virtual instruments" are incorporated into the set, or are used as props, which are "played" by the performer, and as such are recognised by the audience as possessing the same characteristics as instruments. As the technology becomes more complex, "virtual instruments" disappear and are replaced by hidden triggers and sensory devices which are concealed within the set. At this point the "set" is given the ability to speak through the use of samplers, and independently amplifies the "sub text" of the dramatic narrative through short sequences of composed music, triggered as an integral part of the dramatic action.

Conclusion: While the amount of technology in the show is extensive, the effect on stage is dynamic and aesthetically - sometimes the cause of an effect - obvious, at other times it is difficult to detect and rationalise. Sound and light sequences seem to interact spontaneously with each other, and the overall effect is one of total fluidity within the existing dynamics of dramatic tension.

This collaboration has given birth to new ideas and possible ways of working in the future such as using Midi Show Control more intensively to control things as hydrolics, robotics and video effects. Since the show was premiered the artists involved have collaborated further on the design and construction of an interactive Midi sound sculpture installation commissioned by Wakefield City Art Gallery.