

An Artificial Intelligence System to Mediate the Creation of Sound and Light Environments

Claudio Benghi

Northumbria University,
Ellison Building,
Newcastle upon Tyne, NE1 8ST, England
claudio.benghi@northumbria.ac.uk

Gloria Ronchi

Aether & Hemera,
Kingsland Studios, Priory Green,
Newcastle upon Tyne, NE6 2DW, England
hemera@aether-hemera.com

Introduction

This demonstration presents the IT elements of an art installation that exhibits intelligent reactive behaviours to participant input employing Artificial Intelligence (AI) techniques to create unique aesthetic interactions.

The audience is invited to speak into a set of microphones; the system captures all the sounds performed and uses them to seed an AI engine for creating a new soundscape in real time, on the base of a custom music knowledge repository. The compositions is played back to the users through surrounding speakers and accompanied with synchronised light events of an array of coloured LEDs.

This art work allows viewers to become active participants in creating multisensory computer-mediated experiences, with the aim of investigating the potential for creative forms of inter-authorship.

Software Application

The installation's software has been built as a custom event manager developed under the .Net framework that can respond to events from the users, timers, and the UI cascading them through the required algorithms and libraries as a function of specified interaction settings; this solution allowed swift changes to the behaviour of the artwork in response to the observation of audience interaction patterns.

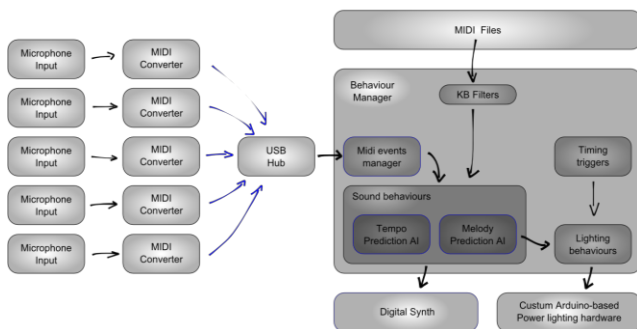


Figure 1: Scheme of the modular architecture of the system

Different portions of the data flow have been externalised to custom hardware to reduce computational load on the controlling computer: a configurable number of real-time devices converters transform the sounds of the required number of microphones into MIDI messages and channel them to the event manager; a cascade of Arduino devices control the custom multi channel lighting controllers and the sound output stage relies on MIDI standards.

A substantial amount of work has been put into the optimisation of the UI console controlling the behaviour of the installation; this turned out to be crucial for the success of the project as it allowed to make use of the important feedback gathered in the first implementation of this participatory art work.

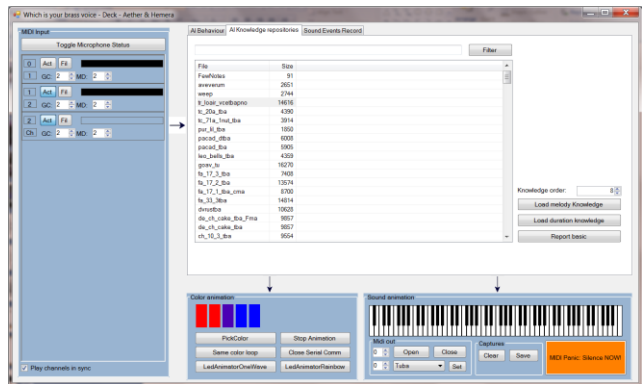


Figure 2: GUI of the controlling system

The work was first displayed as part of a public event over three weeks and allowed the co-generation of unpredictable soundscapes with varying levels of user's appreciation. The evaluation of any public co-creation environment is itself a challenging research area and our future work will investigate and evaluate methodologies to do so; further developments to the AI are also planned to include feedback from past visitors.

More information about this project can be found at:

<http://www.aether-hemera.com/s/aib>