S’n‘S (Sound and sensors)

Type of Project

Ongoing research project

Summary

S’n‘S (Sound and sensors) is a system of musical instruments designed and prototyped with a twofold purpose to experience sound bodily without knowing music and to implement “eco-technological” tools entirely recyclable and remixable in their physical and digital components.
It is a five-instrument (guitar, bass, didgeridoo, DJ console, and Theremin) system entirely made of reused cardboard packaging, embedding different sensors and actuators. The software developed to control the system is open source and realised by assembling and adapting open source code. The The hardware components of the system include an Arduino platform, two ambient light sensors, two LilyPad accelerometers, a flex sensor, and an ultrasonic range finder. In order to make the system fully remixable and recyclable, the sensors are not soldered: they are connected to an Arduino Proto Shield through headers to allow re-use, hacking and adaptation at any time.
The DJ console was used in an experimental field trials with children linguistic impairments.

Low-tech, high-tech products, services and contexts for play

The system can be used in different contexts such as schools, rehabilitation center and playful environment.

There is not a specified target groups. S'n'S can be used from different children or adult people.
In the spirit of regenerative remixing, the software developed to control it, is open source, and realised by
assembling and adapting open source code. The project addresses people who are not expert musicians, and may
want to approach music in a bodily and engaging way, using gestures and imagination as driver of their performance. S'n'S' is composed of tools inspired by electric guitar and bass, theremin, DJ console and didgeridoo.
The hardware components of the system include an Arduino platform, two ambient light sensors, two LilyPad
accelerometers, a flex sensor, and an ultrasonic range finder.

In order to make the system fully remixable and recyclable, the sensors are not soldered: they are connected to an
Arduino Proto Shield through headers to allow re-use, hacking and adaptation at anytime.
All sensor data are sent via a serial transmission to the Pure Data software, an open source visual programming
language that was used to filter the data coming from the Arduino and convert them into sounds. The software allows real time management of thresholds and volumes of the five instruments through a graphical user interface.

References:
Lund, H. H., Marti, P., & Tittarelli, M. (2014). Remixing playware. In Robot and Human
Interactive Communication, 2014 RO-MAN: The 23rd IEEE International Symposium on (pp. 49-55).
Tittarelli M., Marti P., and Peppoloni D., (2014), Rapping dyslexia: learning rhythm, rhyme and flow in dyslexic children, In Proc. of the 8th Nordic Conference on Human-Computer Interaction: Fun, Fast, Foundational
pp 865-870

The context of use

The system can be used in different contexts such as schools, rehabilitation center and playful environment.

Type of play in this play system

Social

Parallel
Associative
Cooperative

Objectives related to play according to ICF-CY

Play for the sake of play: Major life areas - d880 enagement in play

d8803 shared cooperative play
d8808 engagement in play, other specified
d8809 engagement in play, unspecified

Community social and civic life - d920 recreation and leisure time

d9200 play

Play-like activities: Therapeutic and educational objectives

b3 Voice and speech functions

Number of participants

1-5

Chronological Age

6-12 years

Development Age

6-12 years

LUDI Categories of disabilities

Communication disorders (speech and language disorders):

Explanation on the use of low-tech, high-tech devices, services or contexts

Explanation

Verbal instruction, language and communication fitting to chronological age

Involvement

Adult: therapist/educator/researcher

Role

Non-participatory observer

Evaluation of objectives and outcome measures

Description of outcome measure(s)

Observation by professional/researcher providing the play experience

Observation by other professional/researcher

Video analysis

Information about availability of outcome measure: publisher, website, contact person

Patrizia Marti: patrizia.marti@unisi.it
Iolanda Iacono: iolanda.iacono@gmail.com
Michele Tittarelli: michelearte@gmail.com

http://www.roboticsandlearning.org/?post_type=portfolio&p=314

Summary of achieved effects

The study conducted in Italy over a period of 1 month showed an incremental in relation to the fluency and the comparison of the verbal and non-verbal repetition test.

References to the intervention or research project

Patrizia Marti: patrizia.marti@unisi.it
Iolanda Iacono: iolanda.iacono@gmail.com
Michele Tittarelli: michelearte@gmail.com

Contact Person

Patrizia Marti: patrizia.marti@unisi.it
Iolanda Iacono: iolanda.iacono@gmail.com
Michele Tittarelli: michelearte@gmail.com

Website

http://www.roboticsandlearning.org/?post_type=portfolio&p=314

Publication

Tittarelli, M., Marti, P., Peppoloni, D. (2014). Rapping Dyslexia: Learning Rhythm, Rhyme and Flow in Dyslexic Children. Proceedings of the 8th Nordic Conference on Human-Computer Interaction, NordiCHI2014, Helsinki, Finland October 2014.

Lund, H.H., Marti, P., Tittarelli, M., Remixing Playware, Proceedings of The 23rd IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN 2014) Edinburgh, Scotland, UK 25-29 August 2014.

Keywords

Sound, sensors, play, playful activity, speech therapy, rap, dyslexia