??? Paper Title ???

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ABSTRACT

The abstract should preferably be between 100 and 200 words.

Author Keywords

sonification, ???

ACM Classification

H.5.5 [Information Interfaces and Presentation] Sound and Music Computing, H.5.2 [Information Interfaces and Presentation] User Interfaces—Haptic I/O, I.2.9 [Artificial Intelligence] Robotics—Propelling mechanisms. **??? TO DO**

1. INTRODUCTION

- motivation
  - challenges
  - the Vicon system

2. STATE OF THE ART

- Vicon & related projects
  - interactive / movement sonification examples[1].

3. PROJECT DESCRIPTION

3.1 Concept

- Performance aesthetic
  - Gestures, virtual objects, dynamic mapping
  - Visual environment

3.2 Implementation

- Character design (Nexus)
  - Vicon extensions (SDK plugin)

3.2.1 Max modules

- Objects generation & performance mechanics

In order to create interactive sounds, attractive grapichs and special effects, MAX creates a connection between virtual objects and subpatches[1]. Manipulating objects algorithm consists of 3 steps: object generation, finding the object and releasing the object on the floor. Object generation is performed by random generators, functioning within certain limits. These limitations are influenced by the dimensions of the room in which the Vicon system is installed. Finding the object supposes continuous mathematic relations between the coordinates of the object and coordinates of the selected marker. When these coordinates are close enough one to another, the object is retreived and manipulated by performer (eg. define gesture); After all these actions are completed, a simple comparison between the coordinates of the floor and the value of the z axes of the marker is done in order to put down the object.

- Gesture recognition

Interaction between sound control and human gesture has constantly increased over the last years [2]. Probabilistic models for analysing motion and sound relationships became a necessity and a forthcoming tool [3]. *Mubu* containers provided by Ircam laboratories in MAX/MSP software represents a handy tool to record and analyze gesture, captured with Vicon system [4]. Our gesture recognition algorythm is based on Hierarhical Hidden Markov Model implemented in *mubu.hhmm* object of MAX/MSP. Firstly, we train the system with captured data asociated with a gesture. This process requires a predefine indicator to delimitate gestures from all data flow. to be continued...

- Sound design
- Visualisation (jitter)

4. CASE STUDIES

4.1 Interactive Installation

4.2 Performance

- Solo / duet / tutti ...

5. CONCLUSIONS AND FUTURE WORK

- Areas of improvement
  - Eye tracking?

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[1] See `http://www.cycling74.com/`.

6. ACKNOWLEDGMENTS

This section is optional; it is a location for you to acknowledge grants, funding, editing assistance and what have you.

7. REFERENCES

[1] T. Hermann, A. Hunt, and J. G. Neuhoff. *The sonification handbook*. Logos Verlag Berlin, 2011.

[2] K. N. Jorge Solis. *Musical Robots and Interactive Multimodal Systems*. Springer-Verlag Berlin Heidelberg, Berlin, 2011.

[3] R. B. F. B. Jules Francoise, Norbert Schnell. Probabilistic models for designing motion and sound relationships. *International Conference on New Interfaces for Musical Expression*, pages 287–292, June 2014.

[4] D. S. G. P. R. B. Norbert Schnell, Axel Robel. Mubu and friends assembling tools. *International Computer Music Association*, pages 423–426, August 2009.