

Initial Plan

Motion Capture To MIDI

by
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CM0343 (40 Credits)

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The aim of the project is to use specialised hardware and software to capture human movements and gestures, recognise them, and to output a specific sound, or apply a specific sound-effect associated with that movement. My task will be to develop an appropriate user-friendly program that uses the data collected by the sensors to accomplish this task. The hardware is already available at the school.

Recently, the market and scope of hands free technologies such as the Xbox Kinect, and before that the Playstation Eye-Toy, have been growing rapidly. The Kinect allows users to progress through on-screen games with fairly advanced and specific movements of the body. Though my project differs in that the motion capture is not done with a camera, the idea of achieving an interactive goal, either on screen or through sound, is a very popular one. I hope to be able to emulate such technologies to a degree, and be able to output some interesting sounds and/or effects.

Objectives (by Interim Report) -

- Understand (to a good level) Hidden Markov Models (HMMs) and their applications
- Experiment with, and learn to use JAHMM – a Java implementation of HMM related algorithms – for future use.
- Communicate successfully with the existing hardware
- Undertake research of MIDI theory
- Have a working form of basic pattern-recognition
- Learn individual gestures one at a time, by repeating movements x number of times.
- Experiment to establish best environment/conditions/number of repetitions required to learn gestures.

By Final Report -

- Fully understand and integrate HMMs with the program
- Experiment with more advanced gestures
- Apply more interesting/advanced sounds/effects
- Have full control and a firm understanding of MIDI output
- Simplify screen output to end user
- Have enough functionality and results, to test and critically analyse the system

- Use system in conjunction with audio playback to provide “live” sound effects to an output stream. (This is an additional objective that will only be attempted if there is time)

At the end of week 3, I have completed background research of both HMMs and JAHMM. See attached PDF for a more detailed plan with specific dates and milestones. Spring semester goals have been completed to the best possible details available at present. Those specific dates depend on what is completed before Christmas, and how long certain aspects of the project will take to complete.