

Student Collaboration Program Bachelor Thesis, Language technology

Thesis Title

Sign Language Technology (working title)

Introduction

The goal of this thesis is to find a cost-efficient approach of implementing body language as a method for human-computer communication.

The task is to develop a limited sign language for use with an accelerometer to control a speech synthesizer. A Nintendo Wii™ remote control will be used as an accelerometer.

As well as evaluating the efficiency of the implemented sign language and technology when 1) used as a tool of communication and 2) when used in entertainment-based applications.

A prototype will be implemented in Java as a proof-of-concept

Method

The Nintendo Wii™ remote control contains an acceleration sensor that sends signals using Bluetooth. There are several open libraries for handling Bluetooth-signals received by a computer. To use an existing accelerometer commonly available of the shelf in electronic retailers, in combination with open libraries is necessary in order to make the resulting application cost-effective.

The prototype developed will interpret data from the remote control in the form of events, and generate data in the form of synthesized speech. The application will use a finite state machine implemented in SCXML to process the events.

Students

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Start date

March 31st, 2008

Expected thesis submission date

May 22nd, 2008

Time plan:

- Studies, 1 week
- Prototype development, 1 week
- Iterative development, 4 weeks
- Report writing, 1 week

Prior knowledge:

- Imperative programming (Java)
- Automata theory
- Description language (SCXML)
- Pragmatics
- Speech technology

Assets:

- Nintendo Wii Remote control
- Computer with a Bluetooth receiver

Literature:

- Wendy Sandler, Diane Lillo Martin: Sign language and linguistic universals
- Ian Horrocks: Constructing the User Interface with Statecharts
- Magnus Boman, Jussi Karlgren: Abstrakta maskiner och formella språk
- Commons State Chart XML, <http://commons.apache.org/scxml>
- WiiRemoteJ, <http://www.wiili.org/WiiremoteJ>

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