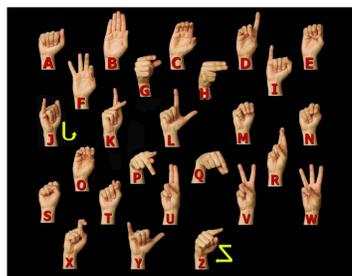


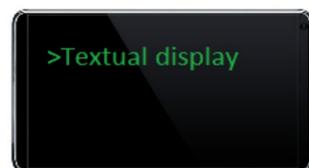
American Sign Language Interpreter From Gesture to Speech

Concept

Use computer based technologies to help mute people to understandable and independent by transforming sign language into voice.



The American Sign Language (ASL) is a well defined language composed of an alphabet, and an expanding set of words, each defined by finger and hands positions.



In some situation, text to speech software can produce weird output, so both textual and voice output have to be considered.

Existing solutions

Capture the gestures of the hands

•First person solution :

Position a device on the sign user like a camera on a hat, or gloves that record the position of the fingers and the palm of hands.



From the work of Pr. Thad Starner

•Second person solution :

Have an external camera record the gestures

Pros and Cons :

- Second person is not intrusive, the user doesn't have to wear any equipment while first person require the user to be equipped with some devices.
- The solution with gloves is more efficient considering there is no work in interpreting the video captures to get hands coordinate.



The acceleglove by Anthonix

- Video capture depends on exterior conditions (light, position of the user from the camera) while a solution with glove doesn't.
- Facial features are ignored with gloves while they can be tracked with video capture



The Shapehand by Measurand Inc.
Contains up to 40 sensors

Interpret this gestures

This is the most complex part :

Pattern recognition algorithms can be used to interpret the expressions of the hands.

In his work, Pr Thad Starner uses Hidden Markov Modeling.

Text to speech

That is the easy part. Various Text to speech already exist and are available online. Most of them are quite efficient.



Screen hot from the website : <http://text-to-speech.imtranslator.net/>

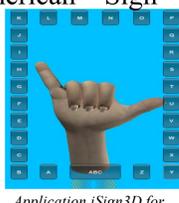
Other applications

Learn the American Sign Language

Applications already exist with some equipment like the acceleglove or the shapehand to learn the American Sign Language



Application to learn how to fingerprint using acceleglove



Application iSign3D for iPhone using Shapehand.

Use as a gaming controller

Some research has already been made to use such gloves as controller for games (e.g wii) or other computer application : like music or DJ applications.

Gesture Jam glove use by a team of the university of technology in Eindhoven for gaming applications



Home automation

It is easy to imagine a glove for disabled people that could control electronics devices and other systems in your house :

- Open doors
- Switch on/off lights on a room
- Turn on/off computer/TV/sound system
- Control all electronics (dishwasher – oven...)

Medical assistance

Electronics glove can be used to train and help medical staff.



The electronic CPR glove, used for assisting medical staff into CPR procedure. (control frequency and depth of compressions)