

Concepts for implementation

Facial expression tracking

- Face detection using Kinect

Available MATLAB programs

<http://www.mathworks.com/matlabcentral/fileexchange/29834-face-detection-using-support-vector-machine-svm>

- Various sets of facial expressions
- Feature extraction and tracking

<http://www.ics.uci.edu/~xzhu/face/> - MATLAB IMPLEMENTATION

ASM(Active shape model) Mesh Implementation

- Emotion mapping with datasets -Cascade classifier
- http://docs.opencv.org/trunk/doc/user_guide/ug_traincascade.html

Interaction using voice and sounds

- Techniques:

Template matching:

- Matching the voice information with available test datas
- Vulnerable to errors as speaker dependent

Feature analysis:

- Speaker independent
- Implemented using FT or LPC
- But prone to errors due to accent, speed, pitch

Implementation:

- Using CMUSphinx (Open source toolkit)

<http://cmusphinx.sourceforge.net/wiki/faq>

- Julius (Open source engine)

http://julius.sourceforge.jp/en_index.php

- Both can work under Linux & Windows
- Adding new languages possible

Data collection – VOX GL (speech library)

Model training

Testing

Eye tracking

- Active IR Lighting used
- **SVM (support vector method)** OpenCV library for object recognition
- Object tracking using **Meanshift** library with Kalman filter
- Object tracking using color probability & target location
- **CAMShift** for different color distribution
- **Haar Cascade** for eye detection and classification

Gesture control

- JavaCV implementation

<http://www.javacodegeeks.com/2012/12/hand-and-finger-detection-using-javacv.html>

- Various openCV implementation available
- **SVM implementation** – more accurate for gesture recognition
- Many javaCV codes available like

<http://softwarependula.blogspot.de/2013/03/face-and-hand-detection-using-javacv.html>