Facial Recognition Device

Tom Stefanyk
Alex Newcomb
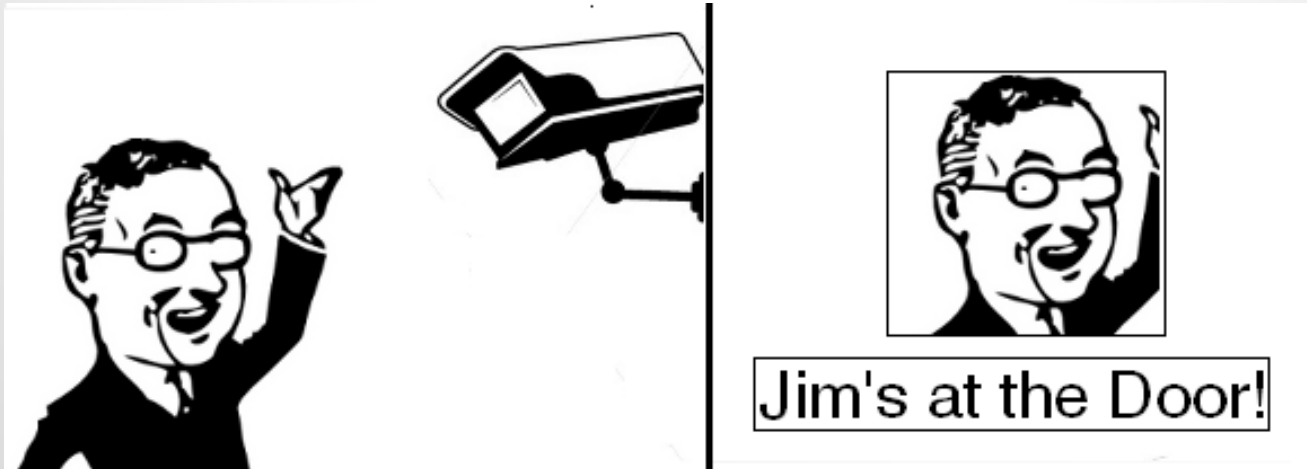
Motivation

- Security issues
- Access control
- Identifying person at the door

Requirements

- Video input
- Frame buffer
- Facial recognition algorithm
- Easily accessible interface

Jim's at the Door!

Video input

- TV Decoder outputs interlaced YCbCr 4:2:2
- Requires 16-bit RGB, 8-bit greyscale
- Video-in example takes care of conversion, FSM stores pixel data in SRAM

OpenCV library

- BSD-licenced library containing many useful functions dealing with visual input
- Requires large amount of data, stack and heap space, therefore moved to laptop
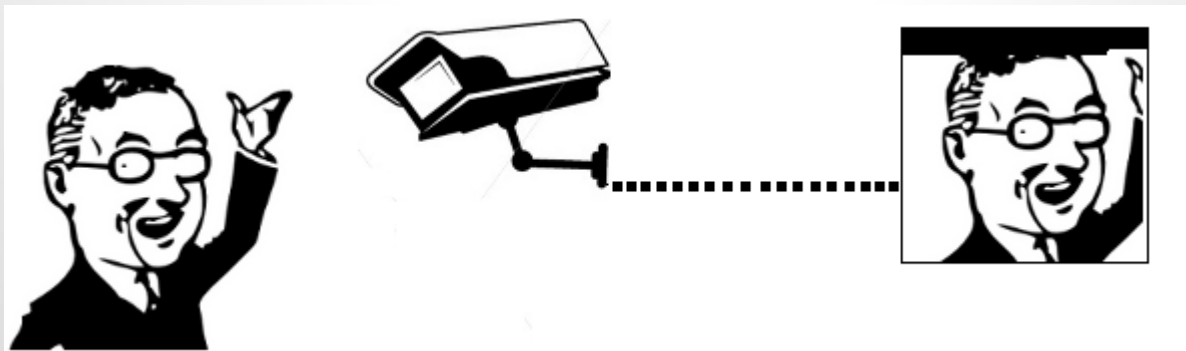
Display

- Web based display for high compatibility
- Specialized web-server
- Display Name
- Automatic asynchronous update
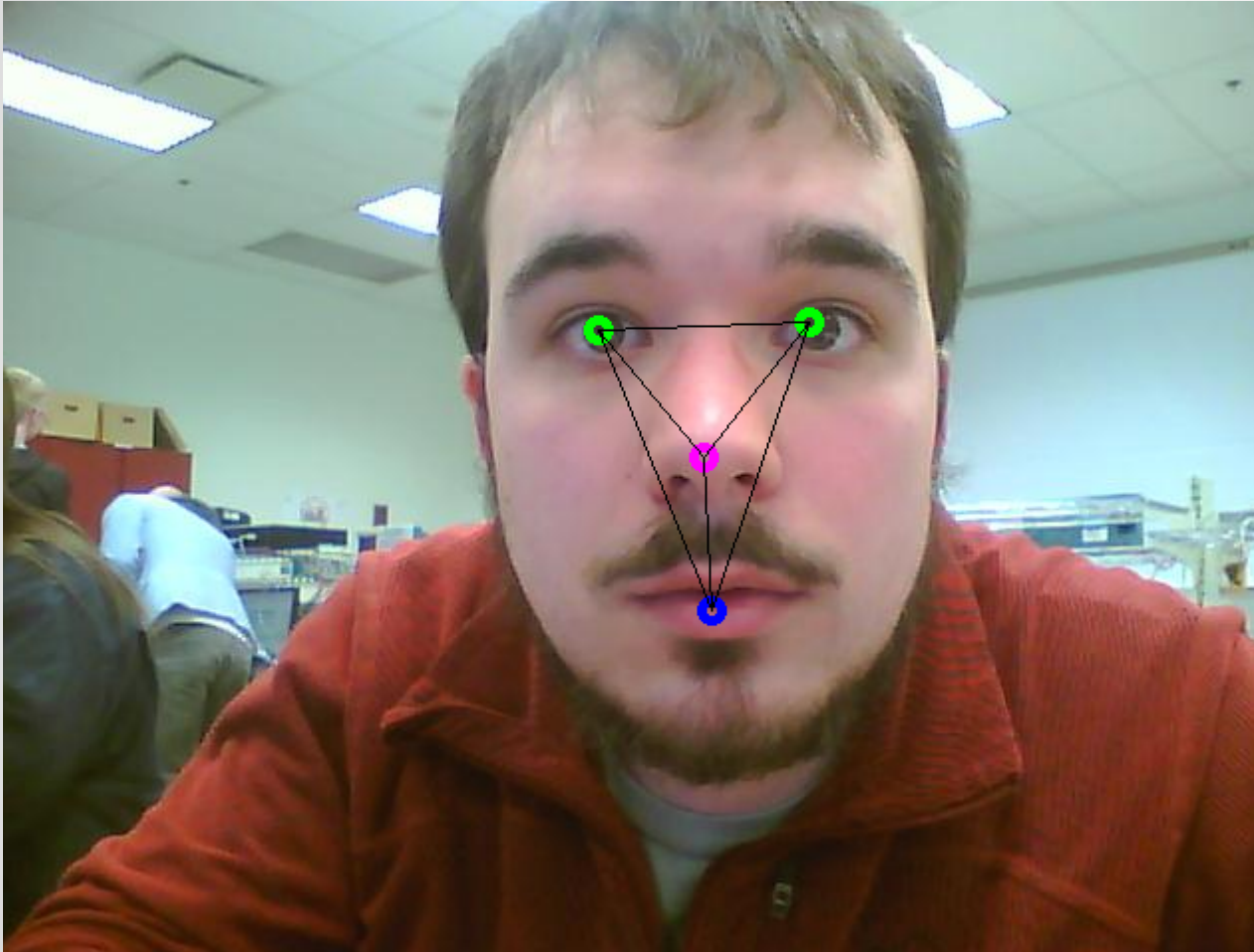
Image Transmission

- No writable file system
- Need to construct BMP (little-endian, inverted pixel order) from frame buffer
- Also need to allow for color and greyscale (for testing purposes)
- Solution: send 1 pixel at a time

Recognition

- Measure facial features

- 6 measurements give reasonable uniqueness

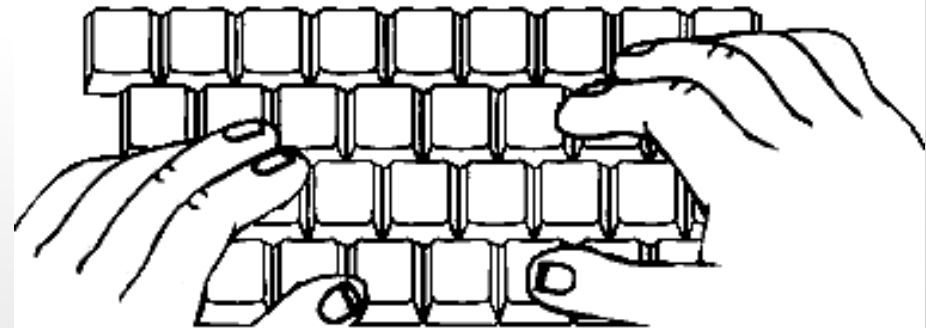- Database of known measurements

Face detection in action

Update

- User can set name to face
- Simple web interface
- Store in database

Demo

- System recognizes face

- Recognizes person from database

- Display face & name

- User selects action

- If unknown, prompt user for name

Next Steps

- Sound clip from web-server to alert user

- JPEG image compression

- Interface with door-lock system

- Audio streaming for communication

- Video streaming

Thank you

Questions?