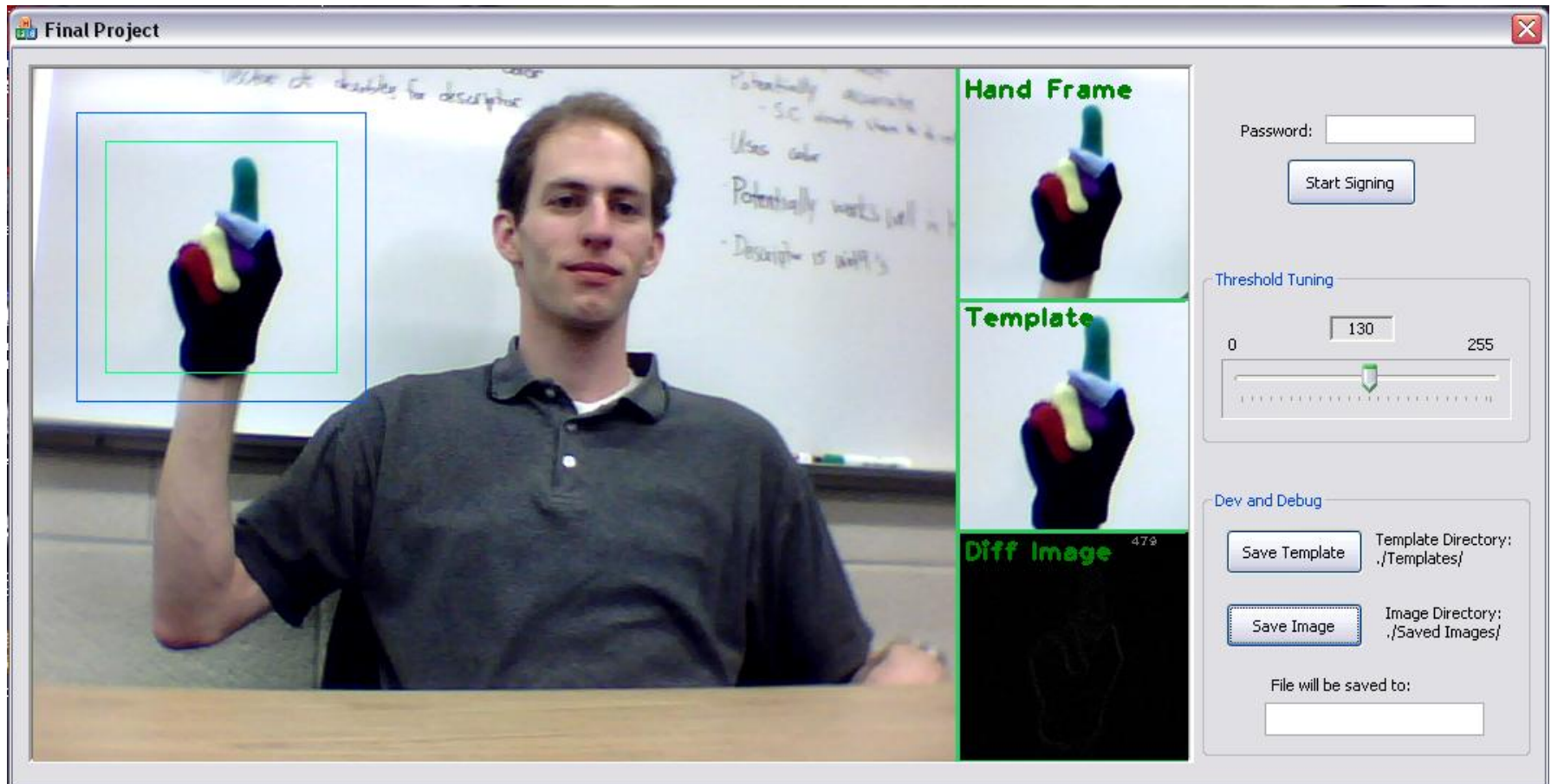# A Visual Password Recognition Application Based On American Sign Language

Wei Dang
Kevin Ellsworth
Cory Shirts
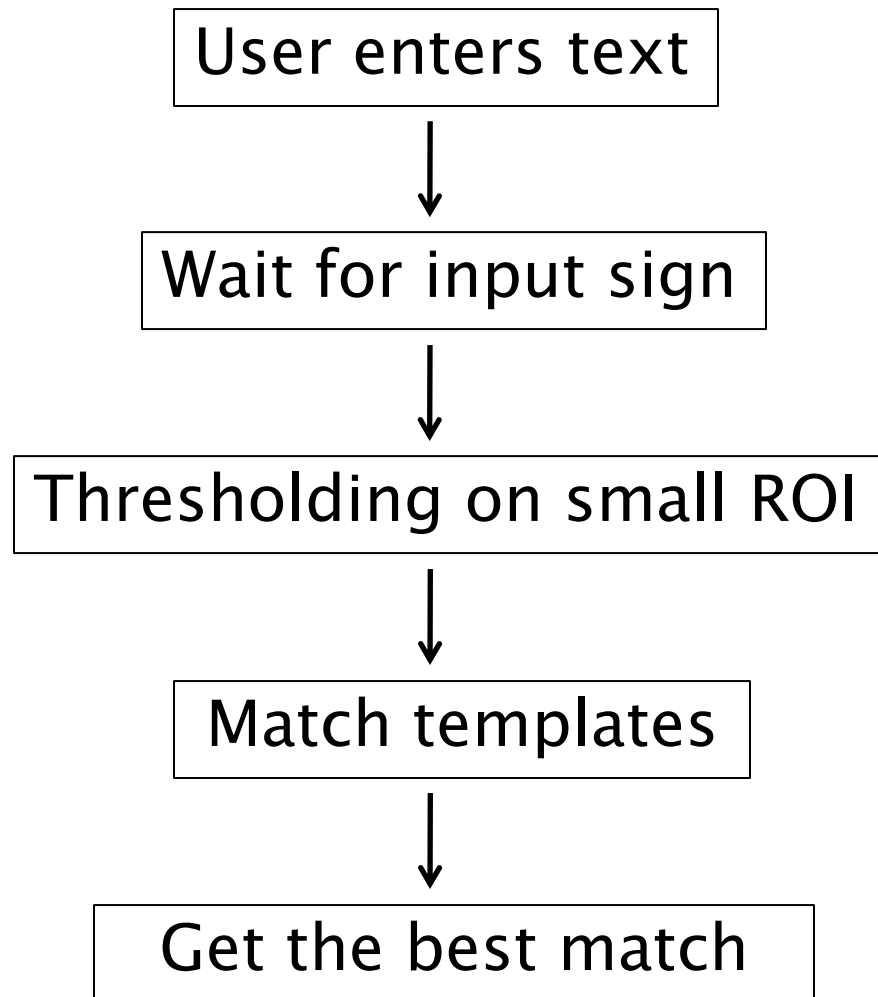
# Overview

- Goal: have a user interface to allow user text input using sign language digits and letters
  - User interface

  - Development of the algorithm

  - Demonstration

# The User Interface

# Initial Algorithm

User enters text

↓

Wait for input sign

↓

Thresholding on small ROI

↓

Match templates

↓

Get the best match

# Problems

▸ Similar signs not distinguishable with b/w template matching

Zero           Letter o 

▸ Some min/max values just too close to tell

▸ Digits worked alright by themselves
  ◦ Most problems introduced when including letters

# Adjustments

- Shape matching
  - Contour based algorithm (B&W)
  - No accuracy improvement over threshold template
- Template matching with color markers
  - Takes longer to process
  - Not perfect, but more accurate
- Template matching with saturation channels
  - Faster, but less accurate than full color
- Histogram comparison
  - Not accurate, but could be useful along with other techniques

# Final algorithm

▸ Template matching on color image

▸ Context checking for similar signs
  ◦ Some signs are the same for two characters
  ◦ Removed some templates for speed up

▸ Distinct hand positions
  ◦ Make difference between similar signs more distinct

# Future Adjustments

- Improve speed by matching on single channel
  - Saturation of HSV
  - Possibly other color space channel

- Could try training with Haar training method

- Averaging across templates or multiple methods

# Any questions?