



# Sign Language Interpreter

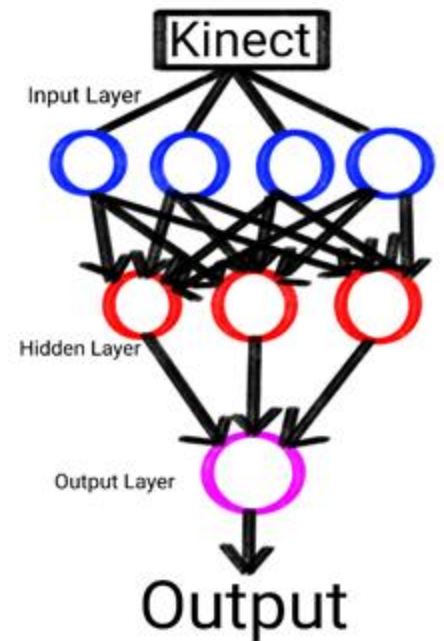
David Clairmont,  
Johnny Doan, Jack Gaither,  
Nick Hester, Sam Witucki

# Purpose

- Provide a learning application to those needing and wanting to learn ASL
  - 250,000 – 500,000 rely on ASL because of their disability
  - People who rely on ASL to communicate with disabled people
  - Interactivity helps build retention of learning ASL
- Provide better accessibility to learning ASL
  - Generally learned in-person through universities, clubs/organizations of deaf communities, etc.
  - Not everyone can have access to these resources
  - Application makes it more accessible and affordable

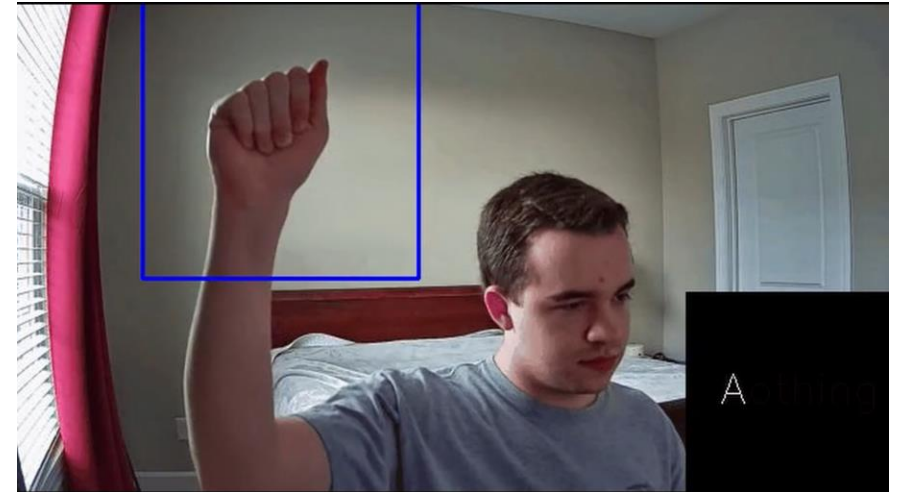
# Design Process – Initial Process

- Xbox Kinect
  - Receive live video of the person
  - Convert into input before outputting the information back to the user
- Issues
  - Difficulties obtaining the Kinects
  - Issues with different operating systems and creating virtual environments



# Design Process – Final Design

- Hand frame
  - 200x200 pixel blue input box
  - Couldn't interpret whole frame, wouldn't be accurate
  - Also couldn't detect where hand was in the frame, that would be 2 layers of interpretation
- Prediction frame
  - Area in lower right-hand corner
  - Prints model prediction to the screen



# Implementation

- Used PyTorch
  - Package for Python used for different machine learning projects
- Found dataset with what we wanted online
  - Lots of data, varied data
- Trained model using online dataset
  - Somewhat accurate, but not enough

# Implementation – cont.

- Made changes to training and model
  - Was never able to produce more accurate model this way
- Modified online dataset
  - Didn't improve accuracy
- Used our own dataset
  - Made using images of us signing
  - Wasn't more accurate

# Implementation – cont.

- Combined datasets
  - Combined our dataset and online dataset
  - Success!



# Demo





# Lessons Learned

- Don't use old, unsupported, and propriety hardware/software
  - For us, just wasted time and added complexity
- Don't waste time on peripheral features
  - Develop and polish critical features first

# Conclusion

- We created a program that (mostly) interprets the ASL alphabet
- Future works
  - Add more words/phrases
  - Allow for non-static signs
  - Tutorial section