
Image Classification of ASL Alphabets

Motivation

- ASL (American Sign Language) is expressed by movements of hands and face used by the deaf, hard of hearing and hearing nonverbal communities
- Deaf students are considered as a linguistic minority
- National shortage of sign language interpreters in the United States. 19 % growth in jobs by 2028

Solution

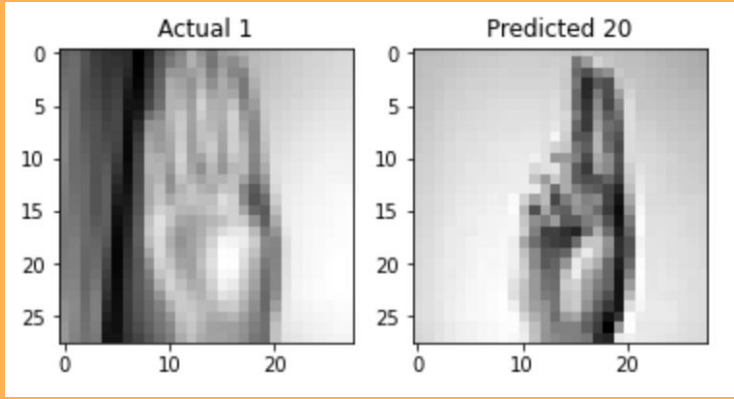
Build a deep learning algorithm that can translate American Sign Language into English

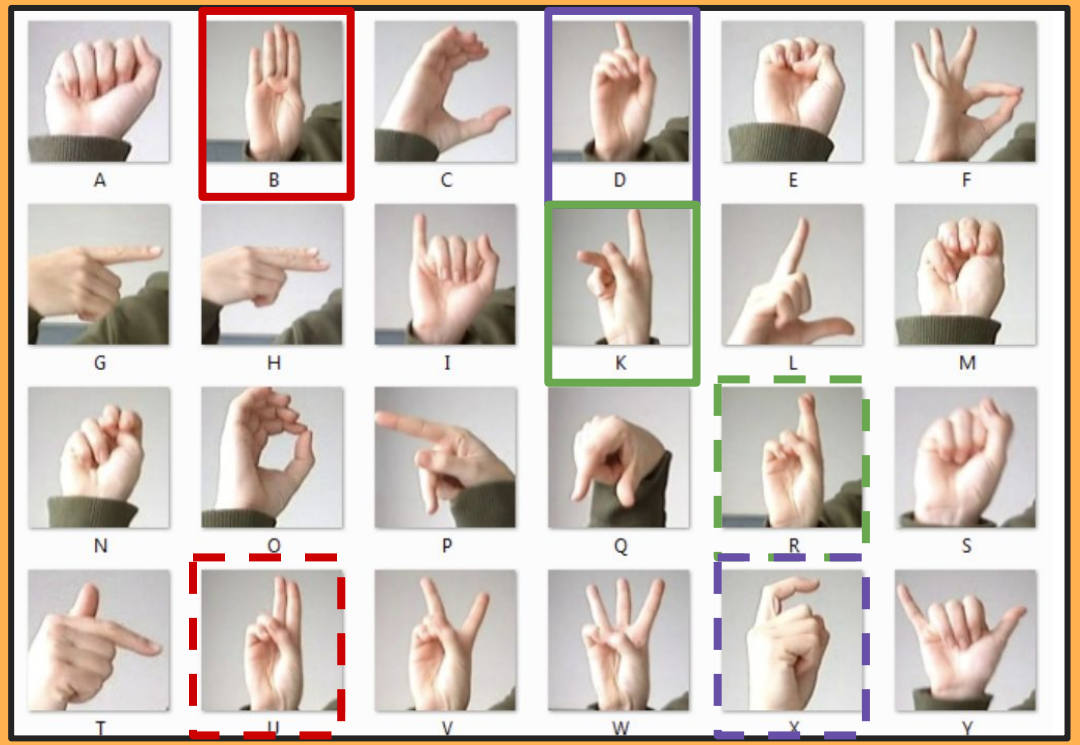
Data

- Kaggle
  - Image information for each alphabet in sign language
  - Training/test data: 27000/7000 images and 784 columns of pixel info
- Classes
  - 25 alphabets and balanced

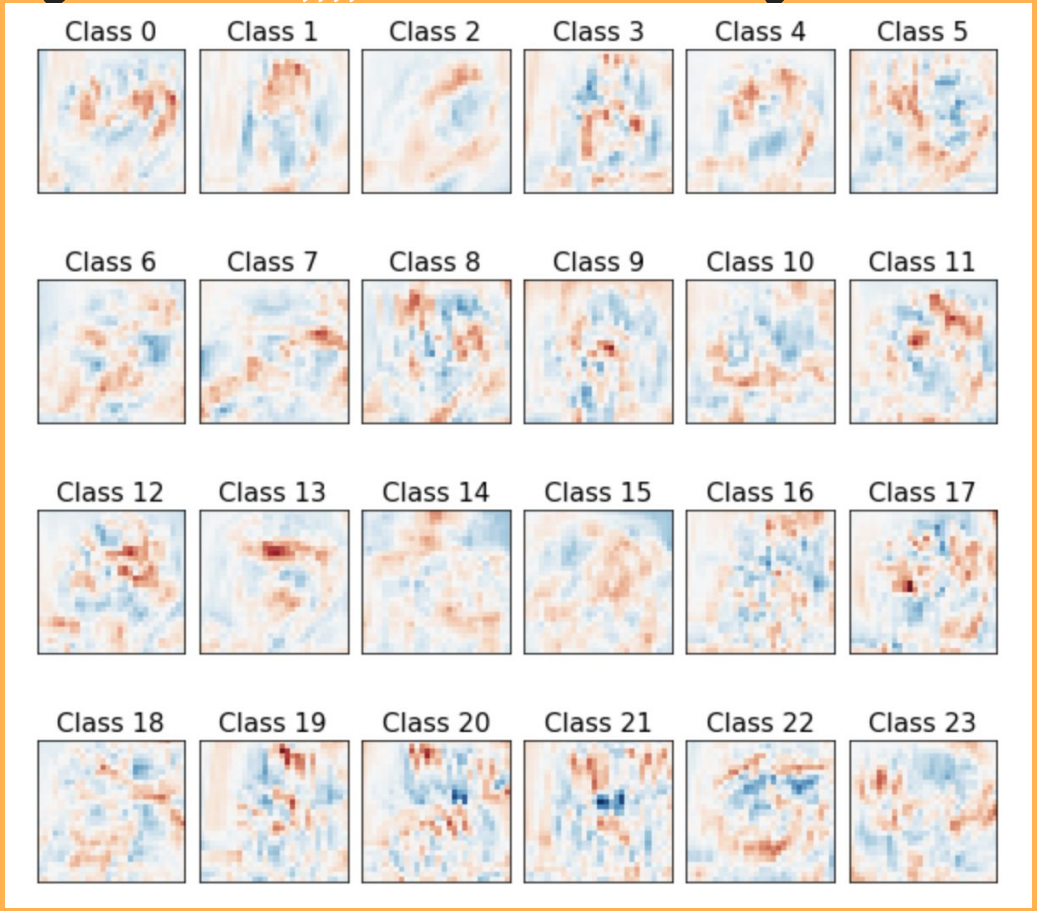
Logistic Regression

Accuracy	0.70



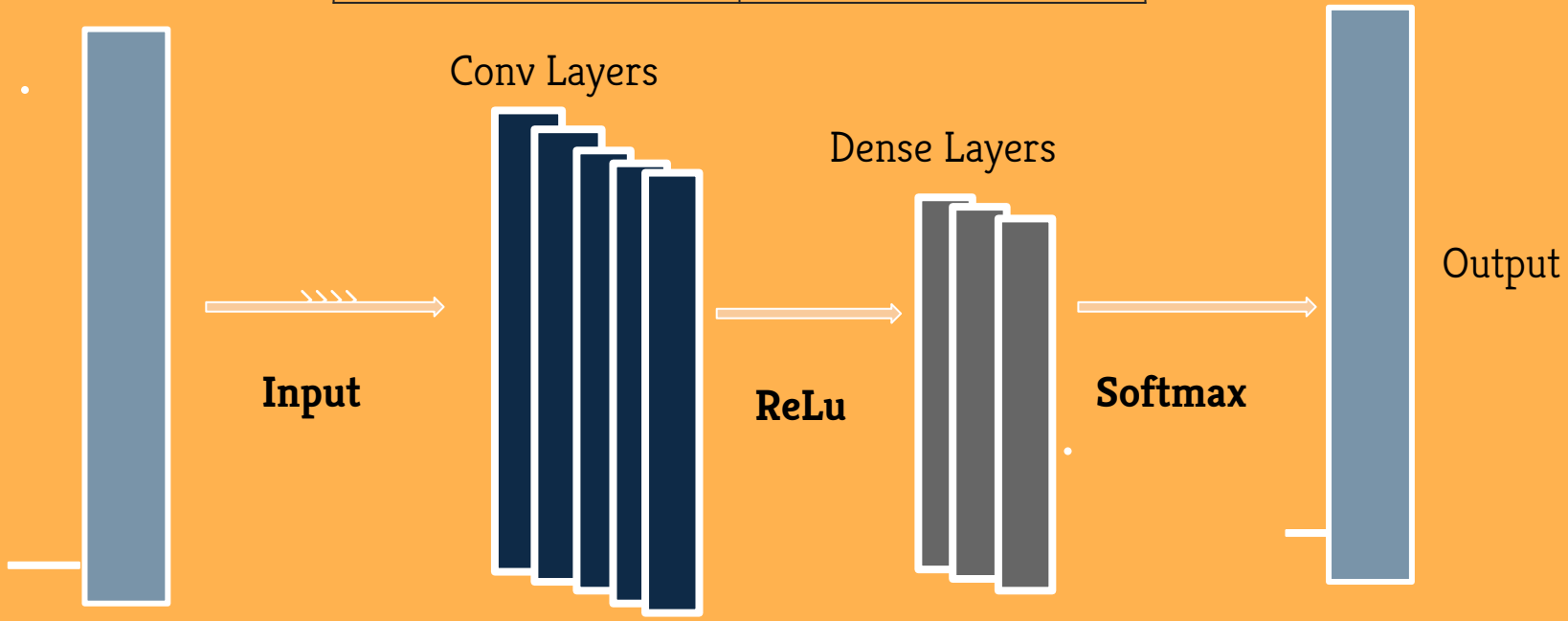


Logistic Feature Importance

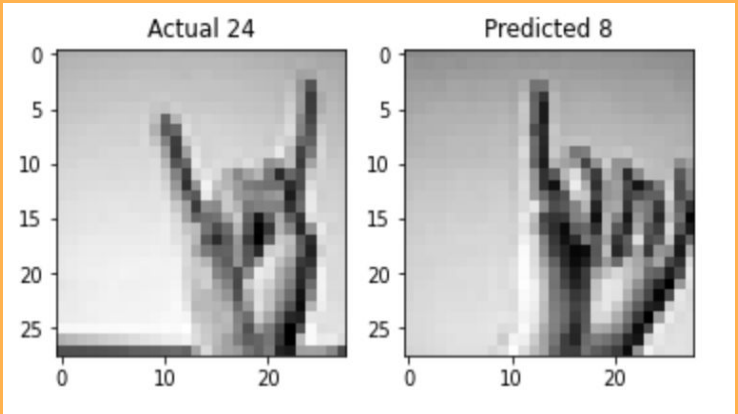


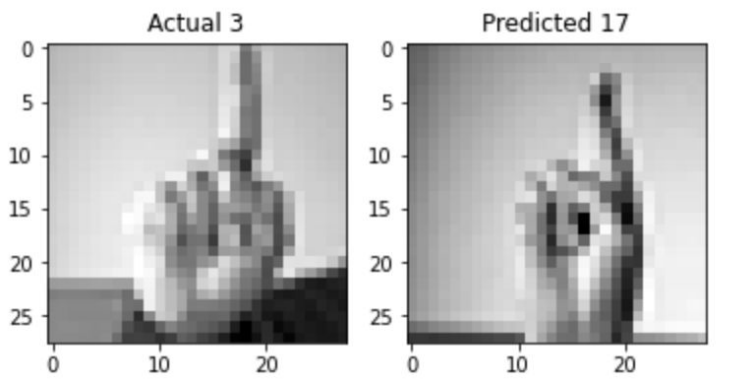
Convolutional Neural Net

Accuracy	0.97



CNN Evaluation





Convolutional Neural Net with transfer learning

Accuracy	0.87

Imagenet

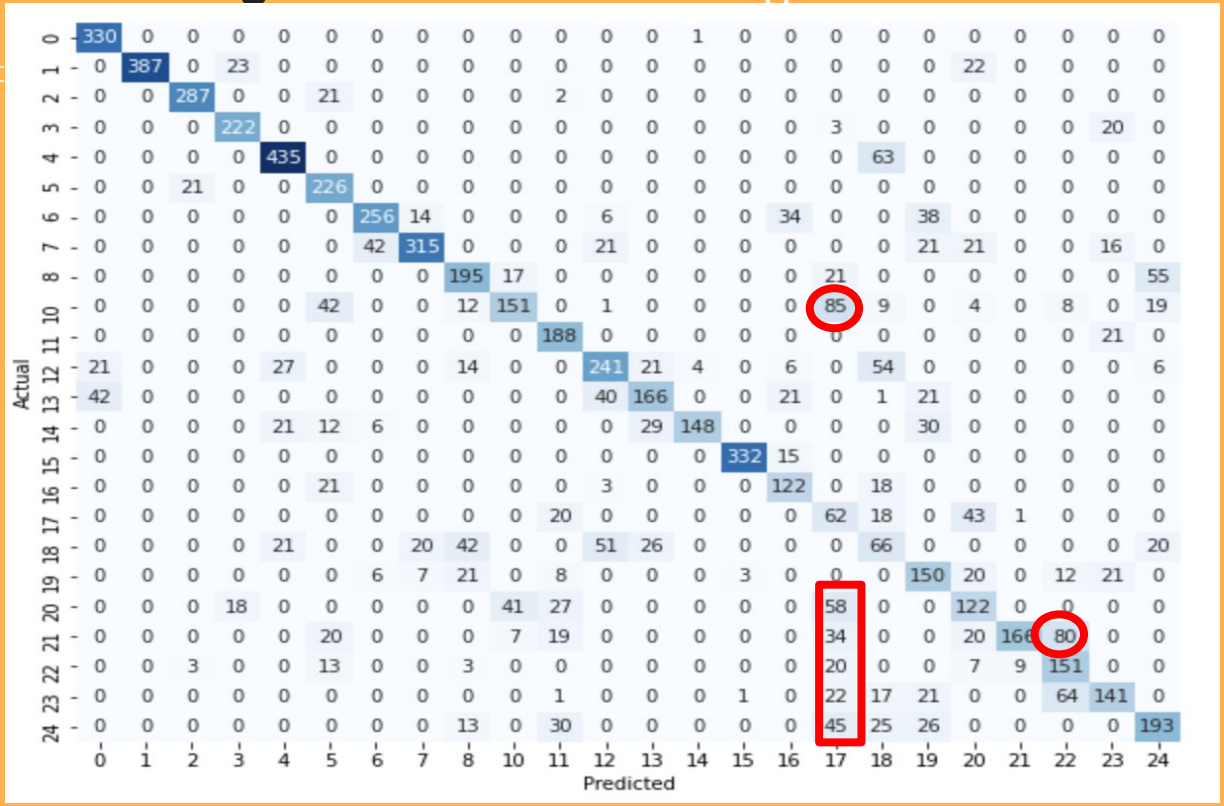
Future Work

- Add more image data for alphabets
- Include ASL hand gestures such as numbers
- Deploy the model using Flask

Thank you

Appendix 1
Alphabets with numbers

Appendix 2
Logistic Regression Confusion Matrix



Appendix 3
Neural Network Confusion Matrix