Kaggle's Sign language MNIST Dataset

J & K not included

Normalize data

Conv – BatchNorm – pool -> conv...

Use of OpenCV

Capture frame, output frame & bounding box

```
cap = cv2.VideoCapture(url)
_, frame = cap.read()
h, w, c = frame.shape
```

MediaPipe pre-trained networks to create bounding box

```
mp_hands = mp.solutions.hands
hands = mp_hands.Hands()
mp_drawing = mp.solutions.drawing_utils

cap = cv2.VideoCapture(url)
ret, frame = cap.read()
rgbFrame = cv2.cvtColor(frame, cv2.COLOR_BGR2RGB)
results = hands.process(rgbframe)
hands_landmarks = results.multi_hand_landmarks
```

Create outer box:

for landmarks in hands_landmarks

x_min = w
x_max = 0
y_min = h
y_max = 0
for landmarks in landmarks:

x, y
Create box if out of bounds

=> format to input of the model

Color frame

x_min, x_max
y_min, y_max
Resize image

Use a variety of datasets

Add noise & differentiate instances

```
mp_hands = mp.solutions.hands

hands = mp_hands.Hands()

mp_drawing = mp.solutions.drawing_utils

cap = cv2.VideoCapture(...)

    frame = ...

    h, w, c = frame.shape


while True loop

    ...

    results = hands.process(frame_rgb)

    if hand_landmarks:

        ...
```

Data training is diverse, normalize our test images as much as possible