# CS655 GENI Mini Project: Image Recognition Application

Implement an image-recognition service which has a web interface, where a user should be able to submit an image query and the service should use any of image recognition techniques, e.g., Squeeze Net, Google Net or any deep learning neural network which classifies the image and returns the answer to the user. You don't need to worry about training the neural network and can use pre-trained weights. The web interface and the recognition systems should be on separate nodes, and you should connect them using socket programming or rest API

# Demo

Web: http://204.102.244.64:9999/
Video: https://drive.google.com/file/d/1gJfjk1X9V8kKAjiHisEQVXsFmqxy_eeO/view?usp=share_link

# Design

## 1. Define message format

> < Protocol Type > [ < SPACE >< Data >< SPACE >< Checksum > ]

Protocol Type:

- 'D': Data message, include < Data > and < Checksum >
- 'A': ACK message, exclude < Data > and < Checksum >
- 'N': NACK message, exclude < Data > and < Checksum >

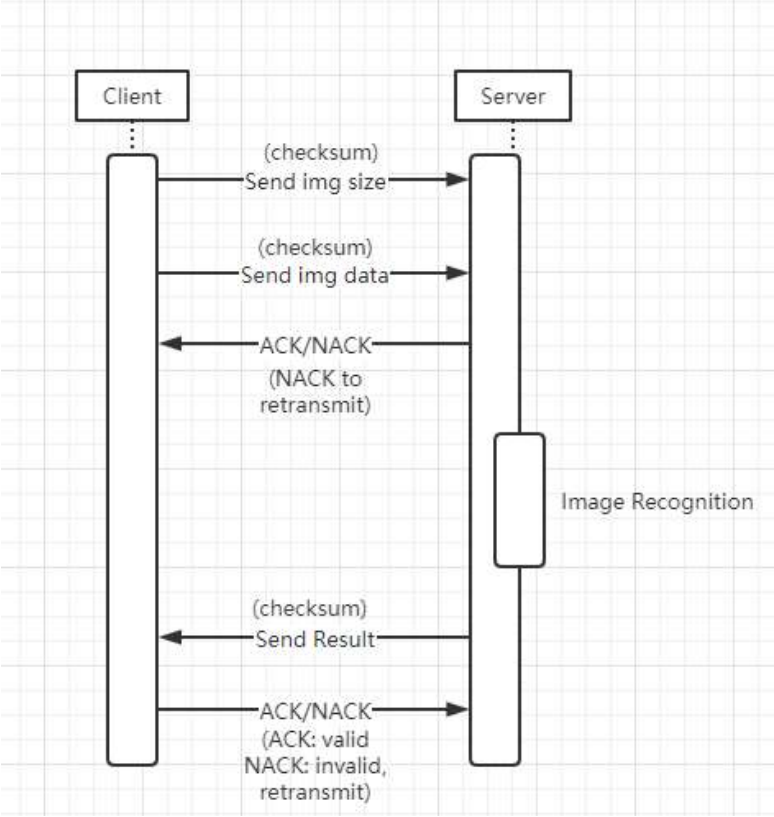
Data:

- Payload to send md5 hash or cracked password

Checksum: (5 bytes: 4 bytes checksum + 1 byte sign)

- Checksum of data

## 2. Define socket protocol to transfer image data and result.




## 3. Image recognition model

Used Squeeze Net to do image recognition. The pretrained model is part of pytorch.
Reference: SQUEEZENET

## 3. Implement socket code for server and client

Python socket program.

`clientsocket.py`

Read image, send image size and data to server

`serversocket.py`

Use multi-thread to handle connection. Receive image, image recognize and return result.

## 4. Deploy GUI with Flask

Html templates: `templates/index.html`
Flask code: `client.py`

# Requirement

## server

```
# install pip3 first
sudo apt update
```

```
sudo apt install python3-pip

# prerequisite for Pillow
sudo apt install libjpeg-dev zlib1g-dev
# install python package
sudo pip3 install torch torchvision torchaudio --extra-index-url https://download.pytorch.org/whl/cpu
```

### client

```
# install pip3 first
sudo apt update
sudo apt install python3-pip

# install python package
sudo pip3 install Flask
```

## Run

### server

Replace SERVERIP, PORT with your setting

```
# run code in terminal
python3 serversocket.py SERVERIP PORT
# or run code at background
nohup python3 serversocket.py SERVERIP PORT > /dev/null 2>&1 &
```

### client

Replace SERVERIP, PORT with your setting

```
# run code in terminal
python3 client.py SERVERIP PORT
# or run code at background
nohup python3 client.py SERVERIP PORT > /dev/null 2>&1 &
```