IMAGE RECOGNITION

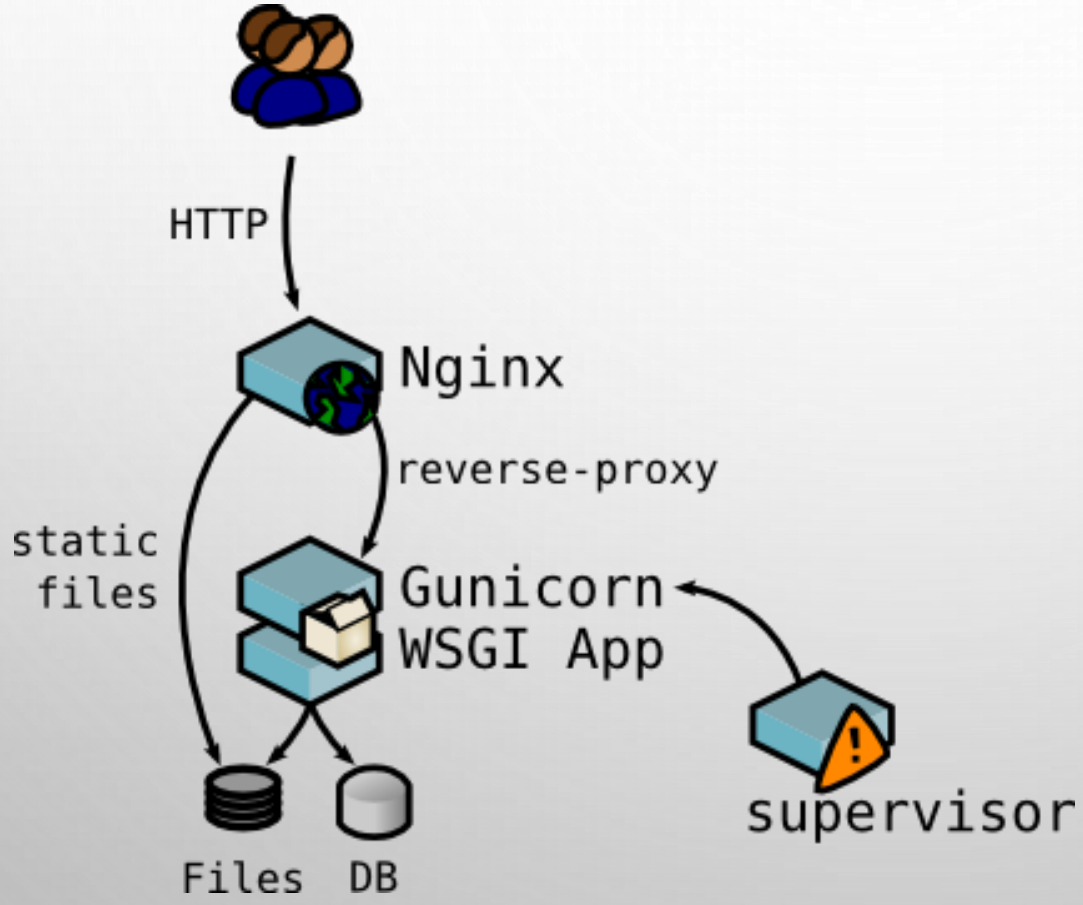
ON PRETRAINED MOBILENET_V2 MODEL

PENG LUO

TECH SELECTION

- BACKEND LANGUAGE: PYTHON
- FRAMEWORK: FLASK
- WEB SERVER NGINX
- HIGH PERFORMANCE WSGI SERVER: GUNICORN + GEVENT
- DATABASE: MONGODB
- API DOCUMENTATION: SWAGGER
- MACHINE LEARNING MODEL: MOBILENET_V2
- DEPLOYED ON: ALIYUN

SYSTEM STRUCTURE AND DATA FLOW



Ideally will be like what image shows

WHY NGINX?

- HIGH PERFORMANCE WEB SERVER
- REVERSE PROXY
- LOAD BALANCER
- STATIC FILES
- …

WHY GUNICORN + GEVENT?

- HIGH PERFORMANCE
- MULTIPROCESSING SUPPORT
- HTTP TO WSGI
- COROUTINE

WHY MONGODB?

- KEY-VALUE NOSQL : SUITABLE FOR THE SCENARIO
- HIGH PERFORMANCE
- EASY TO USE

DOCKER?

Dependency management
Easier for deployment
Improve scalability

```
Successfully built 0b2ac62bc9a6
Successfully tagged ml-apple:latest
'ml-apple Dockerfile: Dockerfile' has been deployed successfully.
```

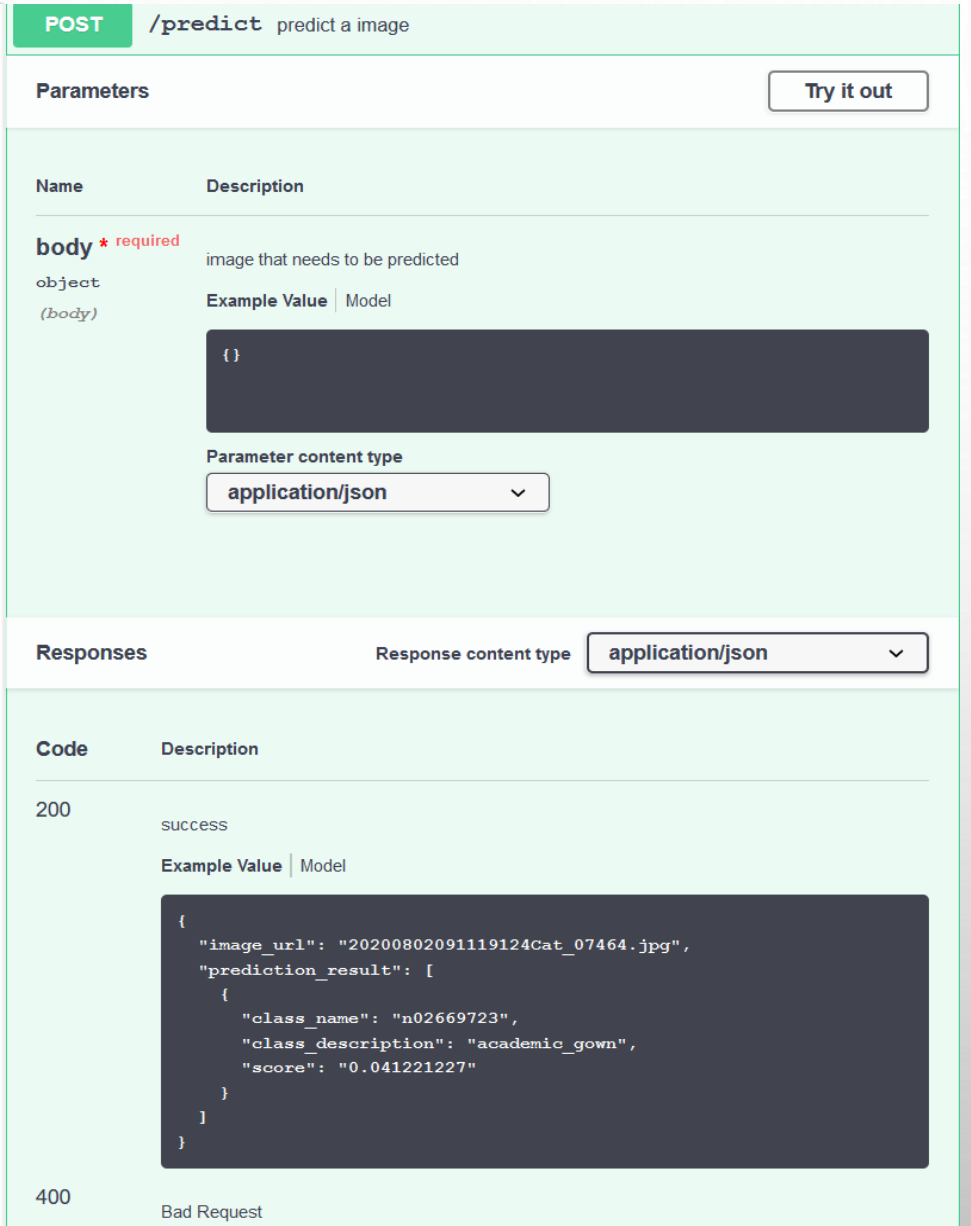
```
PS D:\develop> docker ps
CONTAINER ID        IMAGE               COMMAND                  CREATED             STATUS              PORTS                     NAMES
3bc1076979b3        ml-apple            "gunicorn image_serv…"   5 seconds ago       Up 5 seconds        0.0.0.0:8080->80/tcp      docker_ml_apple
f3b70a8486e8        mongo               "docker-entrypoint.s…"   4 hours ago         Up 4 hours          0.0.0.0:27017->27017/tcp  docker_mongodb
```

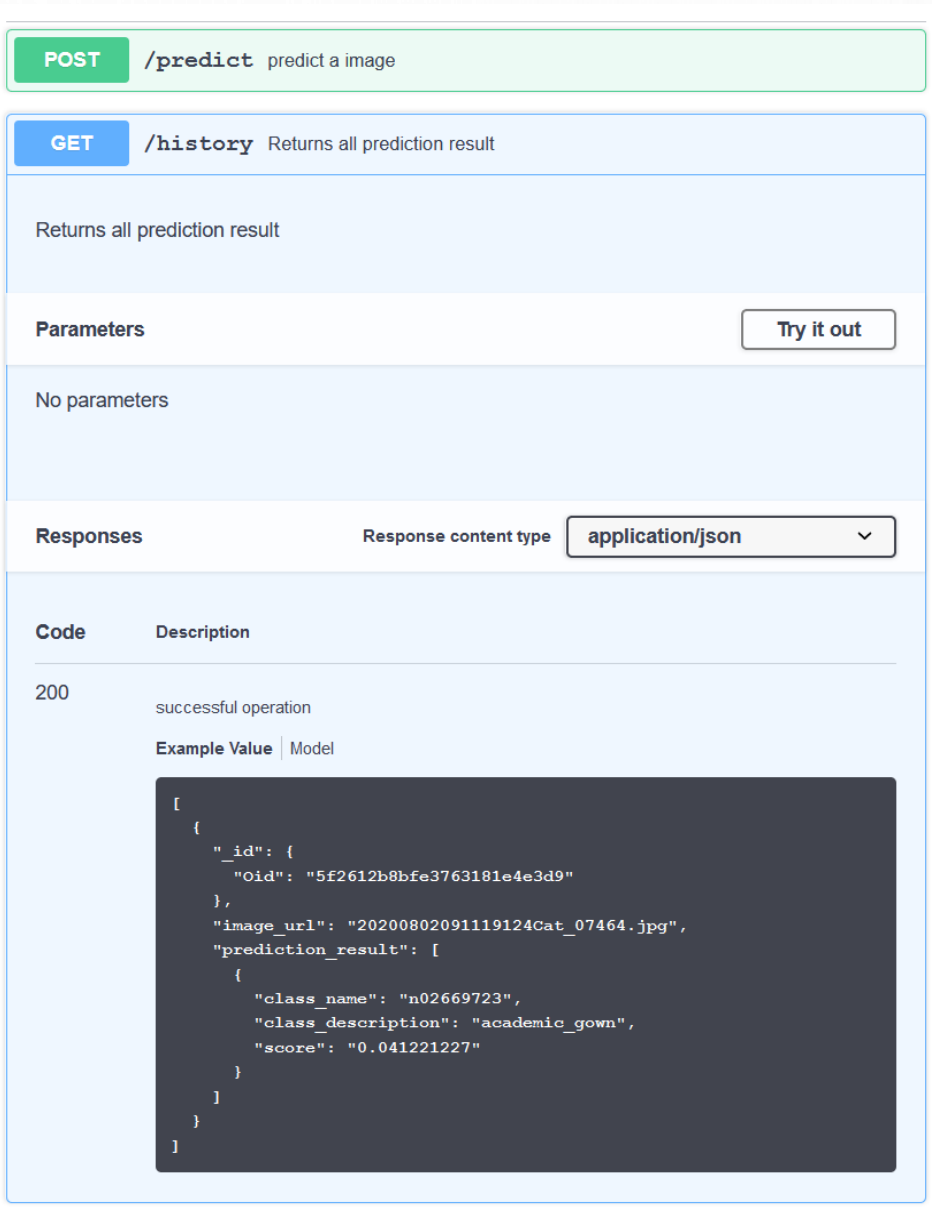
DEMO

- HISTORY ENDPOINT: GET http://106.14.46.83/

- PREDICTION ENDPOINT: POST curl -k -X POST -F "image=@human.jpg" "http://106.14.46.83/predict"

SWAGGER DOCUMENTATION





LIMITATIONS

- SECURITY DESIGN = NONE
- PERFORMANCE WONT BE SO GOOD SINCE EVERY IMAGE WILL BE STORED FOR DISPLAYING ON “HISTORY” WEBSITE.
- DEALING A SINGLE IMAGE AT A TIME WHILE KERAS MODEL CAN BATCH IMAGES
- ALIYUN SERVER IS FREE SO ITS PERFORMANCE IS POOR

HOW IT CAN BE IMPROVED

- REDIS AS QUEUE/MESSAGE BROKER PUT IN BETWEEN ML MODEL AND PREDICTION REQUESTS
- DON'T STORE ACTUAL IMAGE TO REDUCE DISK IO FOR BETTER PERFORMANCE
- SUPERVISOR FOR BETTER MONITORING

Q&A?

THANK U FOR WATCHING!