NVIDIA Korea DL Day 2016 Hands on Session

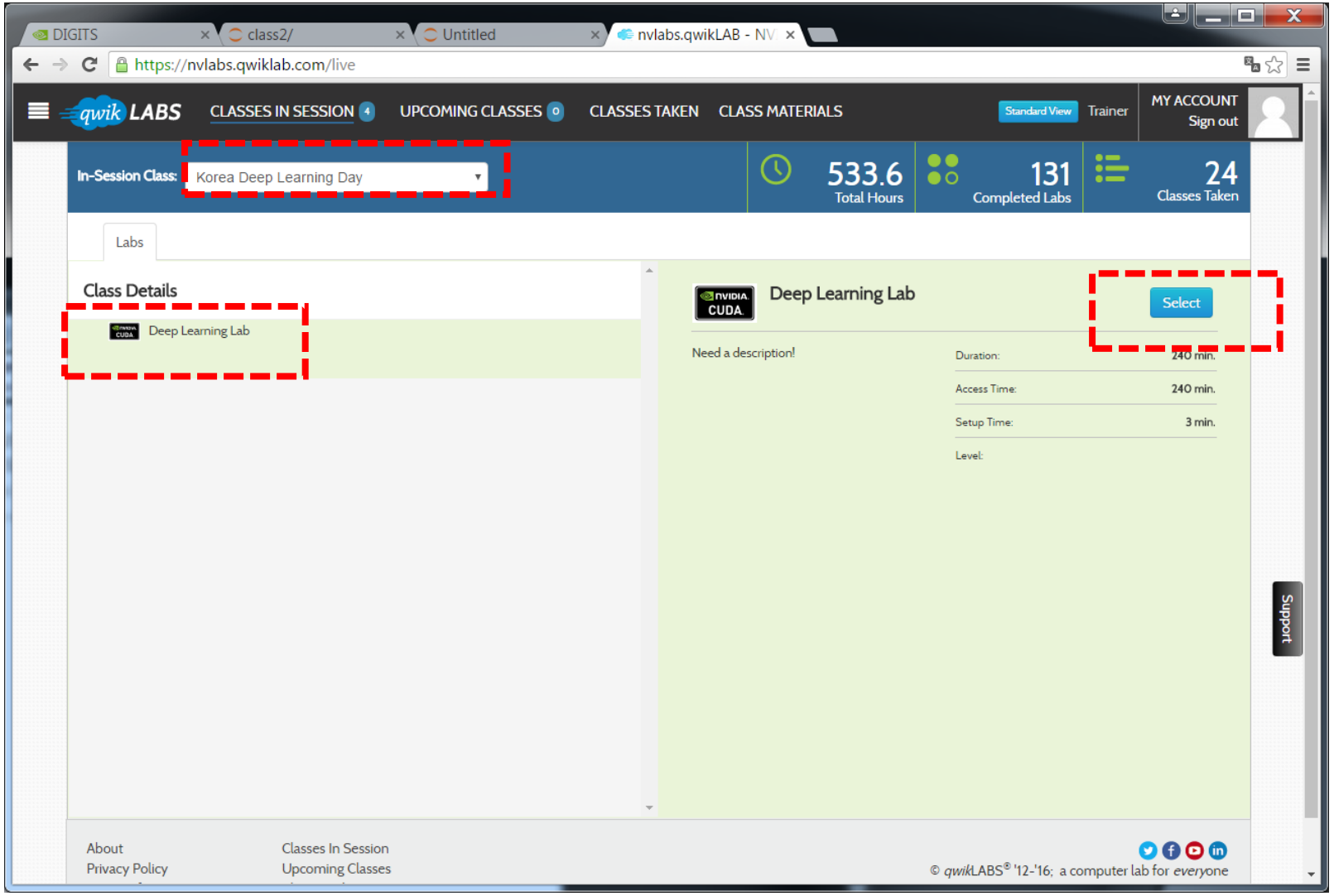
Hyungon Ryu | Solution Architect

hryu@nvidia.com

QWIKLAB

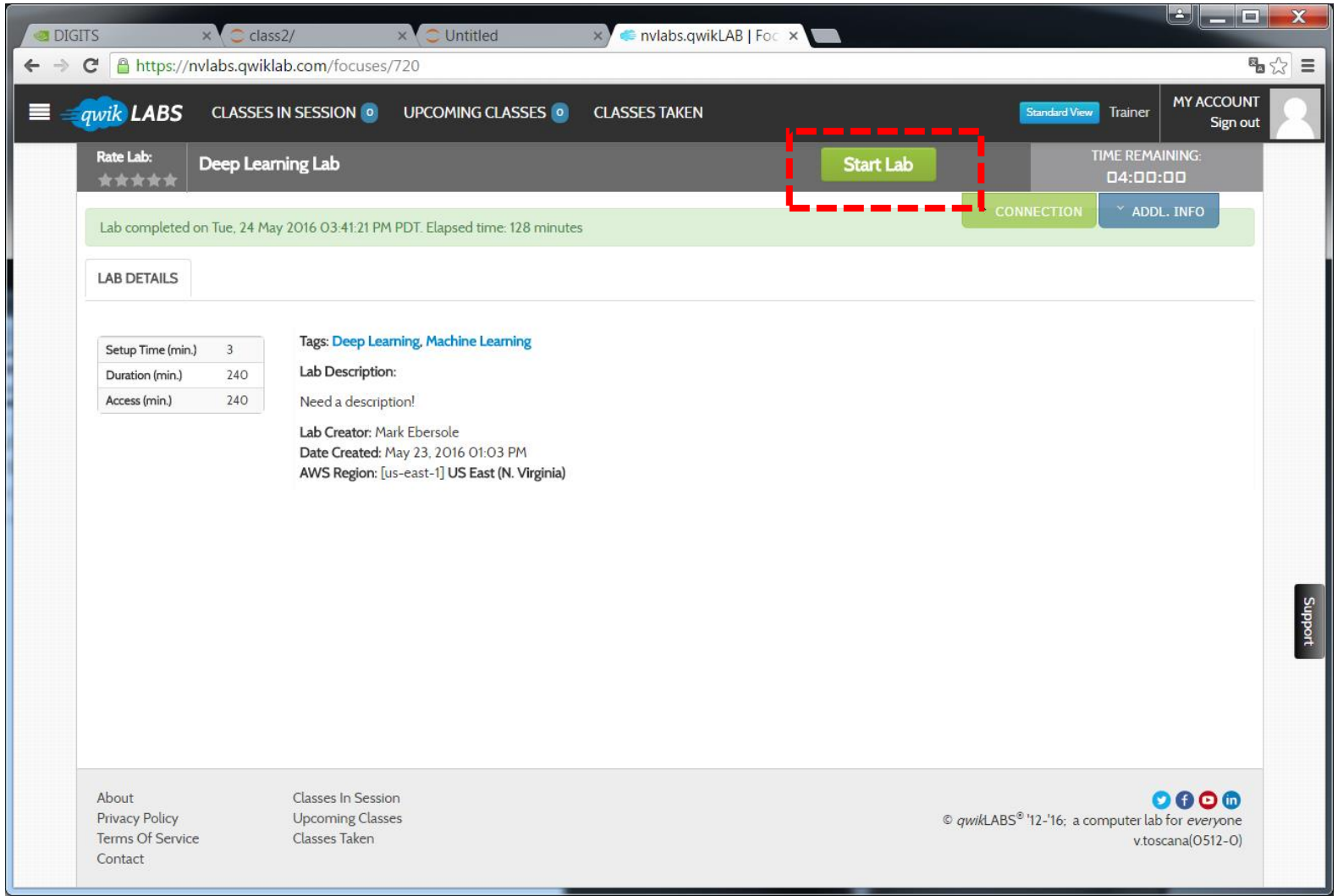
Sep1.

Step2.



Step3.

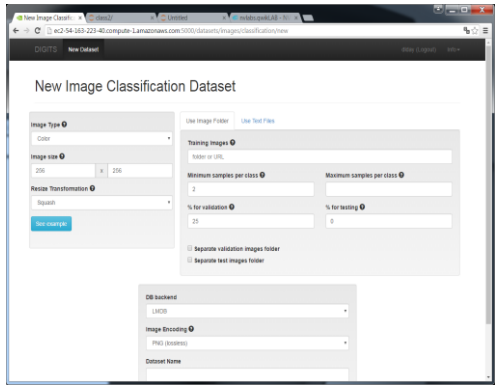
QWIKLAB



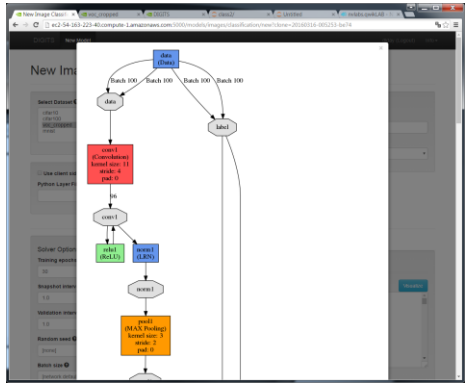
Start Lab

DIGITS workflow

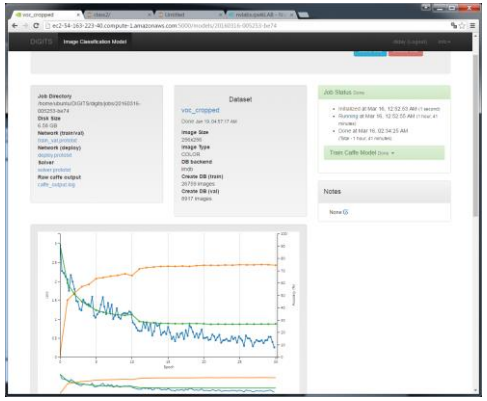
STEP1
Prepare Dataset



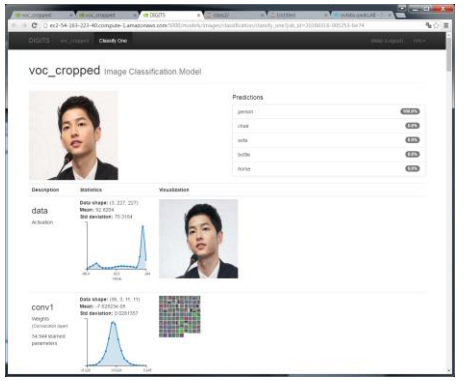
STEP2
Prepare DL Model



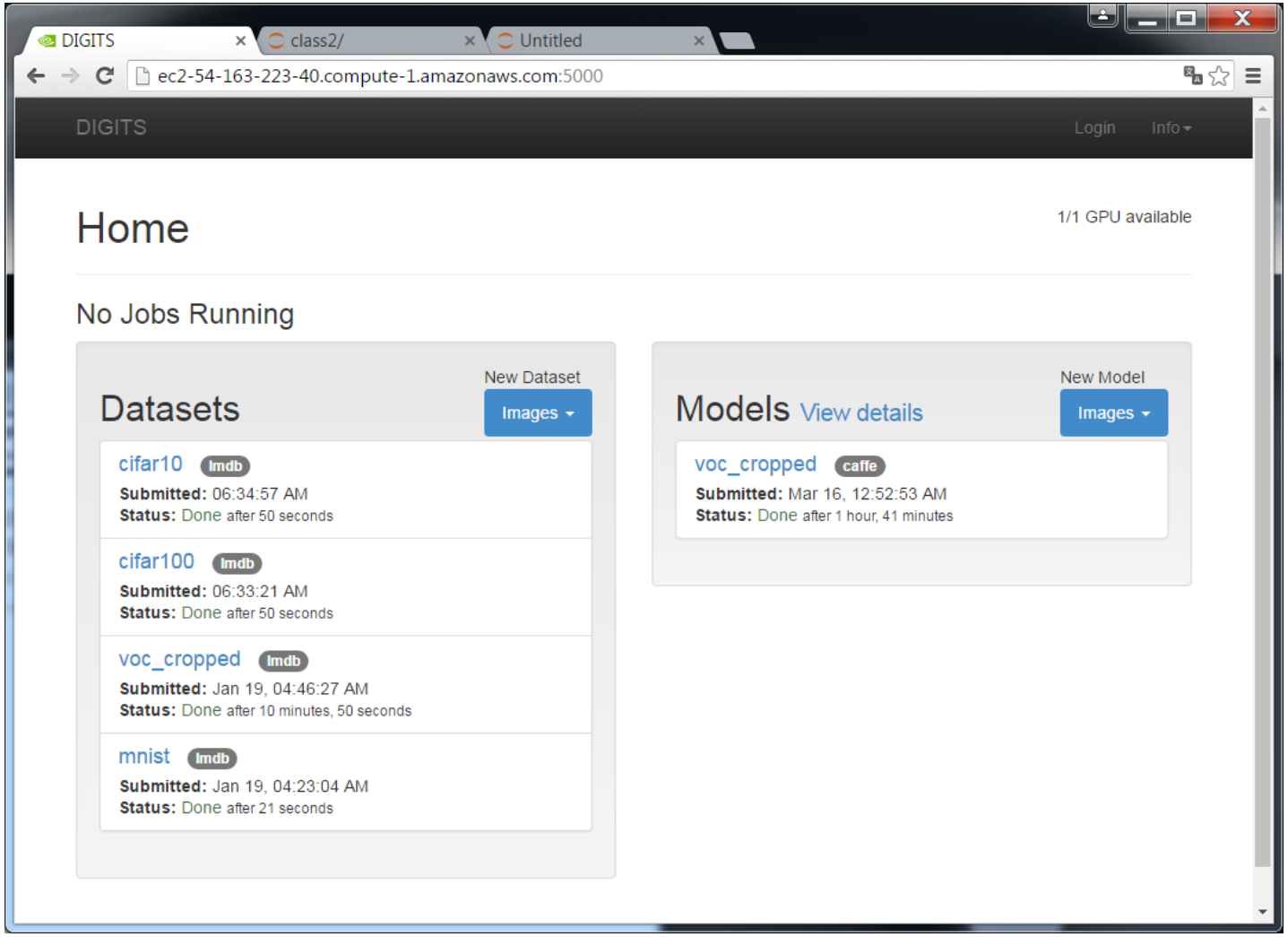
STEP3
DL training



STEP4
inference

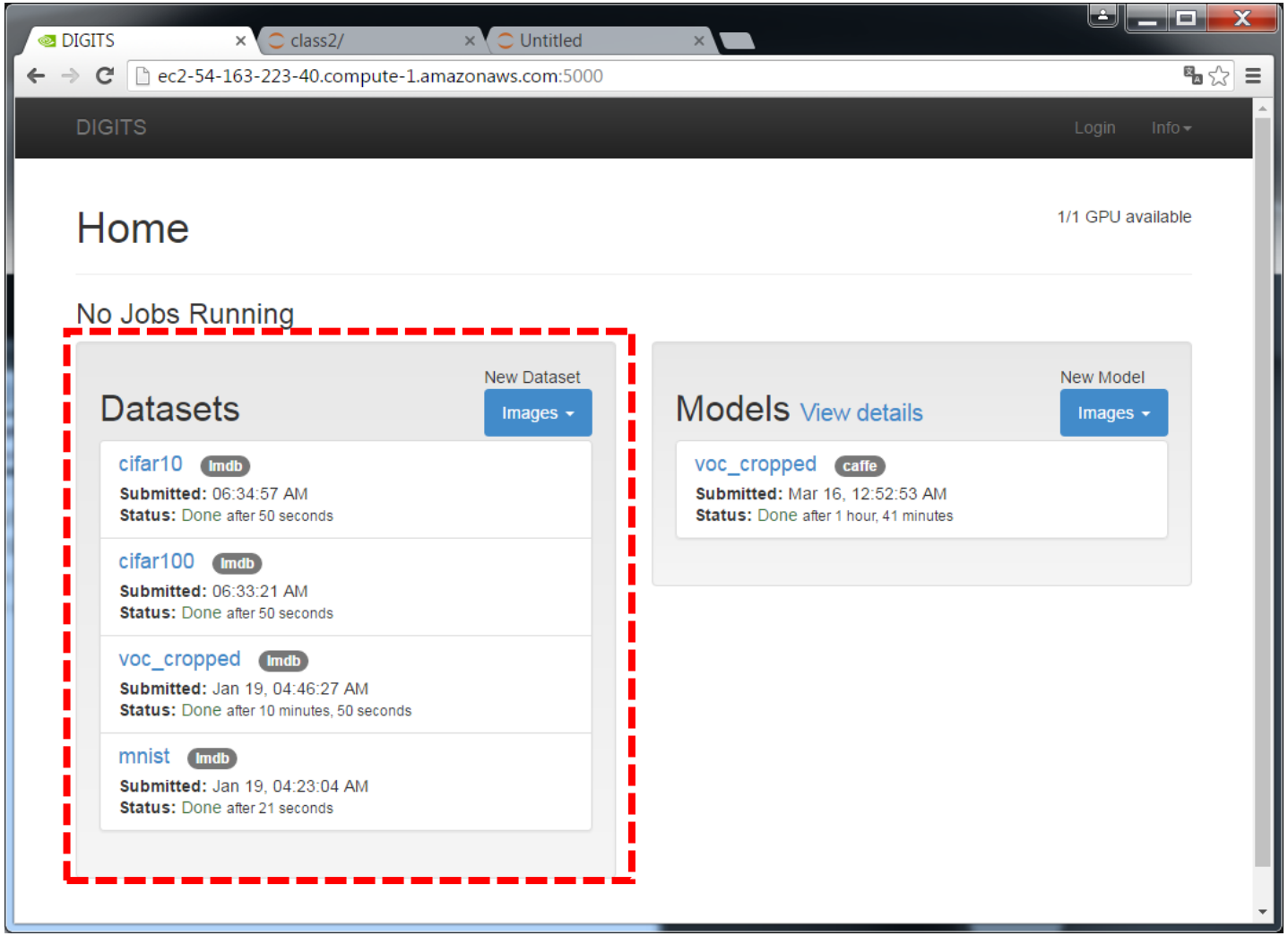


DIGITS UI (home)

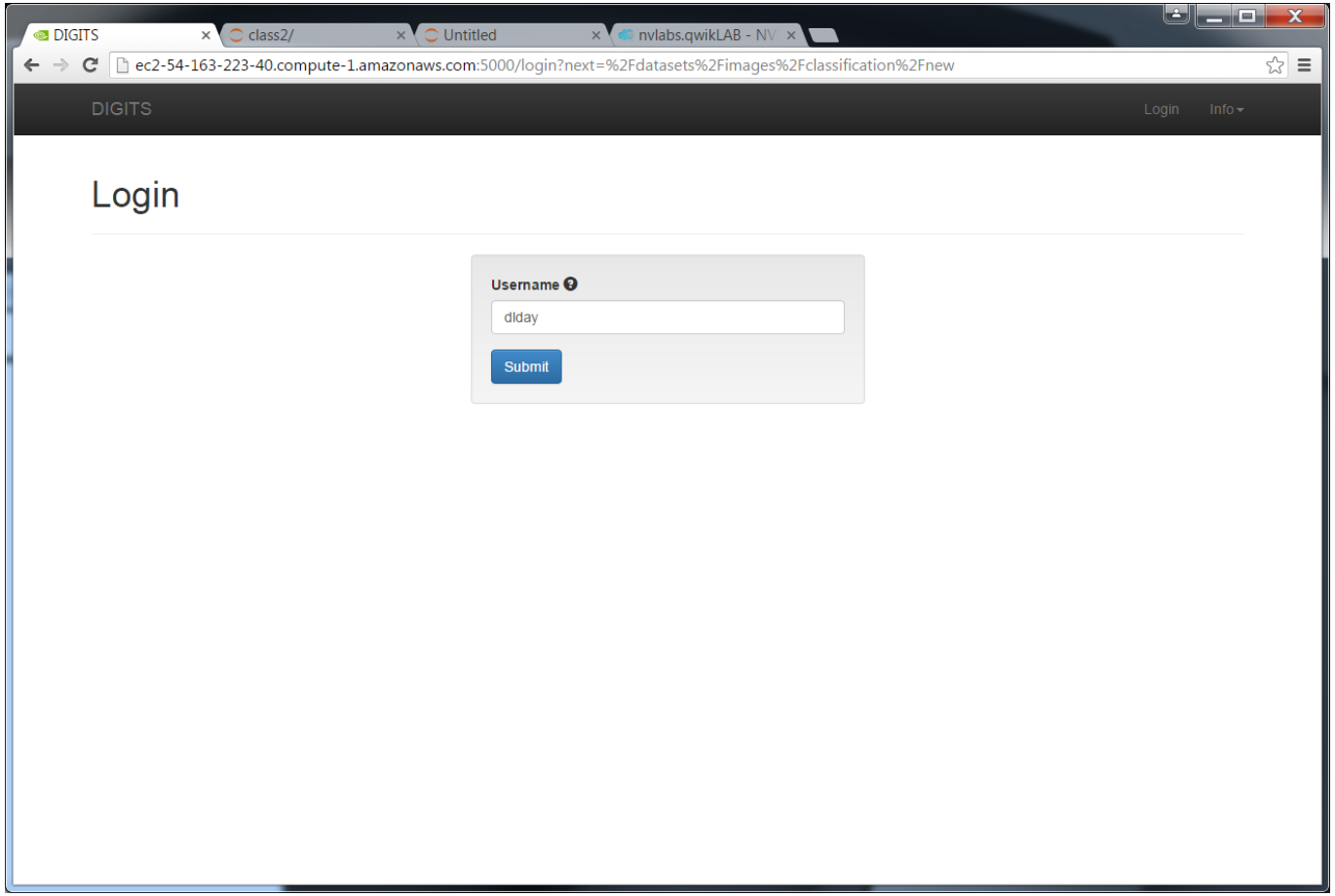


DIGITS UI (Datasets)

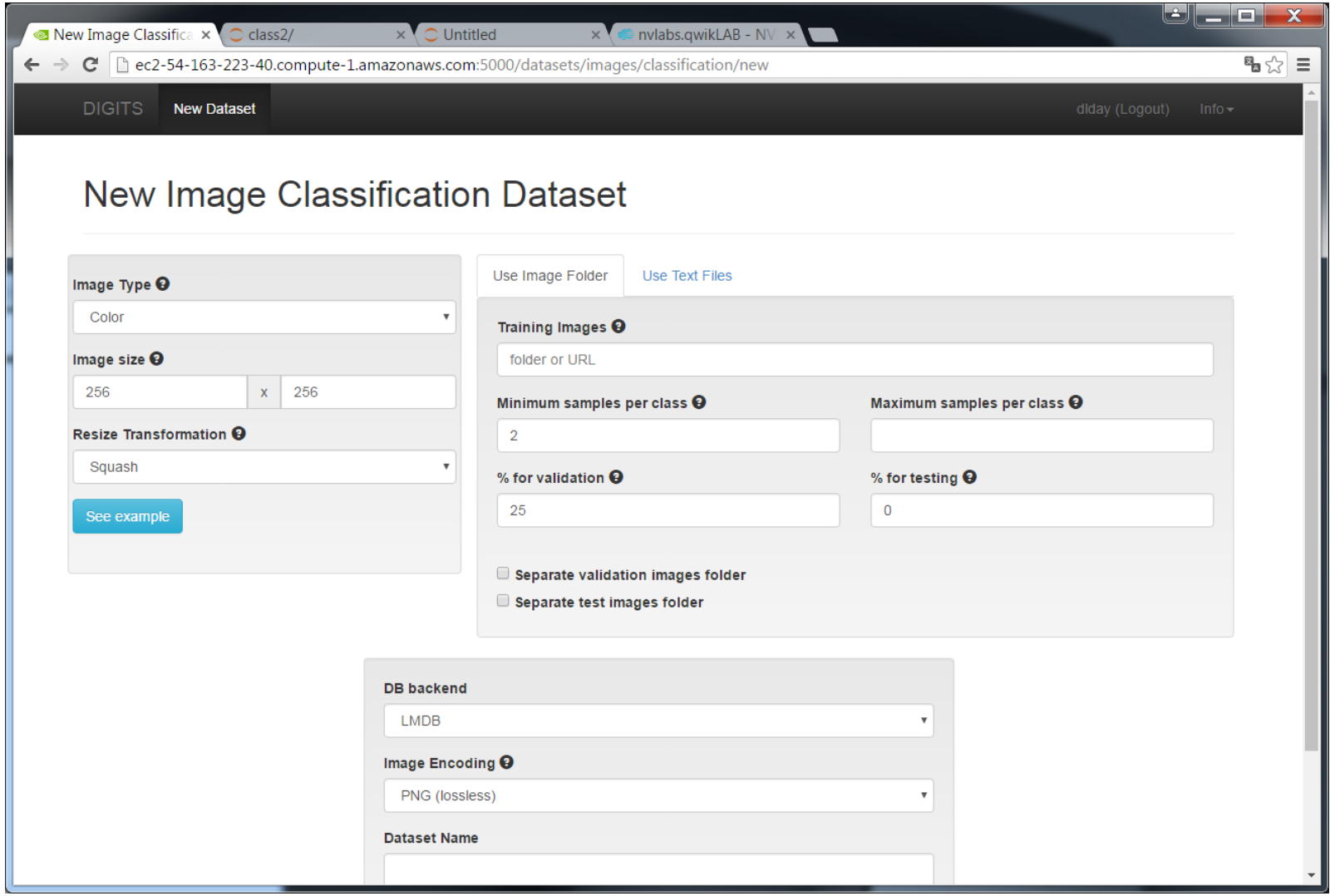
Prepare Data



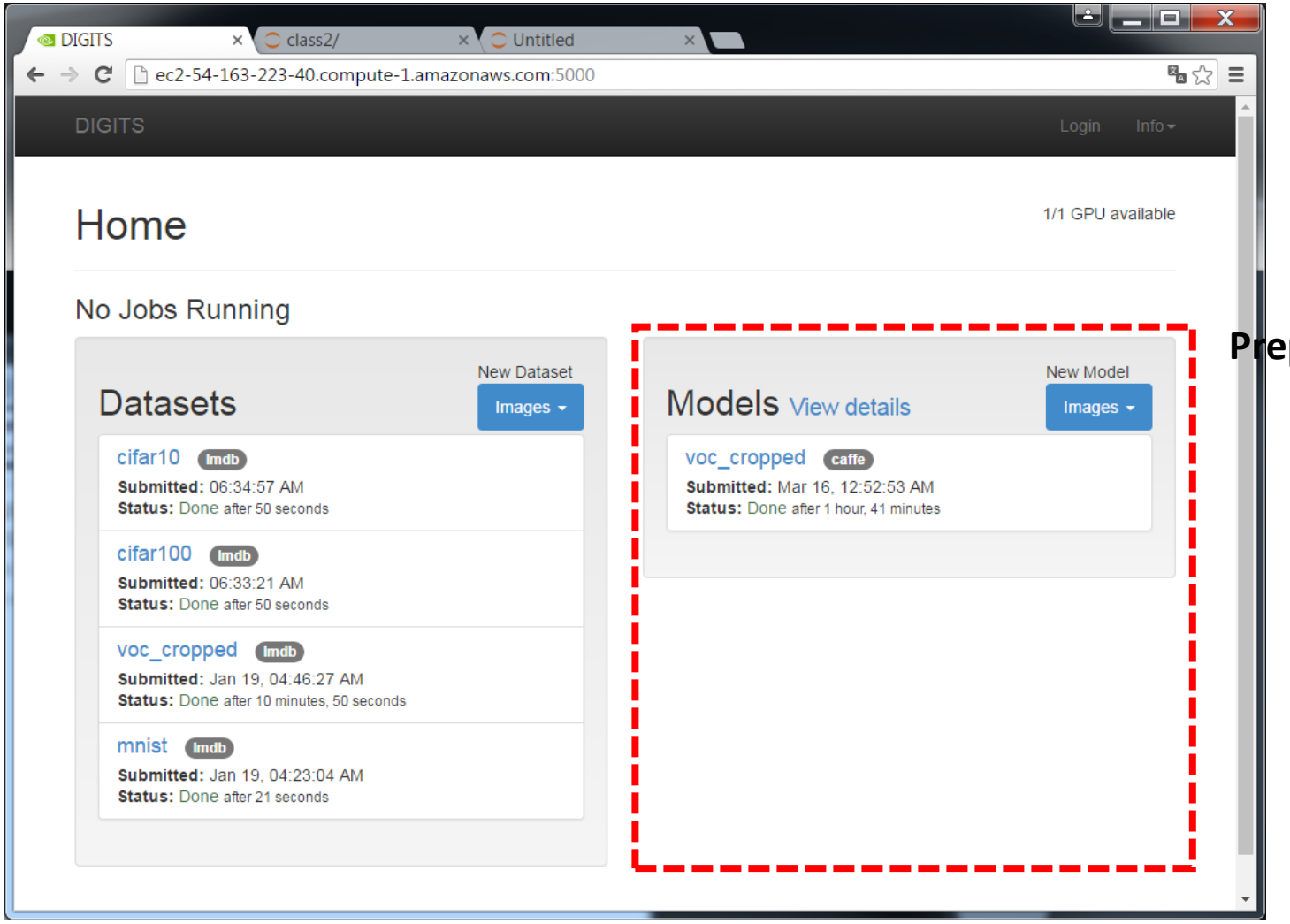
DIGITS UI (login)



DIGITS UI (Datasets)

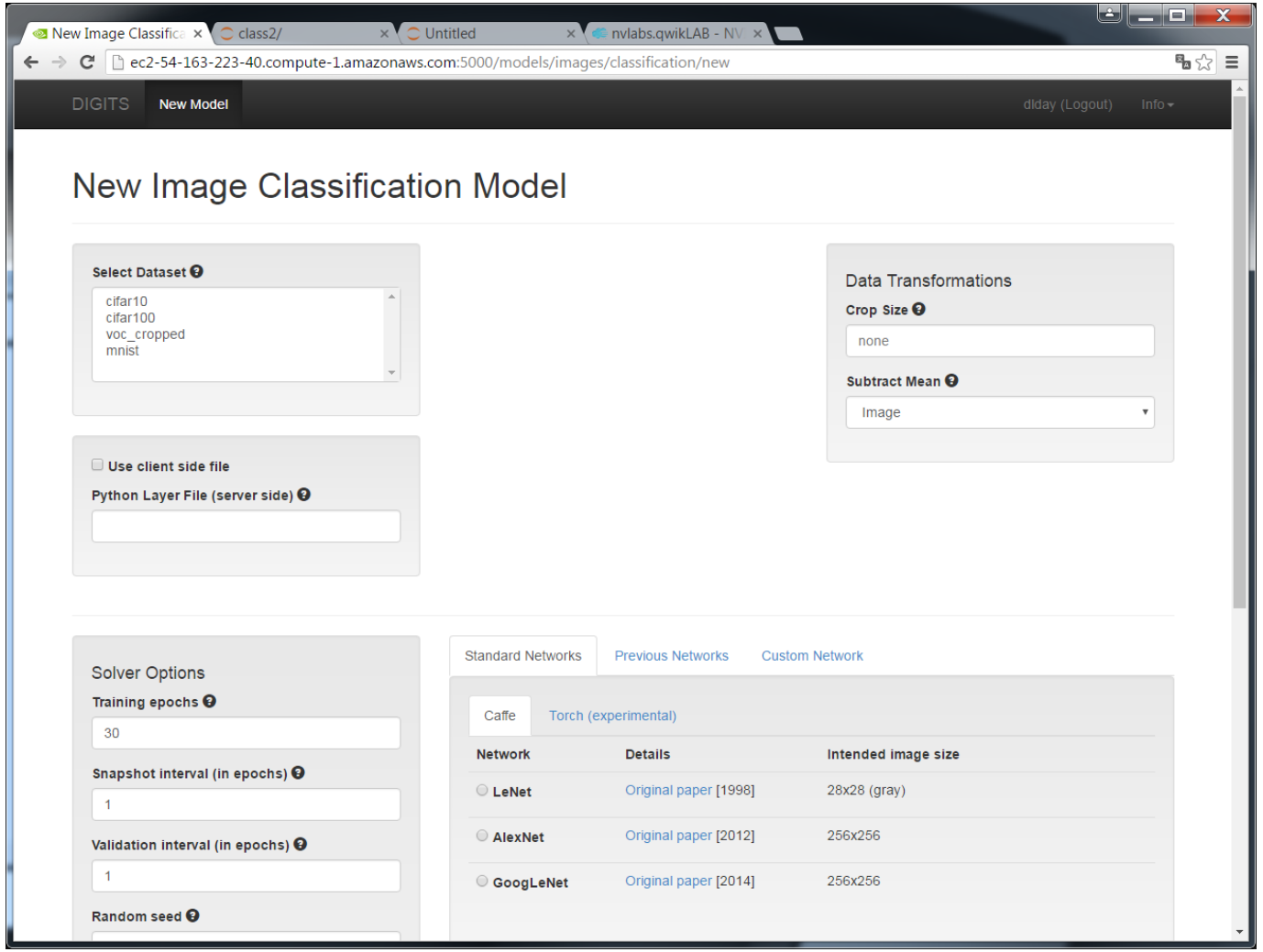


DIGITS UI (Models)

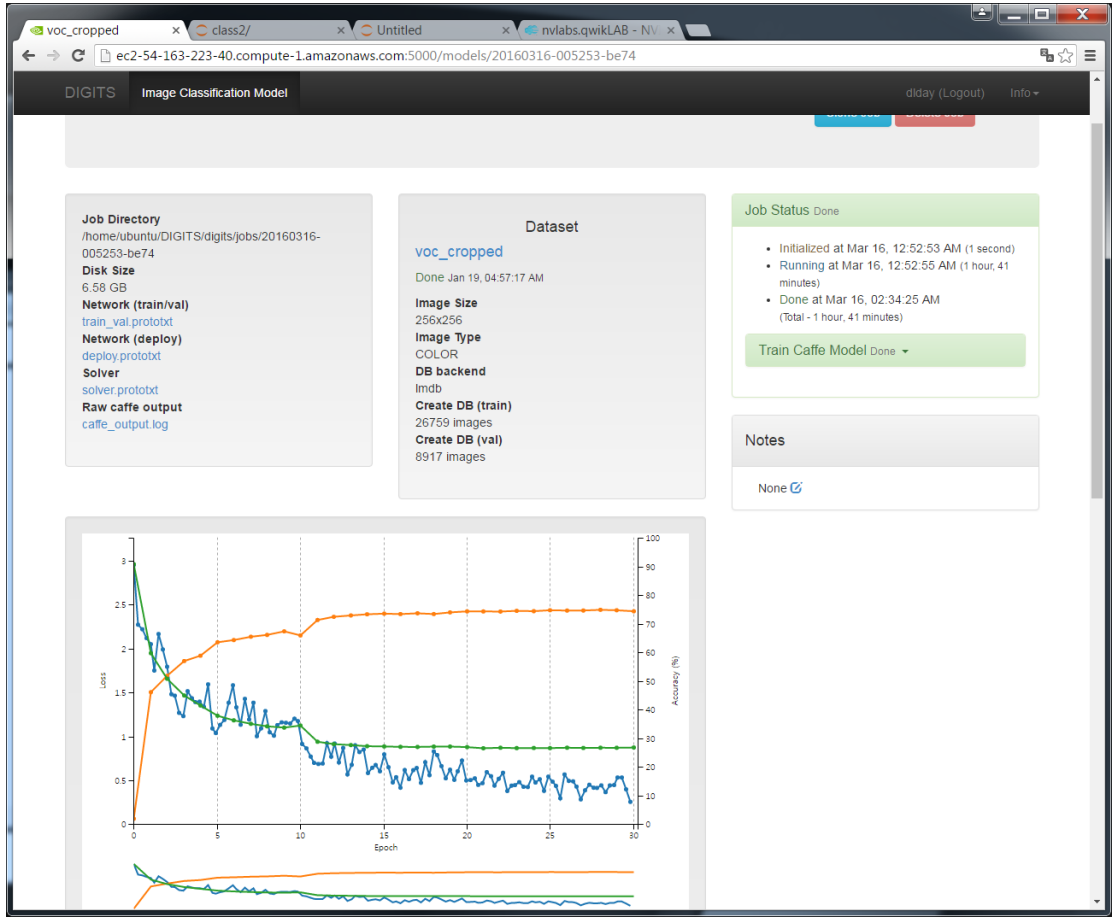


Prepare Model

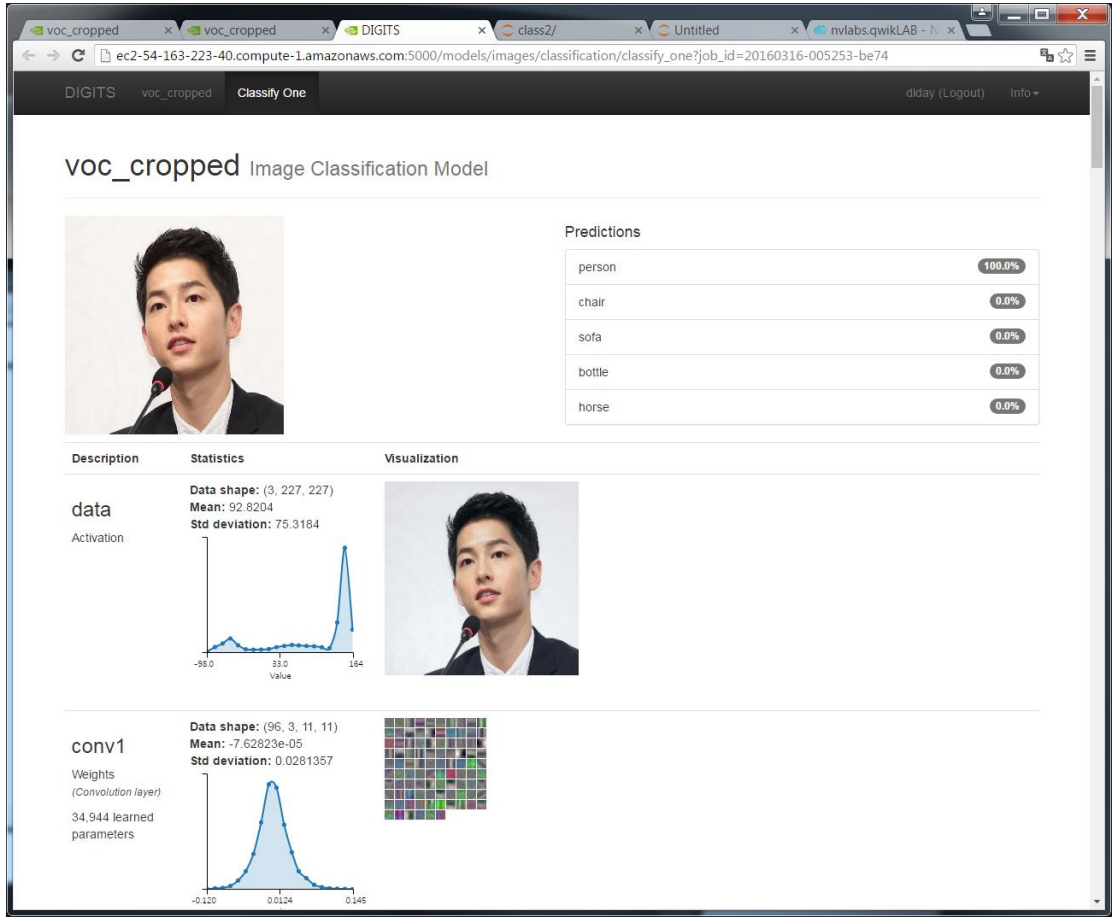
DIGITS UI (Models)



DIGITS UI (training)



DIGITS UI(inference)



실습 DIGITS Dataset

Dataset is in below directory

/home/ubuntu/data/

MNIST dataset

/home/ubuntu/data/mnist

Python Class2

PASCAL VOC dataset

/home/ubuntu/data/voc_cropped


horse


person


chair


person


person


motorbike


sheep


chair


person

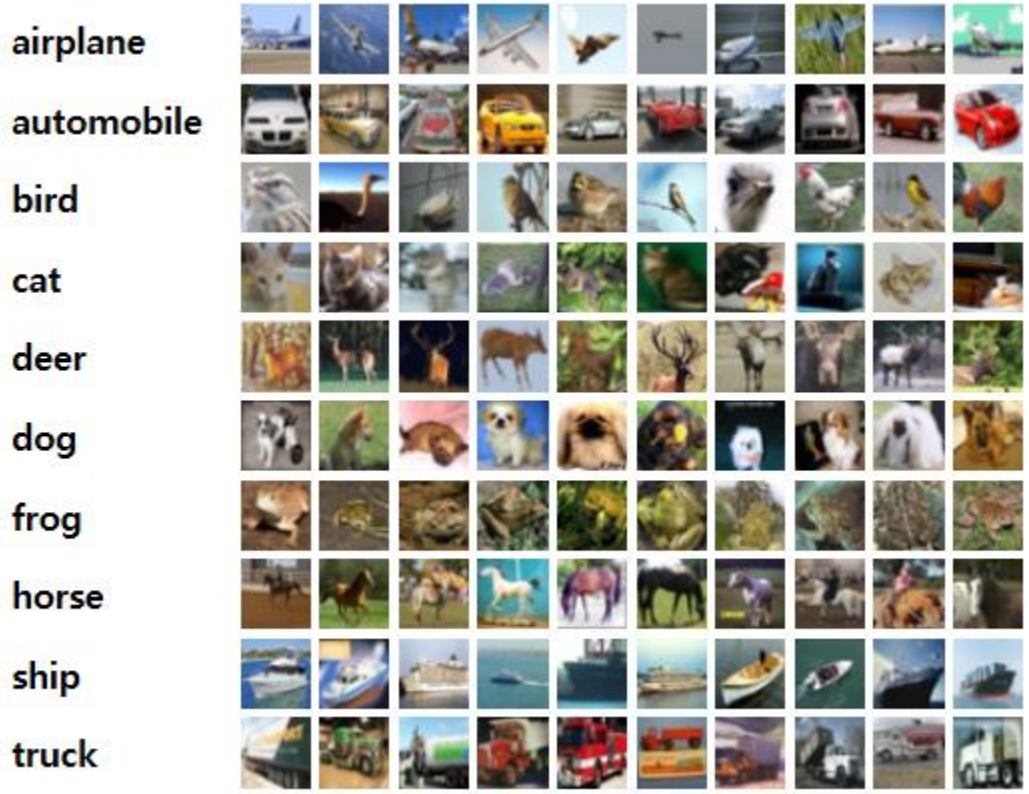

bicycle


person


cat

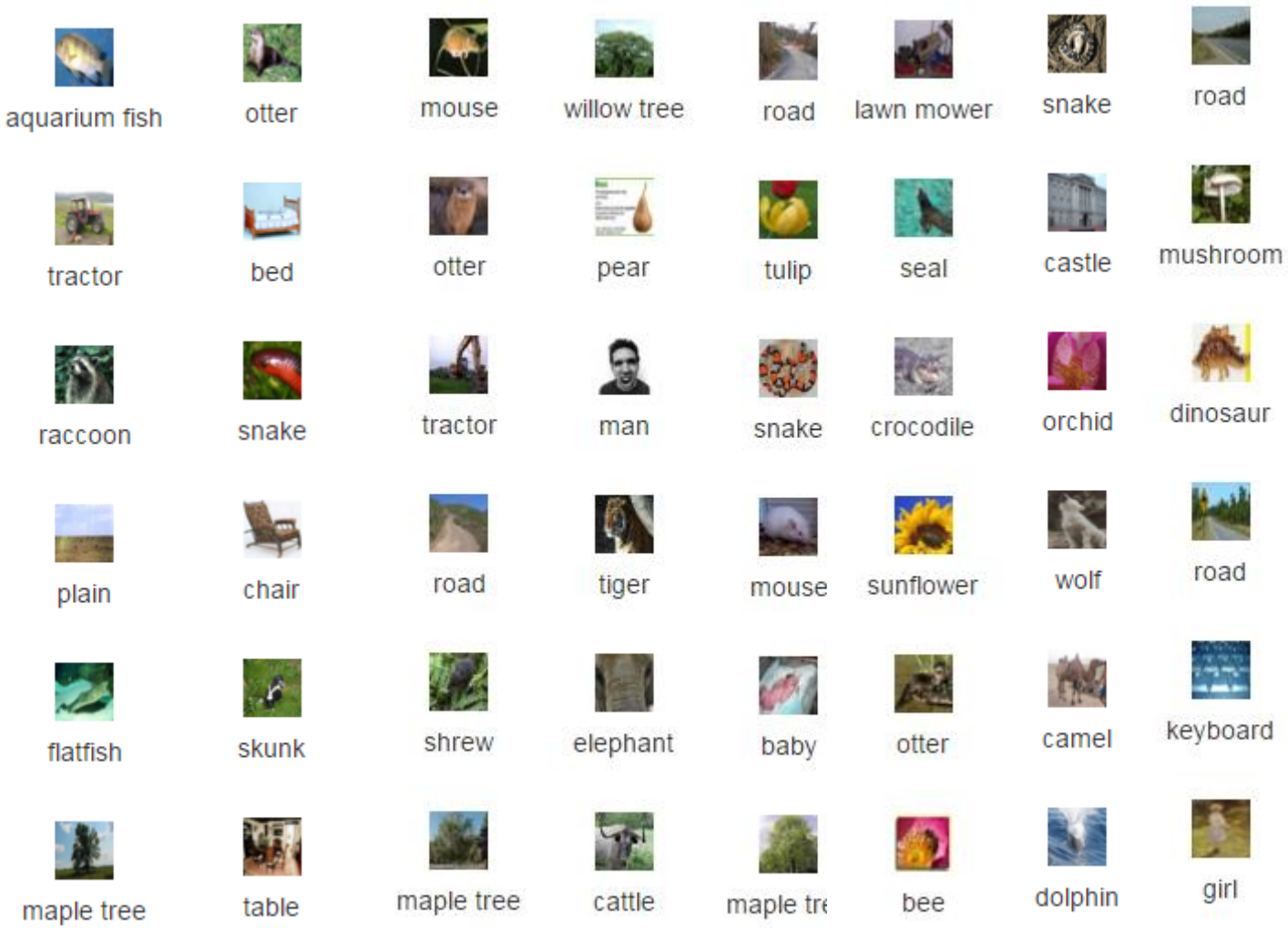
CIFAR-10

/home/ubuntu/data/cifar10



CIFAR-100

/home/ubuntu/data/cifar100/fine



실습 DIGITS
DL Model & train

https://github.com/yhgon/KRDLDAY2016

실습 python Class1
CIFAR-10/100

실습 Python Class2 whale Dataset

Subset (500 images)

North Atlantic right whale

Kaggle Right Whale Recognition

https://www.kaggle.com/c/noaa-right-whale-recognition

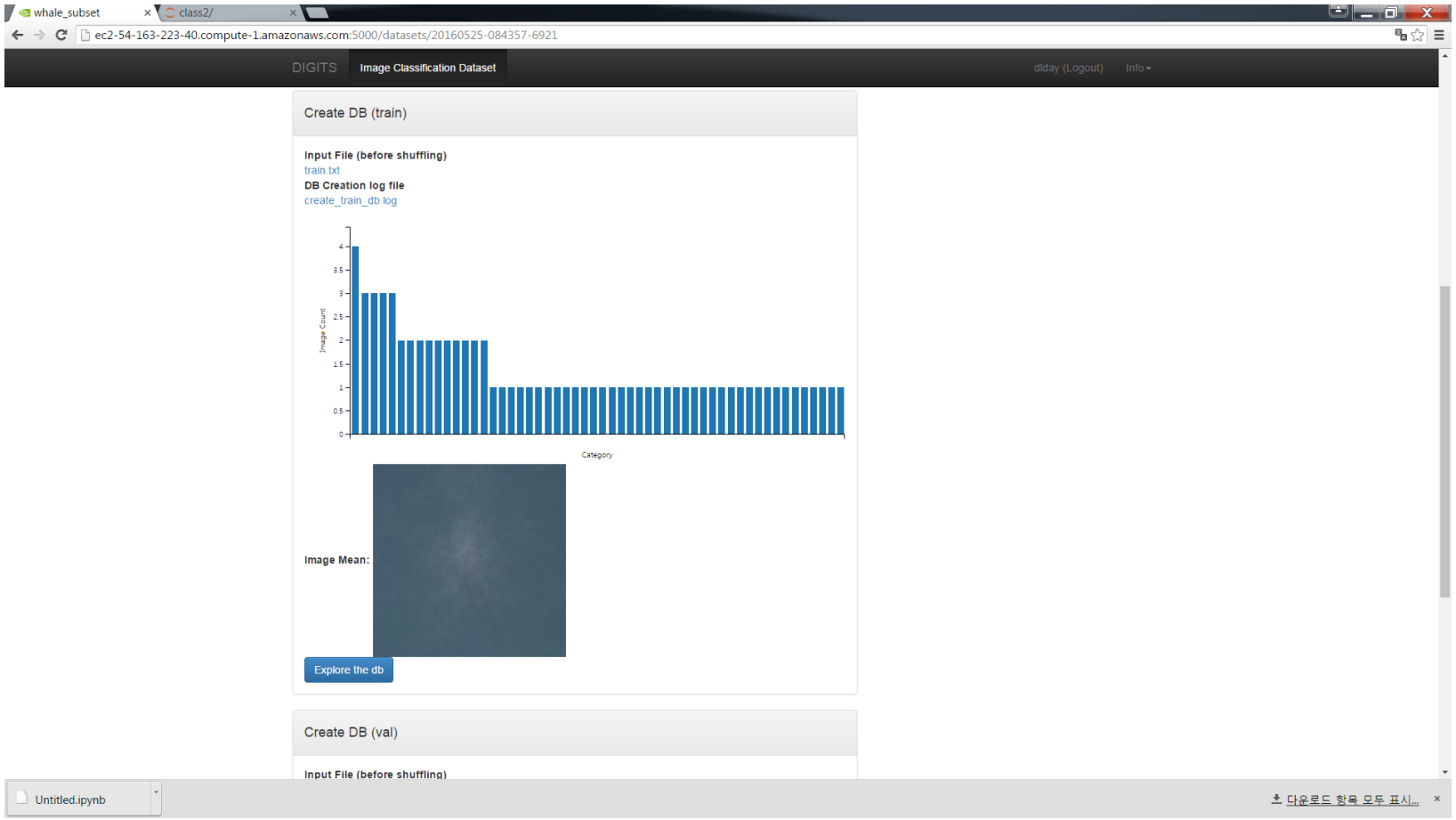
Identify endangered right whales in aerial photographs

With fewer than **500** North Atlantic right whales left in the world's oceans, knowing the health and status of each whale is integral to the efforts of researchers working to protect the species from extinction. Currently, only a handful of very experienced researchers can identify individual whales on sight while out on the water. For the majority of researchers, identifying individual whales takes time, making it difficult to effectively target whales for biological samples, acoustic recordings, and necessary health assessments. To track and monitor the population, right whales are photographed during aerial surveys and then manually matched to an online photo-identification catalog.

DIGITS Data

- files on subfolders
- files with train/validate/test list & label info
- lmdb files with generated train/validate/test list & label info

Whale subset DB

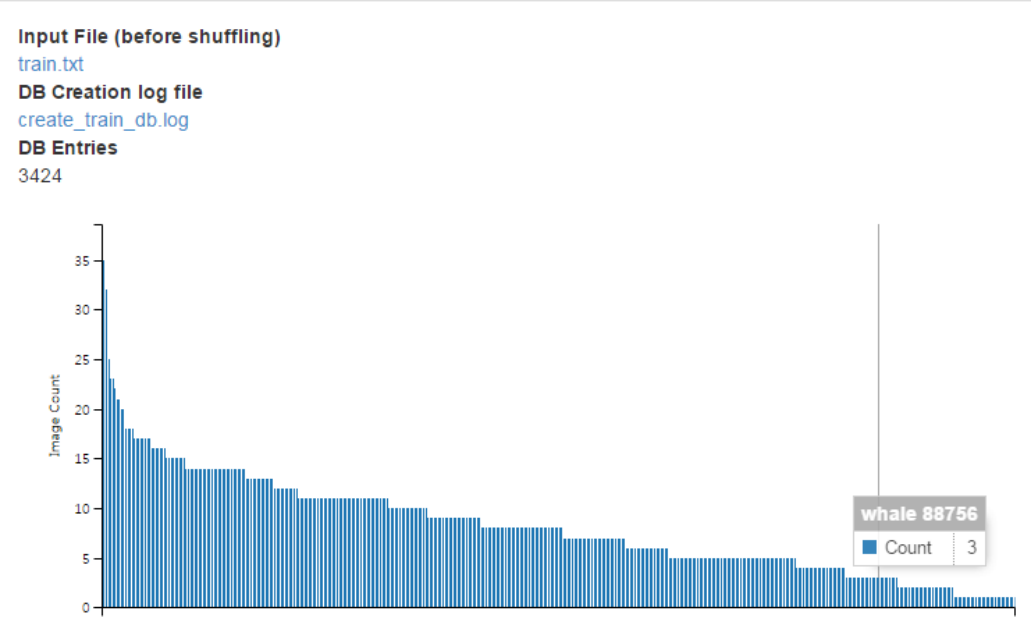


실습 Python Class3
Whale Dataset (7GB)

Problem : Accurate for Whale Dataset

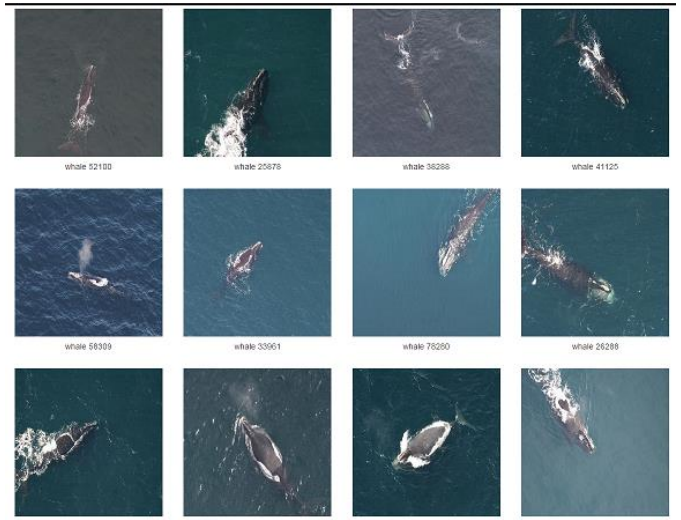
Main Problems

Histogram



few images per whales

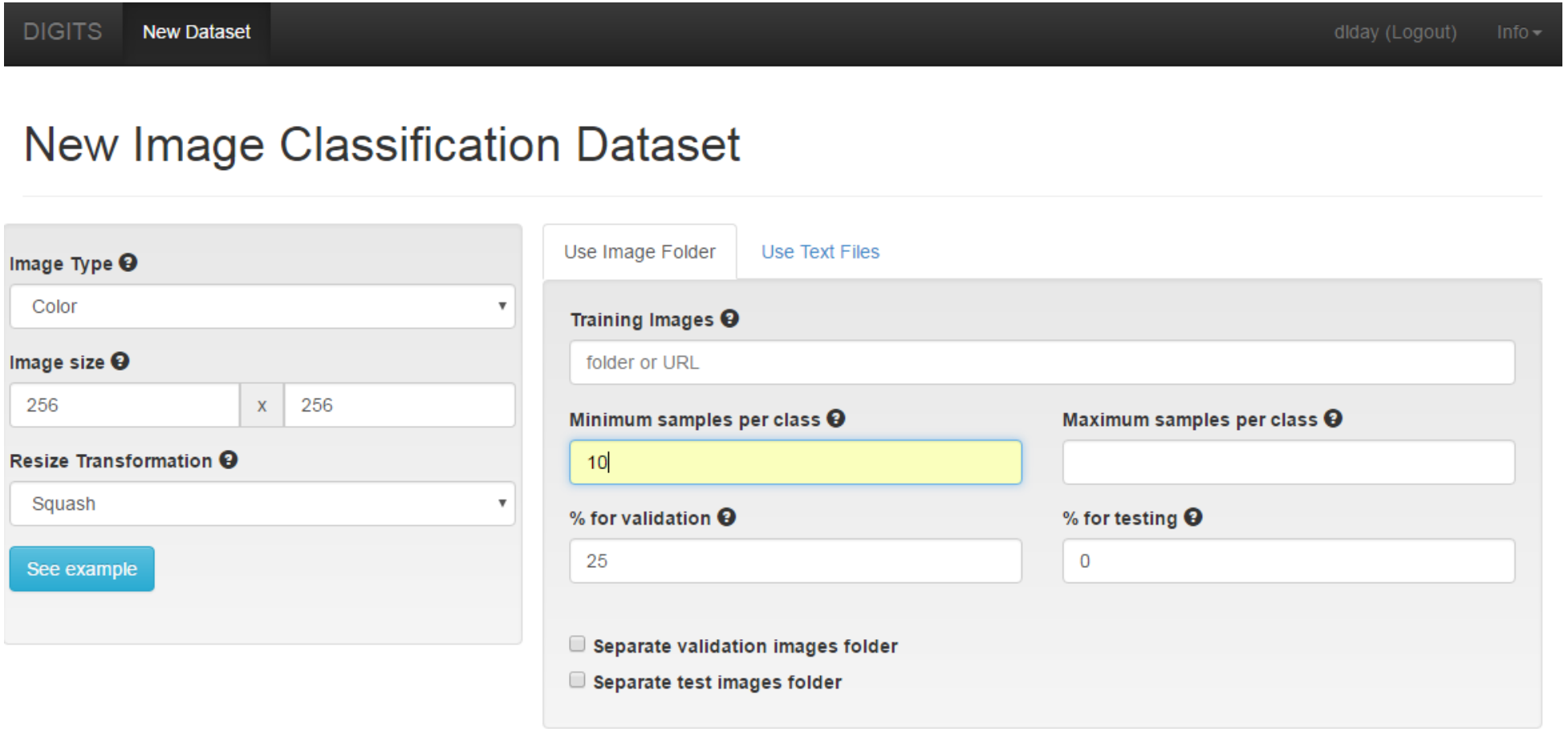
Feature for Images



Location of whale
Direction of whale
spray of sea water
Shap of body

Meaningless metadata

truncate


DIGITS
New Dataset
dlday (Logout)
Info
New Image Classification Dataset
Image Type
Color
Image size
256
x
256
Resize Transformation
Squash
See example
Use Image Folder
Use Text Files
Training Images
folder or URL
Minimum samples per class
10
Maximum samples per class
% for validation
25
% for testing
0
Separate validation images folder
Separate test images folder

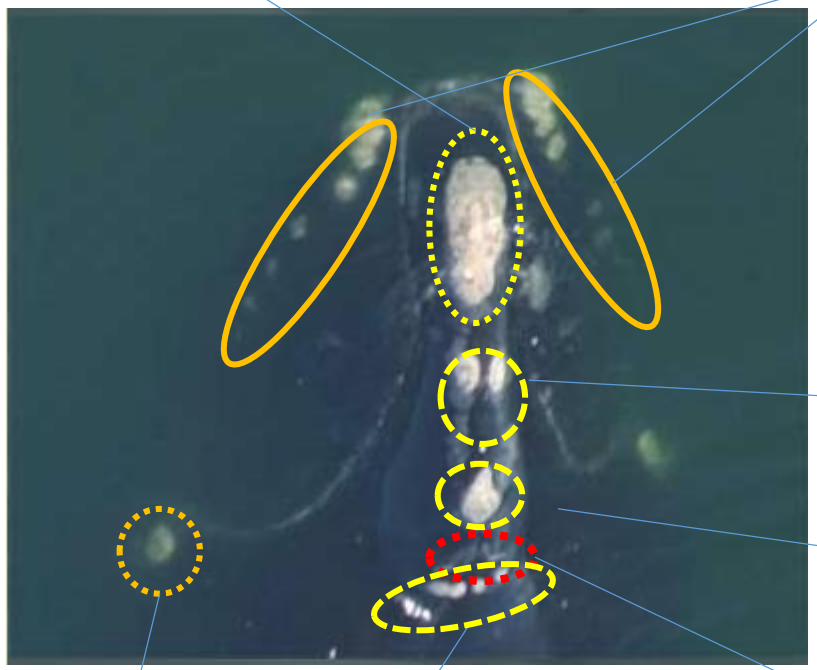
Object Classifier vs recognition

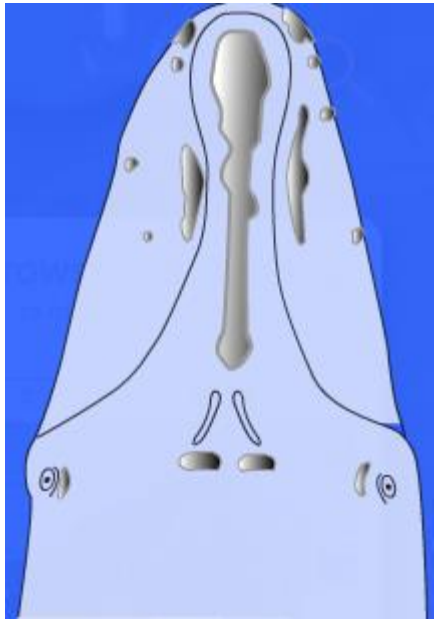
vs

vs

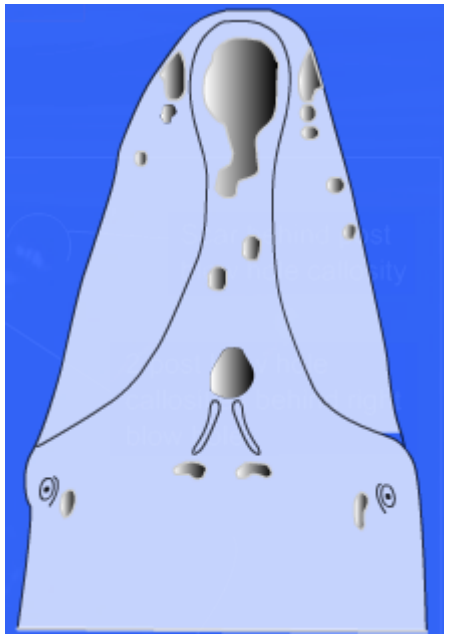
Whale Face recognition

Chracteristic of Right Whale





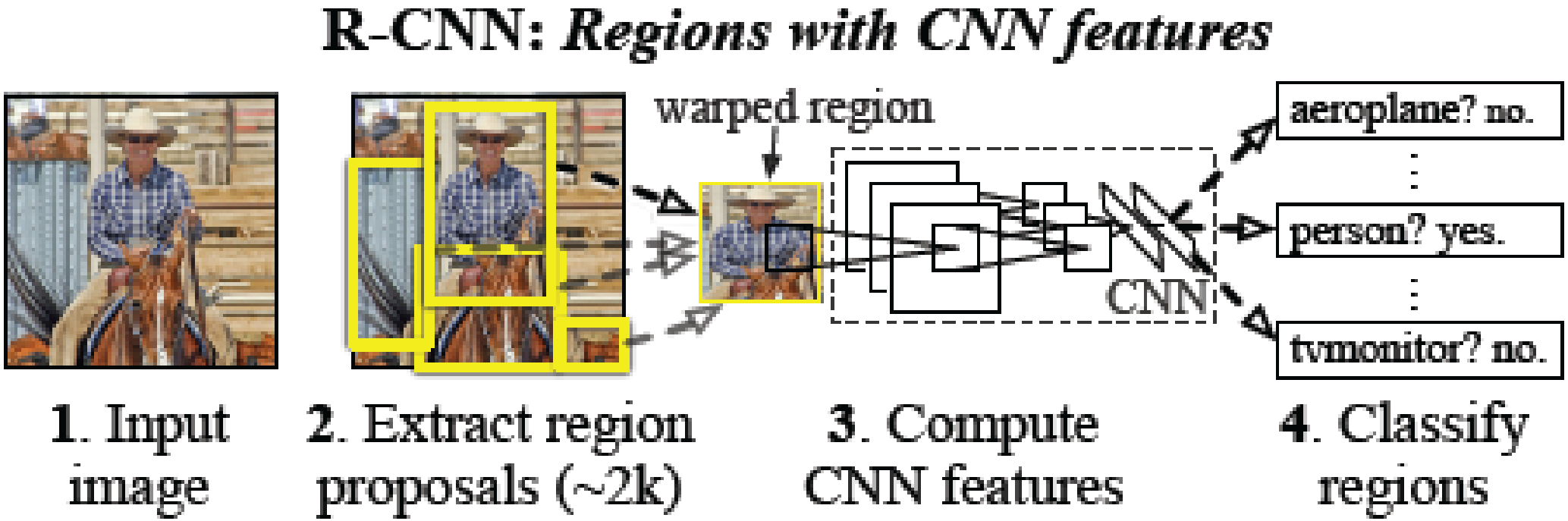
Continuous Callosity with one Peninsula



Broken Bonnet with one Island

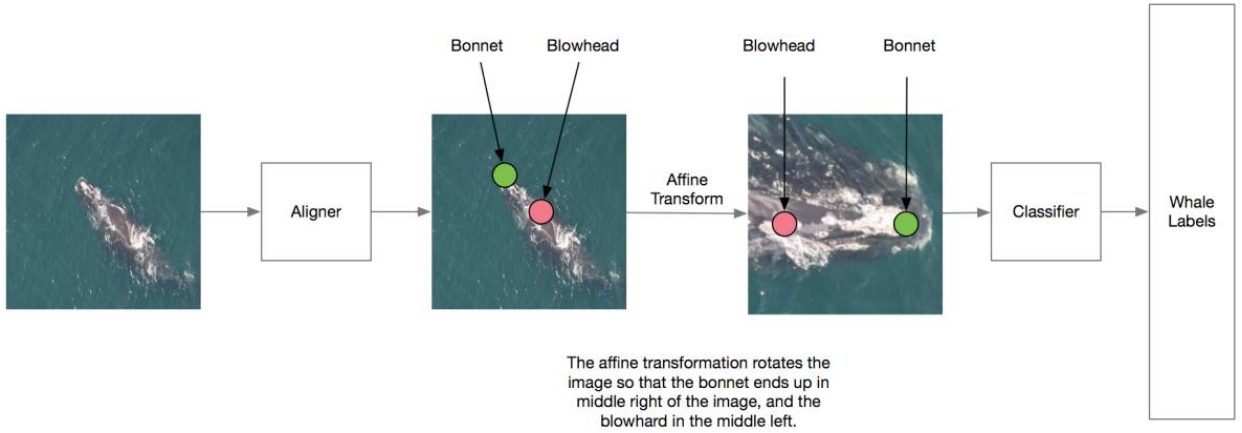
실습 Python Class4
object detection & crop

R-CNN (localization)

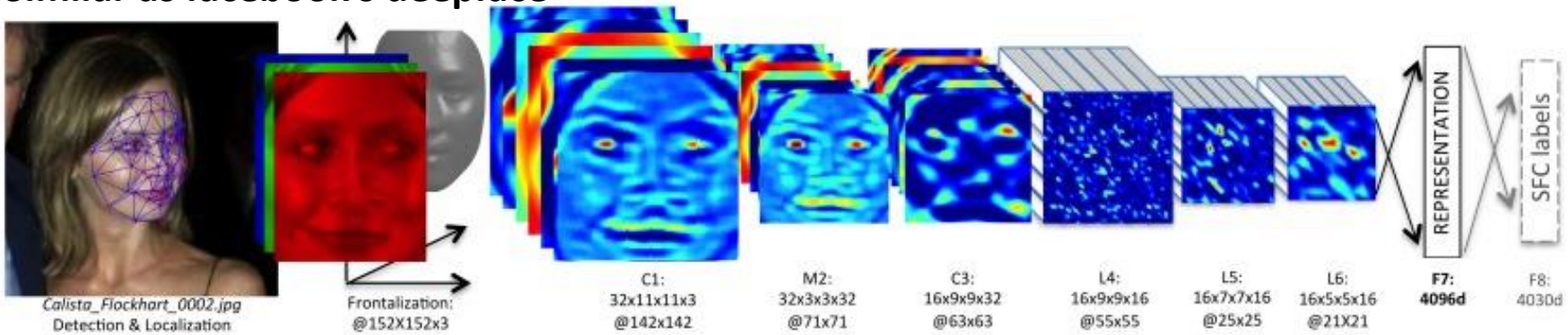


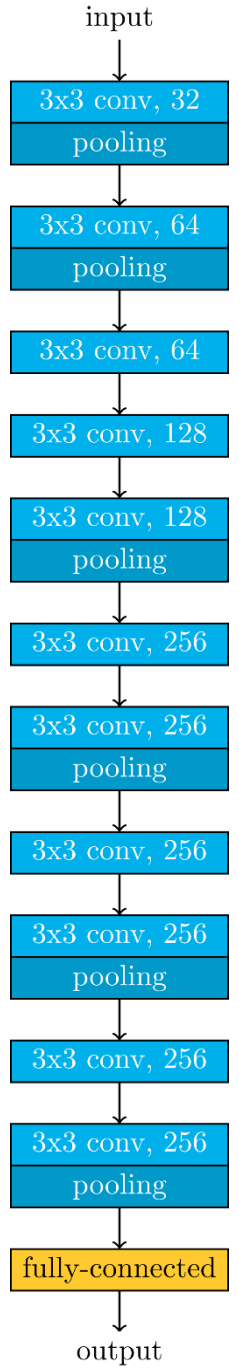
deepsense.io : Kaggle Winner

http://blog.kaggle.com/2016/01/29/noaa-right-whale-recognition-winners-interview-1st-place-deepsense-io/



Similar as facebook's deepface



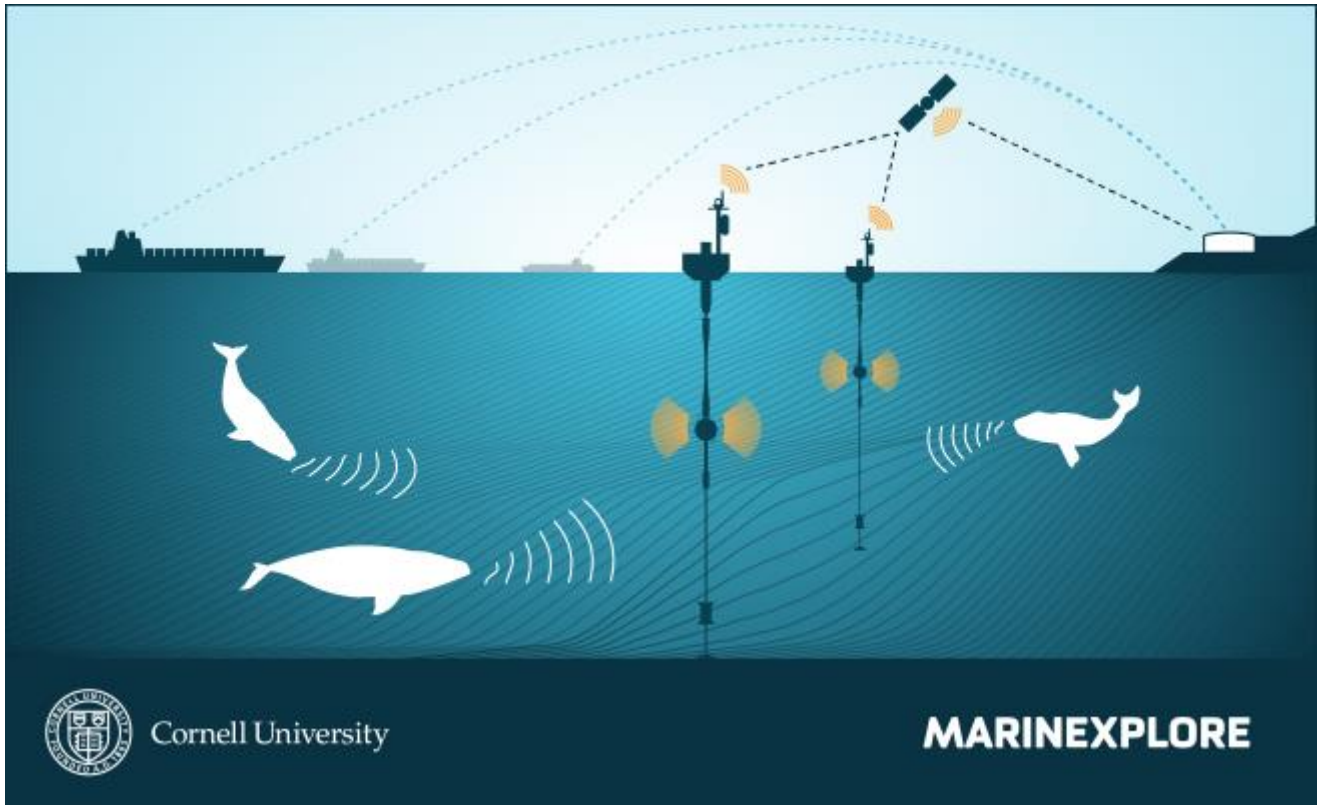


실습 DIGITS
custom python layer

실습

Audio(FFT) → Image(spectrogram)

Whale Sound or not



Thanks