29-12-2024

Image classification ⟶

Dog, cat, car, Bike

Dataset
- Dog — Dog1.jpg
  - Dog2.jpg
- cat
- car
- Bike — Bike1.jpg
  - Bike2.jpg

python ⟶ train, val, test

→ Dataset

→ Dog → no of image → 0.7, 0.2, 0.1 — train val test split

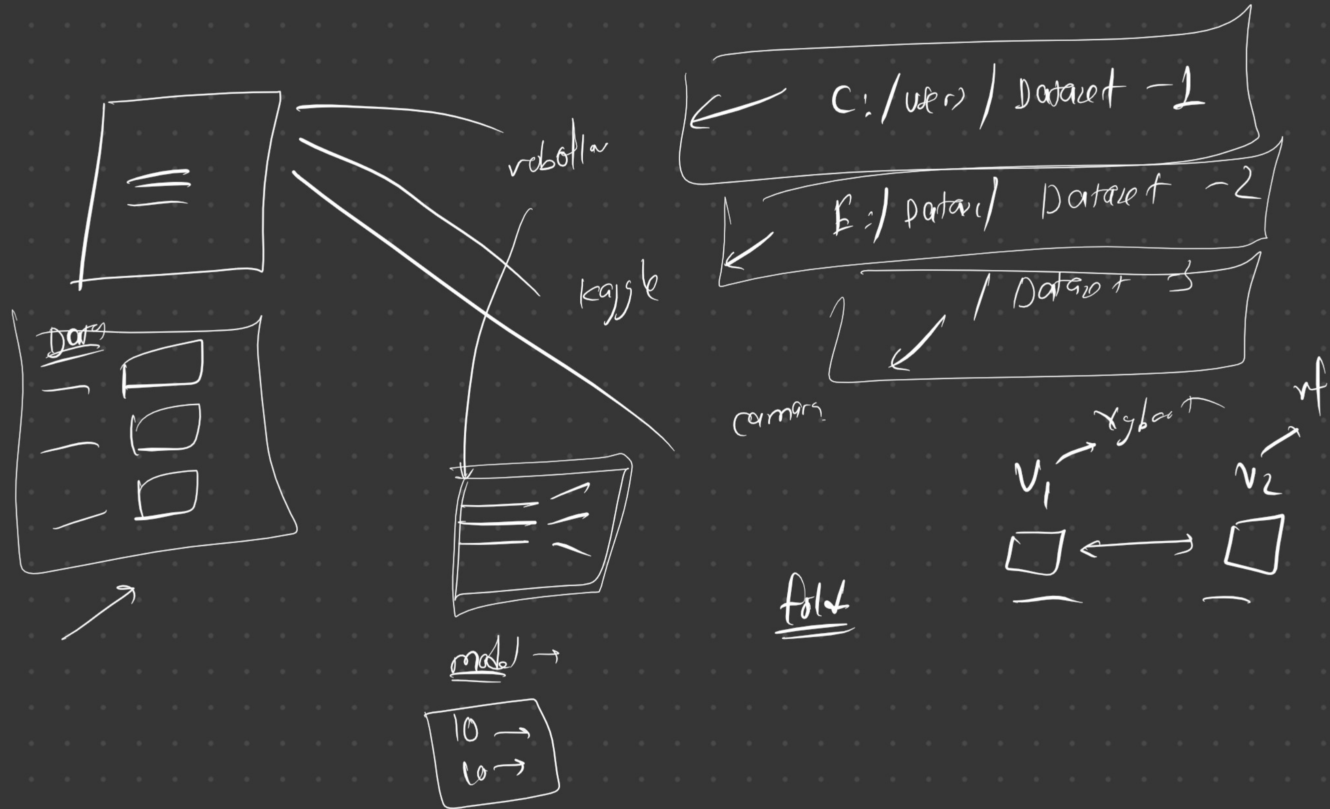
Train
- Dog → 0
- cat → 1
- car → 2
- Bike → 3

val
- Dog
- cat
- car
- Bike

Test
- Dog
- cat
- car
- Bike

64

10



os.listdir("main)

— Dog → full path

— cat

— Bike

os.getcwd()

o/p

c:/user/main/Dog ← os.path.join(main path, Dog)

local path

→ [dog1.jpg, cat2.jpg, dog1.jpg]

→ [0, 1, 0]

image_path = [a.jpg , cat.jpg , b.jpg]

image_class = [1 , 2 , 3]

csv   folder

, csv , json , pkl

[c://user/Train/Dog/Dog1.jpg]   [0]

[c://user/Train/cat/cat4.jpg]   [1]

processing

label

c://user/Train/Dog/axbxcddel.jpg

Dog —
cat —

Dog , cat

c://user/Train/Dog1.jpg ,
/ cat1.jpg

mix

cat , Dog

Data preparation

128, 128

copy → Dog → cv.resize(128, 128)
C → write()

256 x 256

→ transform.compose([
resize()
ToTensor()
])

Dataset →

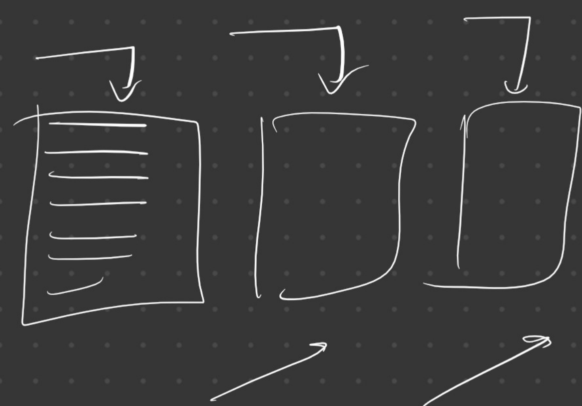


Image net

ocean

len [0 , 0 , 5 , 1]

[1, 128, 128]

→ 2

→ len(3) [ ]

0.78
0.80

[0.3, 0.67, 0.21] → 64

640 — Train , batch = 64

epoch 1 → for i in range(Total / batch)

→ for img , label in dataloader →

loss → 1 → 1.3

2 → 0.6

⋮

10 → 0.7

$\frac{\text{sum}}{10} = \text{avg}$

→ distribution → Train →

100

→ Test

↓

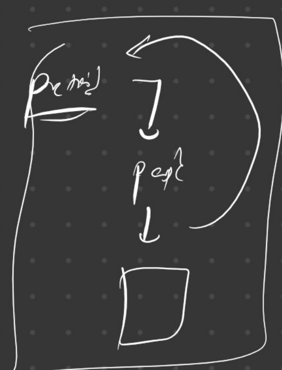
Pitbull

30%

CNN

→ ear

number plate → roboflow — kaggle — US CN E →



train →

collect

C → Conv

S → Subsampling → average pooling

Lenet :-

32x32 → 6 filter 5x5 C1 → 28 x 28 x 6 → 2x2 average pooling S2 (stride 2) → 14x14x6 → 16, 5x5 C3 → 16x10x10 → 2x2, 2 S4 → 5x5x16 → 120 → 84 → 10

0
1
2
3
4
5
6
7
8
9

→ Convulation layer → 1

→ pooling → Avarag pooling → 2

→ Local receptive fied → 5x5 → edges, lines, pattern

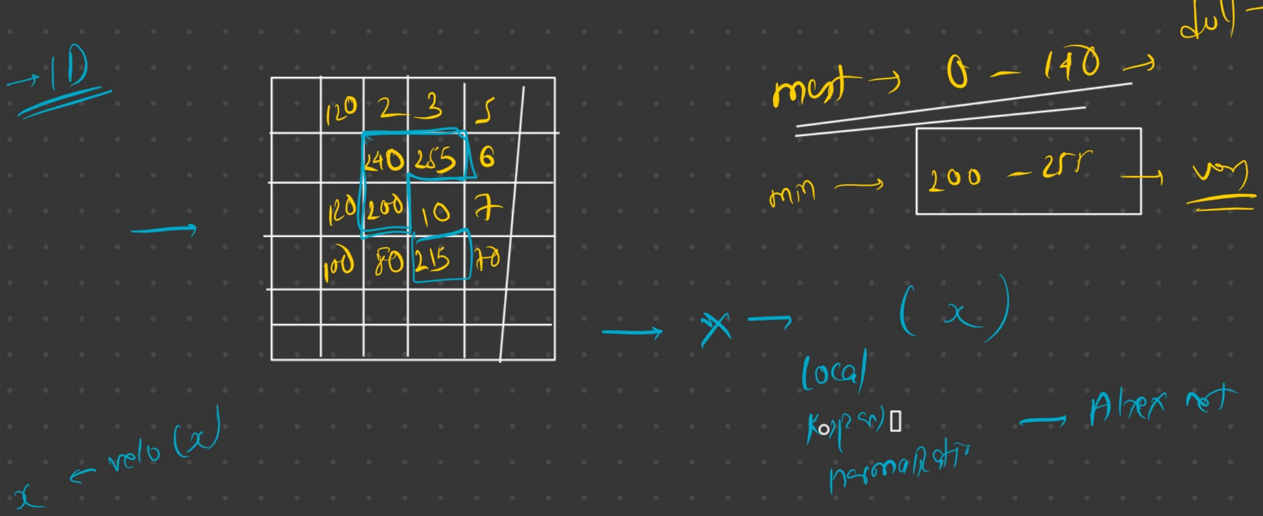
→ 3

Alex

224x224x3 → Conv1 C 11x11 s-4 f-96 → MP1 3x3 s-2 → conv 2 5x5 f-256 → MP2 3x3 s-2 → Conv3 3x3 f-384 → conv 4 3x3 f=384 → conv5 3x3 f=256 → mp3 3x3 s→2 → FC1 4096 → FC2 4096 → output layer 1000

→ ReLU activation → GPU acceleration
→ Data Augmentation → Local response normalization (LRN)
→ Dropout → K, α, β

→ Local Response normalization



→ LRN

— enhance response of a neuron when it is surrounded by similar neurons but it suppress the response of neuron with large activation.