WEEK 6
COUNTING IN DENSE CROWDS USING DEEP LEARNING

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LAST WEEK

- Shifted to a 5-Fold Validation Setting
- Obtained Large Mean Square Errors
- Generated Homogenous Kernels
- Analyzing Code & Finding Errors

CURRENT PROGRESS

DIFFERENT METHODS

- Pre-trained Networks:
  - Caffe-AlexNet
  - Caffe-Ref
  - ImageNet-VGG-VeryDeep-16
  - ImageNet-VGG-VeryDeep-19
- Layers of Network:
  - ReLu 6
  - ReLu 7
  - Layer 5

RESULTS FROM LAST WEEK

- Chi Square Kernel:

Mean squared error = 3.05719e+13 (regression)
Squared correlation coefficient = 0.00215527 (regression)

Absolute Difference (AD): 291192322.42
Normalized AD (NAD): 28080262.53

- Homogenous Kernel Map:

Fully Connected Layer 6 with L1 Normalization:
Absolute Difference (AD): 431.15, Normalized AD (NAD): 37.86

Fully Connected Layer 7 with L1 Normalization:
Absolute Difference (AD): 454.23, Normalized AD (NAD): 39.42

IMPROVEMENT IN RESULTS

- Chi Square Kernel in AlexNet:

Relu6 with L1 Normalization:
Absolute Difference (AD): 447.06, Normalized AD (NAD): 38.94

Relu7 with L1 Normalization:
Absolute Difference (AD): 463.07, Normalized AD (NAD): 37.35

- Original Results:

Absolute Difference (AD): 324.42, Normalized AD (NAD): 30.91

ANOTHER APPROACH

- Fusion of SIFT Features with CNN Features from AlexNet:

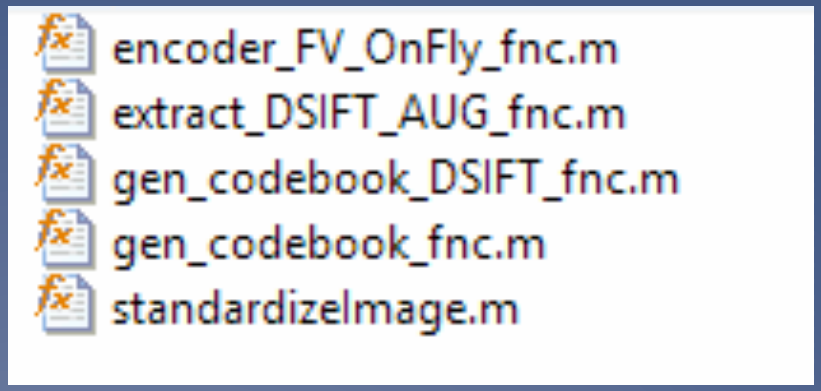
Relu6 + SIFT with L1 Normalization:
Absolute Difference (AD): 297.55, Normalized AD (NAD): 27.53

Relu7 + SIFT with L1 Normalization:
Absolute Difference (AD): 294.45, Normalized AD (NAD): 29.31

Relu6 + SIFT with L2 Normalization:
Absolute Difference (AD): 305.08, Normalized AD (NAD): 37.21

FISHER VECTORS

- Obtained code for generating fisher vectors
- Working on generating the codebooks with Dense SIFT



NEXT STEPS

- Continue Training & Testing for Better Results
- Generate & Encode Fisher Vectors
- Apply Work to Videos