Algorithms for Image Processing

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Problem Sheet 4

Problem 1 (First week)
Two-layer fully connected network.

a) Implement a two-layer fully-connected net. For training, use backpropagation and batch gradient descent with a decreasing learning rate.

b) Use pixels as features. Train the model on the CIFAR 10 data set. (Don't forget to preprocess your data.) Run your model on the test part of the CIFAR 10 dataset and report the accuracy.

c) Use the HOG and color histogram as features and repeat part b).

Problem 2
Own small convolutional network in Pytorch.
Use Pytorch to train your own small convolutional network for the CIFAR-10 dataset.

Problem 3
Transfer learning on the CIFAR-10 dataset.
We suggest to use Pytorch and employ Alexnet pretrained on image net. (If you prefer other options, you are welcome to try them out.) Use transfer learning for the CIFAR 10 data set and try to reach an accuracy as high as possible.