Tutorial recap

Week 3:

• Difference between cross-correlation and convolution in spatial filtering?

• What aspect is included by the magnitude and phase of a Fourier transform?

• Give an example of a gaussian blur filter?

• Using the Fourier transform how do you apply a high bandpass filter?

Week 4:

• RGB vs XYZ – what’s a key difference?

• In Lab what does Lab stand for?

• Canny edge detection 5 steps:

• Effect of flipping sign in Sobel edge detector on output edge map?

Week 5:

• Why normalise data points?

• Why apply softmax to output of MLP?

• What is one way to determine if a model is starting to overfit in training?

• Parameter count MLP/CNN – my blogpost?

• Why do max-pooling?

Week 6:

• Why do batch normalisation?

• What is the purpose of residual layers?

• CAM vs Grad-CAM give 3 points of difference?

• List three methods for visualising neural networks?

• Considering within category variations (lighting, position, scale, rotation). T/F CNN’s invariant to scale and rotation?

Week 7:

• What is the purpose of the Hough transform?

• What’s the effect of changing the threshold parameter in Hough transform?

• Why use corners in an image as a feature?

• Harris vs SIFT?

• RANSAC steps?

Week 8:

• Give two example types of distortion camera calibration aims to address?

• Describe two internal characteristics of the camera?

• How many points to solve the F matrix?

• What is the fundamental matrix?

Week 9:

• Define texture synthesis?

• Define texture transfer?

• Image quilting vs parametric image synthesis. Two pros of image quilting. Two pros texture synthesis?

• In the active contours domain, what’s the effect of changing alpha and beta?

Week 10:

• Explain the autoencoder?

• What's the distinction between an autoencoder and variational autoencoder?

• How does a GAN work?

• How to test for variety of GAN output images?

• Quality of GAN output images?

Week 11:

• What is the k in k-means?

• One advantage of mean-shift over k-means clustering?

• In region merging what factor is considered when merging over-segmented regions?

• Advantage of normalised cuts?

• Semantic vs instance segmentation?

Week 12:

• In the context of object detection what does a False positive mean?

• What is Recall?

• What is the difference between micro-average and macro-average?

• Explain IoU?

• Horse example for mAP?