Probabilistic Models of the Visual Cortex

Fall 2019 Homework 5

Prof. Alan Yuille

December 9, 2019

Due on Dec 23 11:59pm. Late homework will not be accepted unless permission is obtained well in advance in documented extenuating circumstances.

There is no coding part in this homework. If you have any questions about the homework, email TA Hongru Zhu: hzhu38@jhu.edu.

Questions 1. Interpretable Deep Networks (5 points)

1. Briefly describe 3 ways of understanding deep networks. (3 points)
2. How are VCs extracted and used as semantic part detectors? (2 points)

Question 2. Unsupervised Deep Networks (7 points)

1. Name two strategies of unsupervised learning. (4points)
2. What is the basic idea behind few shot learning? (3 points)

Question 3. Human/Animal Parsing (6 points)

1. Briefly describe two challenges for parsing humans/animals. (2 points)

2. When representing humans with Markov Random Fields MRFs, what are the the nodes of the MRF and how can they be computed? (2 points) What are the pairwise terms? (2 points)

Question 4. Learning by Immagination (4 points)

1. Outline the analogy between graphic rendering engines and the concept of learning by immagination. (4 points)

Question 5. Compositional Models and Theory (6 points)

1. What is one limitation of compositional voting models? (2 points) Why are mixture models useful to solve this issue? (2 points)

2. What is the motivation for part sharing? (1 point) What are hierarchical representations? (1 points)