

Probabilistic Models of the Visual Cortex. Fall 2016. Homework 1

Prof. Alan Yuille

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Due on Thursday 29/Sept. 2016. Email pdf file to `reisinger@cogsci.jhu.edu`

Question 1. Visual Illusions.

Visual illusions teach us about the assumptions that the brain makes when interpreting images. These assumptions are often correct but occasionally wrong, as shown by the illusions. Write a few (two or three) sentences explaining each of the illusions below. Which ones of them involve low-, mid-, or high-level vision? Note that all these illusions are discussed in the Early Vision chapter by Yuille and Kersten.

<http://www.michaelbach.de/ot/mot-ske/index.html>

<http://www.michaelbach.de/ot/mot-motionBinding/index.html>

<http://www.michaelbach.de/ot/lum-adelsonCheckShadow/index.html>

<http://www.michaelbach.de/ot/mot-biomot/index.html>

<http://www.michaelbach.de/ot/col-neon/index.html>

<http://www.michaelbach.de/ot/sze-AmesBallerina/index.html>

http://www.michaelbach.de/ot/fcs_hollow-face/index.html

<http://www.michaelbach.de/ot/cog-kanizsa/index.html>

<http://www.michaelbach.de/ot/col-dress/index.html>

http://www.michaelbach.de/ot/cog_dalmatian/index.html

<http://youtu.be/hdFCJepvJXU>

Question 2. Linear Filtering

This question is to probe receptive field models of neurons, such as Gabor functions and Laplacian of a Gaussian, using sinusoid input. Full description is given at the webpage:

http://nbviewer.jupyter.org/github/drew-reisinger/AS.50.375HWFall16/blob/master/HW1Intro.ipynb?flush_cache=true