This file organizes the demos. This is done by section.

**Section 1:**

*Demo1a* – link to Michael Bach’s webpage: <http://www.michaelbach.de/ot/>

This webpage contains demos of many beautiful optical illusions and visual phenomena. Professor Bach gives detailed descriptions of these phenomena from a theoretical perspective which is similar to the viewpoint expressed in this chapter. He states that “I view these phenomena as highlighting particular good adaptations of our visual system to experience with standard viewing situations. These experiences are based on normal visual experiences, and thus under unusual contexts can lead to inappropriate interpretations of a visual scene (=Bayesian interpretation of perception).” We particularly draw attention to: (i) Hidden Figures, (ii) Rotating Face Masks, (iii) Ames Window, (iii) Neon Color Spreading, (iv) Dress Code Enigma, (v) Adelson’s “Checker-Shadow” Illusion, and (vi) Biological Motion.

*Demo1b: IPython Notebook*.

Introduces the IPython Notebook. These are the tools needed for the interactive demos in the later sections. The demos includes modifiable codes for processing images.

Weichao: http://www.nature.com/news/interactive-notebooks-sharing-the-code-1.16261

**Section 2:**

*Demo2a: Convolution Demo*. This demo introduces linear filters and convolution.

*Demo2b: Gabor Demo.* This demo introduces Gabor filters. (Weichao(done) edit -- remove references to Stat 271, and remove the answers)

*Demo2c: PCA and Oja’s rule.* This demo illustrates Principal Component Analysis, and Oja’s rule. (Note: Weichao(done) edit to remove the first half – everything before PCA . The first half become demo 3a in the next section).

**Section 3**:

*Demo3a: Natural Image Statistics.* First half of Natural Image Statistics (which was Demo 2c).

*Demo3b: Statistical Edge Detection.* This demo illustrates decision theory using edge detection as an example.

**Section 4:**

*Demo4a: Gibbs Sampling***.** This demo illustrates Gibbs sampling which serves as a simplified model of stochastic neurons.

*Demo4b: Mean Field Theory*. This demo describes mean field theory which relates to deterministic neural network models and Hopfield networks. (Weichao edit).

*Demo4c: Hopfield Network for Binocular Stereo*. This demo applies a Hopfield network (mean field theory) to binocular stereo. (Weichao(doing) edit file – Alan edits chapter to explain that this Hopfield is a special case of MFT).

**Section 5:**

*Demo5: Cue Combination.* This demo shows how cues combine weighted by their uncertainty as their variances change.