PSY801 Sensation and Perception

Fall 2017

Instructor: Taosheng Liu
Meetings: Tuesday 1:50-4:40, Room 287 Psychology Bldg
Office hours: By appointment

Readings:
2. Additional original research articles (see reading list below).

Course description and objectives
This course focuses on visual perception. Vision is arguably the most important sense for humans and it has been studied since the very beginning of psychology and physiology. Today, vision science is an interdisciplinary effort of investigation that spans several fields: psychology, neuroscience, and computer science. Scientists from these various disciplines address the same question from different perspectives: how do we see? As you will discover, the answer to this seemingly innocent and simple question is far from simple. Underneath the apparent ease of seeing is an amazingly complex and intricate machinery and associated computations. Although far from complete, our knowledge of vision is by far the most comprehensive among all cognitive functions, and vision remains the “best shot” for scientists to gain a true understanding of how (a piece of) the mind works. This course will survey our current understanding of visual processes from the psychological, physiological, and computational perspectives. The goal is to provide an appreciation of our increasingly integrated, coherent understanding of visual perception from multiple levels of analysis.

Prerequisite: It is not necessary to have specific preparation for this course. Indeed it is hard to have all the relevant preparation for a diverse topic such as vision science. However, some knowledge about the following will be useful: psychophysics, perception (undergraduate level), cognitive psychology, neuroanatomy and neurophysiology, math (calculus, linear algebra, probability and statistics).

Course requirement and assessment
Class participation 15%
Weekly write-ups  20%
Presentations  15%
Mid-term exam  25%
Final exam  25%

Participation and write-ups: I fully expect everyone will attend every class session, and actively participate in the discussion. To facilitate our discussion, you are to write a short reaction paper every week (except the first week). Feel free to write (some of) your thoughts about that week’s reading. Some examples of what to write about: what are the most important/interesting things you learned from the reading? Is the reading clear, or something needs to be explained in more detail? How does the information fit with your previous knowledge? What are the outstanding questions that remain to be addressed? At the end of your paper, you should write down 2-5 questions for group discussion, things that you think are interesting and you would like to hear other’s opinion. Aim for somewhere around 500 words (but definitely no more than 1000 words). Submit your paper on D2L by 1 day prior to class (i.e., by 12 noon on Mondays).
Presentations: Students are expected to present readings of research articles and lead the discussion of those readings.
Exams: There will be two take-home exams, with mostly essay type of questions.

Class schedule

<table>
<thead>
<tr>
<th>Wk</th>
<th>Date</th>
<th>Topic</th>
<th>Reading (VS: Palmer)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sept 5</td>
<td>Introduction</td>
<td>VS Ch 1; linear system intro</td>
</tr>
<tr>
<td>2</td>
<td>Sept 12</td>
<td>Theoretical frameworks</td>
<td>VS Ch 2; (1-4)</td>
</tr>
<tr>
<td>3</td>
<td>Sept 17</td>
<td>Signal detection</td>
<td>VS appendix A; SDT handout; (5-7)</td>
</tr>
<tr>
<td>4</td>
<td>Sept 26</td>
<td>Image structure</td>
<td>VS Ch 4; (8, 9)</td>
</tr>
<tr>
<td>5</td>
<td>Oct 3</td>
<td>Color and Motion</td>
<td>VS Ch 3, Ch 10; (10)</td>
</tr>
<tr>
<td>6</td>
<td>Oct 10</td>
<td>Depth</td>
<td>VS Ch 5; (11, 12)</td>
</tr>
<tr>
<td>7</td>
<td>Oct 17</td>
<td>Crowding</td>
<td>(13-15)</td>
</tr>
<tr>
<td>8</td>
<td>Oct 24</td>
<td>No class, mid-term exam due</td>
<td>mid-term exam due</td>
</tr>
<tr>
<td>9</td>
<td>Oct 31</td>
<td>Dorsal vs. ventral streams</td>
<td>(16-19)</td>
</tr>
<tr>
<td>10</td>
<td>Nov 7</td>
<td>Perceptual organization</td>
<td>VS Ch 6; (20-22)</td>
</tr>
<tr>
<td>11</td>
<td>Nov 14</td>
<td>Object properties and shape</td>
<td>VS Ch 7, Ch 8; (23, 24)</td>
</tr>
<tr>
<td>12</td>
<td>Nov 21</td>
<td>Function and category</td>
<td>VS Ch 9; (25, 26)</td>
</tr>
<tr>
<td>14</td>
<td>Nov 28</td>
<td>Attention &amp; Awareness</td>
<td>VS Ch 11, Ch13; (27)</td>
</tr>
<tr>
<td>15</td>
<td>Dec 5</td>
<td>Memory &amp; Imagery</td>
<td>VS Ch 12; (28-30)</td>
</tr>
<tr>
<td>16</td>
<td>Dec 11</td>
<td>Final exam due</td>
<td></td>
</tr>
</tbody>
</table>
Reading List (papers will be posted on D2L)