ECE418
Introduction to Image and Video Processing
Spring 19

Lectures: Tue. Thu. 12:30 PM - 1:50 PM 2015 ECEB
Lab: Fri. 2:00 PM - 6:00 PM ENGR 406B1

Instructor: Shuai Huang (huang816@illinois.edu) 124 CSL
Instructor Office Hours: Mon. 1:30 PM - 3:00 PM 124 CSL
By appointment (send me email)

Teaching Assistant: Zubin Pahuja (zpahuja2@illinois.edu)
TA Office Hours: Mon. 5:00 PM - 7:00 PM 4036 ECEB

Web Site: https://courses.engr.illinois.edu/ece418/sp2019/

Textbook: Instructor’s notes by Prof. P. Moulin.
The following books are on reserve in the Grainger Library:
M. Ghanbari, *Video Coding - an introduction to standard codecs*, IEE Telecommunications Series, 1999

Grading: (subject to change)

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<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Lab</td>
<td>25%</td>
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<tr>
<td>HW</td>
<td>10%</td>
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<tr>
<td>HW usually due on Thursdays in class</td>
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<tr>
<td>Midterm 1</td>
<td>15%</td>
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<td>Midterm 2</td>
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<td>Final</td>
<td>35% or 20%</td>
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<td>Optional Project</td>
<td>0 % or 15%</td>
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Exams: Schedule

<table>
<thead>
<tr>
<th>Exam</th>
<th>Date</th>
<th>Time</th>
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<tbody>
<tr>
<td>Midterm 1</td>
<td>Wed. 02/27/2019</td>
<td>7:00 PM - 8:30 PM</td>
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<tr>
<td>Midterm 2</td>
<td>Wed. 04/03/2019</td>
<td>7:00 PM - 8:30 PM</td>
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<td>Final</td>
<td>Fri. 05/10/2019</td>
<td>8:00 AM - 11:00 AM</td>
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1 Overview of the course

1. Multidimensional Signal Processing (∼ 5 lectures)
   Multidimensional Fourier Transform, sampling and filtering (including decimation and interpolation)

2. Human Visual Perception (∼ 3 lectures)
   Human Visual System, visual masking, noise visibility, color vision

3. Image Scanning and Display (∼ 2 lectures)
   Acquisition and Display of images (camera, digitizers, film, printers); sampling and quantization issues

4. Video Scanning and Display (∼ 3 lectures)
   Monochrome and Color TV, videoconferencing, videophone

5. Image Enhancement (∼ 4 lectures)
   Contrast and color adjustment, noise reduction, edge enhancement

6. Image Compression (∼ 4 lectures)
   How to reduce bit rate while maintaining acceptable quality

7. Video Compression (∼ 3 lectures)
   Role of Motion; compression techniques

8. Image Analysis (∼ 3 lectures)
   Edge Detection, Texture, Image Segmentation