ECE 6364 *Digital Image Processing*

Course website: http://www.uh.edu/~hebert

Pre-Req: ECE 6342 Digital Signal Processing

Time/Place: 8:30-9:50 am TTh rm W205-D3

Instructor: Dr. Tom Hebert, office-N316.
713-743-4448, thebert@uh.edu

Office Hrs: TTh, 1:00-2:00 pm, or email me.

Course Text: Approximately 20 handouts.

Reference Texts: Digital Image Processing - Jain;
and Digital Imag Proc- Gonzalez&Woods

1st class meeting: Tues Jan 19 (28 class meetings).

Last day to drop with no grade: Tues 1/26.

Semester holidays: Spring Break Mar 14-18.

Last day to drop with a grade of W: Wed March30.

Last class meeting: Thursday April 28.

Midterm exam: Thurs March 10.

Final exam: to be announced: Th Apr 28, or Tues May 3.

Grade weightings: HWs (3%), short projects (4%) Midterm (44%), Final (49%).

Topics	**Ref Text - Jain**
Image representations, connectivity	1.1-1.7, 2.2
Matrix theory, probability	2.4, 2.7, 2.8
2-D convolution, sampling	2.3, 4.2, 4.4
quantization (covered in ECE 5354)	4.5-4.6
contrast, histogram equalization	7.1-7.3
smoothing, unsharp masking	7.4
edge detection	9.4, notes
2-D system theory	2.3, handout
unitary transforms	5.1-5.3
1-D and 2-D Unitary DFT	5.4-5.5
2-D convolution via transforms, diagonalization	5.5, notes
Sine, cosine, KL transforms	5.6-5.7, 5.11
SVD transform	5.13, notes
Wavelet transform	Handout, notes
Image degradation models, image sensor models, image restoration	8.1-8.2
Restoration: inverse filtering, least squares	8.3
Pseudo-inverse restoration, ART algorithm	8.9, notes
Restoration via Wiener filtering	8.3-8.6, notes
Optimal methods for restoration	notes
Maximum likelihood restoration	8.15
Maximum a posteriori restoration	
Detecting structure in images - morphological processing	9.9
Dilation, erosion, open, close operations	9.9
Hit-miss and skeleton transforms	9.9

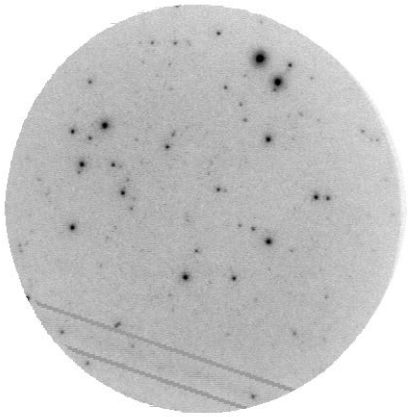

Figure 1. Image of a Leonid meteor (a minute particle from a comet's tail) entering the atmosphere as seen through a 3-meter telescope. The meteor is shown between two straight lines as it streaks across the field-of-view of the telescope in 1/100th of a second.

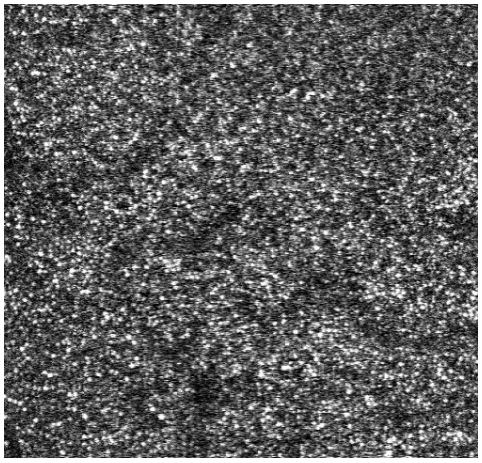

Figure 2. Image of a 7x7 mm square area of the human retina obtained using a scanning laser opthalmoscope. The small round bright objects are photoreceptor cells that capture light in the eye.

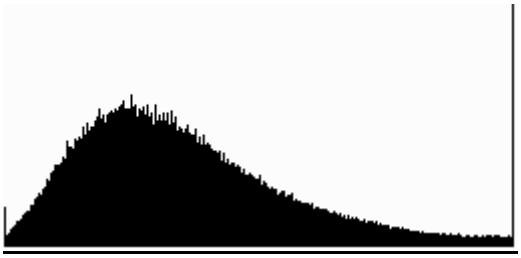

Figure 3. Histogram of figure 2.