Math 155, Spring 2004, Vese

Midterm exam: Monday, May 17, 2004, 1-1.50pm

Topics and sections covered for the midterm:
- a simple image formation model 2.3.4
- image sampling and quantization 2.4.1, 2.4.2, 2.4.3, 2.4.5
- image enhancement in the spatial domain 3.1, 3.2, 3.3 (including 3.3.1, beginning of 3.3.2, 3.3.4), 3.4.1, 3.4.2, 3.5, 3.6, 3.7
- image enhancement in the frequency domain 4.2, 4.3 (except 4.3.4), 4.4, 4.5, 4.6.1, 4.6.2, 4.6.4

Examples of theoretical questions:
- explain the histogram equalization technique
- explain zooming or shrinking using bilinear interpolation
- what is the nth moment of a random variable r, about its mean ?
- explain the spatial linear filtering method with a 3x3 mask (or with an nxn mask).
- explain the median filter
- explain enhancement using the Laplacian
- How is the Laplacian defined ? Give an example of an approximation of it
- Give an example of edge detector
- questions about the definition and properties of the Fourier transform
- describe filtering in the frequency domain
- What is the convolution theorem ?
- give an example of a lowpass frequency filter
- give an example of a highpass frequency filter
- etc.

Additional questions and exercises from the problems from the end of each chapter and from the homework assignments.