CSCI–4190 Introduction to Robotic Algorithms, Spring 2006
Assignment 2 written questions (part I): out February 16, due February 23

Your answers to these questions must be turned in on hardcopy in class (or to my mailbox in the CS main office in Lally 207) by 10:00am on Thursday February 23. Please note that no late papers for these questions will be accepted as I will post solutions immediately after class.

1. Assume the following covariance matrix is for a two dimensional Gaussian distribution.

$$\begin{bmatrix} 7 & -3\sqrt{3} \\ -3\sqrt{3} & 13 \end{bmatrix}$$

   What is the angle (from the x axis) to the major axis of the elliptical confidence bounds for this distribution. Assuming $k = 1$ in Equations 5.26 and 5.27, calculate the radii of the major and minor axes of the ellipse.

2. Write out the form of the Jacobian J_H. (See Equation 6 in the assignment handout for examples of Jacobians.) Explain what each term is. (Relate it to the sensor or measurement process, not just "this is the derivative of a with respect to b.") Explain how you would compute/calculate these derivatives. (You do not have to actually calculate these derivatives, as it is a little tedious. (I have already done this for you in the support code.)