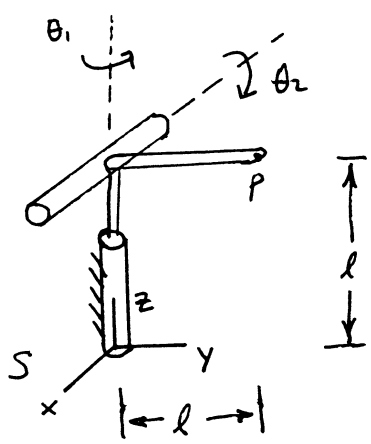
EE/BioE C125 Problem Set 3
Assigned 9/27/05; Due 10/4/05

1. Look at:

`http://ranier.hq.nasa.gov/telerobotics_page/coolrobots.html.`

Pick a cool robot from the archives, or from other another web source, conference proceedings, etc., and write a short paragraph about why it interests you. Feel free to pick a robot from any year of the archives. Since the cool robot pages haven't been updated since 2003, you might poke around on your own a bit and see what you can find on the web. I've put up a few links students have given me on WebCT. You could also check out proceedings from some of the major (or minor) robotics conferences. Try IEEE International Conference on Robotics and Automation (ICRA), IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), International Conference on Advanced Robotics (ICAR), or there are many others. Have fun, find something unusual and interesting!

2. Use Paden-Kahan subproblem 2 to find $\theta_1$ and $\theta_2$ necessary to rotate an initial point $p = \begin{bmatrix} 0 \\ l \\ l \end{bmatrix}$ to a final position $q = \begin{bmatrix} -l/\sqrt{2} \\ 0 \\ l + l/\sqrt{2} \end{bmatrix}$.




3. Show how you would solve for the inverse kinematics of the 6 DOF manipulators shown in Figure 3.24 (ii) and (iv) given a desired $g_d$. Show which subproblems you would solve and which points you would use to solve them (or how you would use geometric reasoning instead of one or more of the subproblems). How many solutions are possible?

4. Problem 7, page 149 in MLS. Use subproblem 5 to solve the inverse kinematics of the Stanford manipulator in Figure 3.24 (iii) *instead* of the SCARA. As in problem 3, show the subproblems you would use, which points, and how many solutions are possible.