MATLAB Assignment

ME451

October 19, 2010

Problem 1. Implement MATLAB code that computes for an x-absolute driving constraint all the information needed to carry out Kinematics Analysis. Specifically, the MATLAB routine[s] should be able to evaluate the expression of the algebraic equation defining the constraint; i.e., evaluate $\mathbf{\Phi}(\mathbf{q}_i, \mathbf{q}_j)$, $\mathbf{\Phi}_{\mathbf{q}}$, ν, and γ. Note that you will need to pass as an argument of your MATLAB function another function that is meant to provide at each time instance t the value $C(t)$ in $x_i^P - C(t) = 0$. Also note that by taking the term $C(t) = \text{const.}$, you effectively obtain the x-absolute geometric constraint.

Problem 2. Like for problem 1, yet this time the MATLAB routine[s] should deal with the y-absolute driving constraint. Note that you will need to pass as an argument of your MATLAB function another function that is meant to provide at each time instance t the value $C(t)$ in $y_i^P - C(t) = 0$. Also note that by taking the term $C(t) = \text{const.}$, you effectively obtain the y-absolute geometric constraint.

Problem 3. Like for problem 1, yet this time implement a similar set of MATLAB routines for the revolute rotational driver. As discussed in class and without any loss of generality, assume that $\theta_i = \theta_j = 0$.

Remark: Please see the slide "MATLAB: How to Handle Arbitrary Motions" for an example of reading in and subsequently manipulating $C(t)$ above.