

16-741 Mechanics of Manipulation

Fall term, 2019

Assignment 1, Out: 11 September 2019

Due: 18 September 2019

From the text, do exercises 2.2, 2.4 and 2.7.

(For 2.4 the motions are not continuously varying motions, and the centrode will not be a smooth curve, it will be a “central polygon”. In general, the moving central polygon and the fixed central polygon are each a sequence of vertices, which you can join with lines if you like. Vertices can be repeated, the polygon can cross itself. It need not be a closed polygon.)

(For 2.7, how you generate the centrodes is up to you. You can do it manually: draw the mechanism in several different configurations, densely sampling all of its configurations. For each configuration, plot the IC. The centrode is an interpolating curve. It’s easy to get the fixed IC this way. To get the moving IC, you will have to plot the ICs in the moving plane, which you can do by attaching a piece of acetate or tracing paper to the coupler link. Or you can write code using for example Geogebra or Matlab.

Note that postscript files for the figures may be found online at

<http://www.cs.cmu.edu/~mason/ftp/MoRMFigures/FiguresRenamed/>