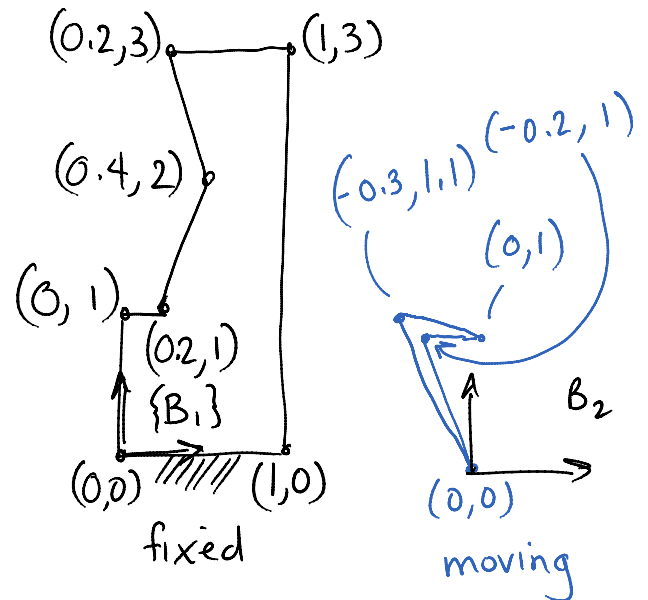


50 pts

1.) Approximate the Cobs for the pair of polygons on the right.

a.) Use random sampling.

Hint: Use Matlab's "inpolygon" function and random number generator to choose elements of $SO(2)$ for the moving polygon. Use plots to plot points in Cobs.



b.) Use a van der Corput sequence to generate points in $SO(2)$. Which method uses fewer points for roughly the same level of accuracy of the Cobs?

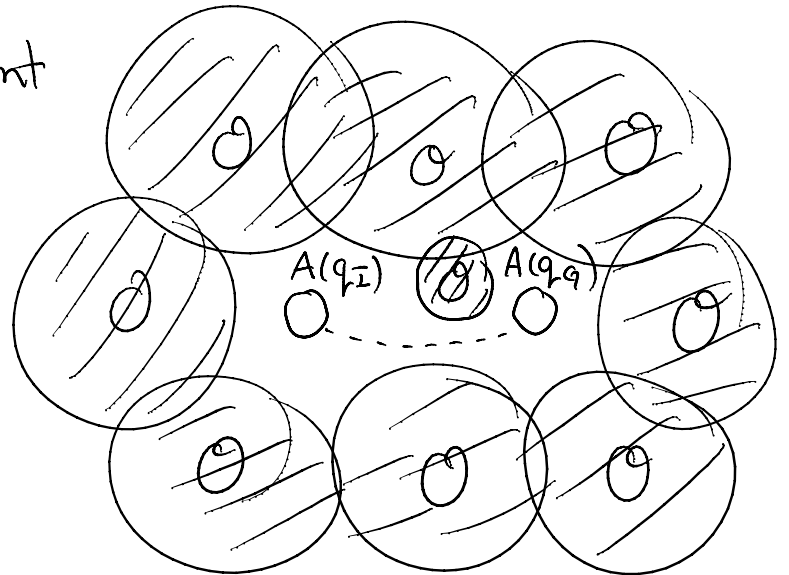
Extra credit (+10% of value of problem 1)

c.) See if you can find a heuristic to get the same

level of accuracy with fewer points.

2.) 50 pts Construct an environment that will have a narrow passage in C_{free} .

a.) Implement PRM (no dynamics) or RDT[^] and compare solution times as a function of gap size in world environment.



Example env. constructed from discs. You can use other primitives if you like.

Extra credit (20% of value of problem 2.)

b.) Implement RDT using LCP time-stepping w/ no friction. Compare performance with the method you implemented in part 2a.