

## ASSIGNMENT 6

Acknowledge your sources. Don't copy. Please hand in your assignment on paper.

1. Guibas and Yao proved in 1983 that for any set of disjoint convex polygons in the plane and any direction, the polygons can be separated from each other by translating them one-by-one parallel to that direction vector. The moving polygon may not intersect any of the other polygons.
  - (a) Show that the same is NOT true in 3 dimensions.
  - (b) Prove or disprove that a collection of disjoint spheres in three dimensions may be separated one at a time by translations parallel to any given direction.
2. Design a polynomial time algorithm to find a path from point  $s$  to point  $t$  among disjoint disc obstacles in the plane. Do not invest too much energy in the best run time, but do be sure to justify correctness. Give a high-level description of your algorithm, not detailed pseudo-code.