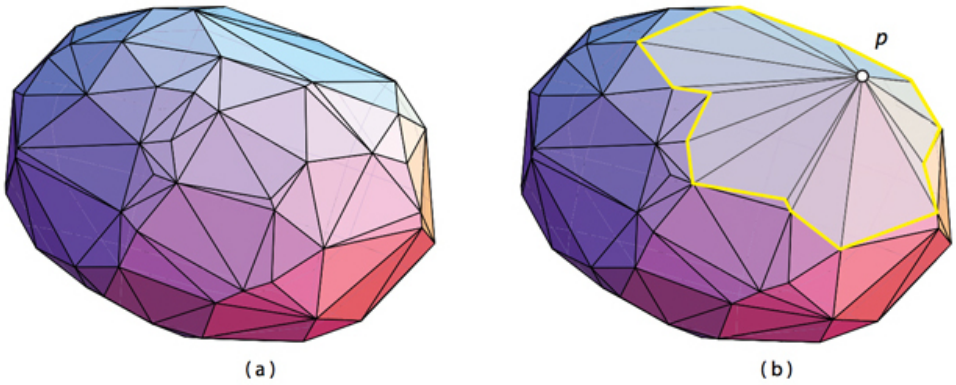
Convex Hulls in 3D

MATH 261 Computational Geometry

1. We can specify a 2D convex hull by a list of points, in order, around the convex hull. How can we specify a 3D convex hull in the memory of a computer? What data is required?

2. How does the incremental algorithm extend to 3D? Specifically, if you have a 3D convex hull H and a point p outside of H, what steps are required to compute the convex hull of $H \cup p$?



3. How does the divide-and-conquer algorithm extend to 3D? Specifically, if you have two disjoint 3D convex hulls A and B, what steps are required to compute the convex hull of $A \cup B$?

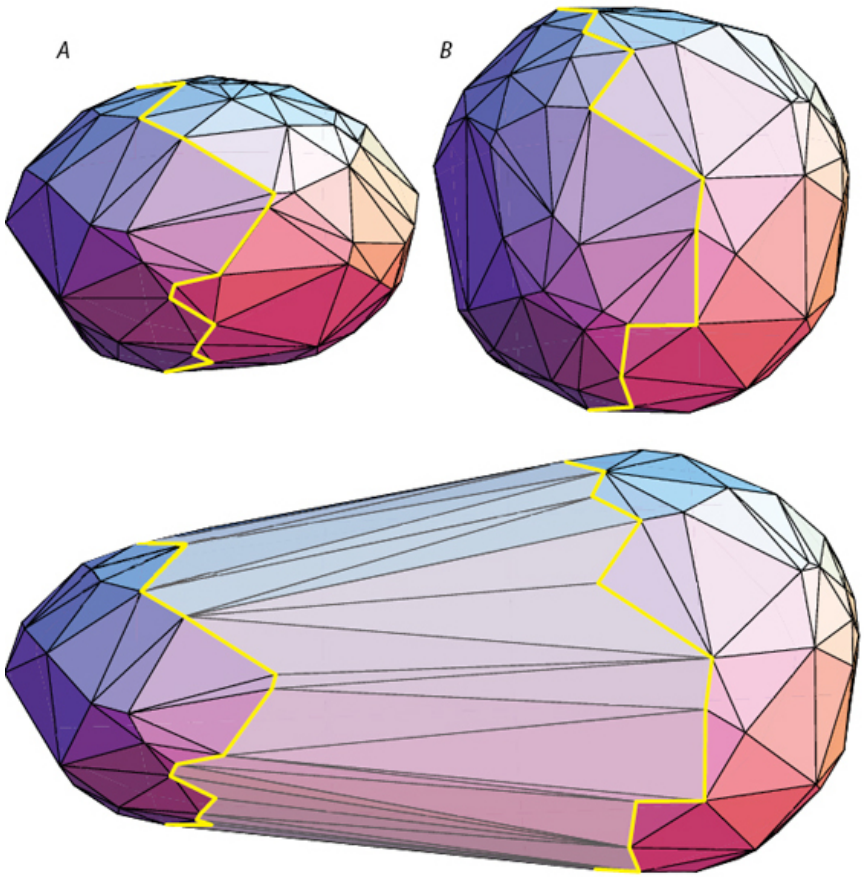


image credit: Devadoss and O'Rourke, *Discrete and Computational Geometry*