

What does it mean to sweep a shape?

Imagine a shape filled with crumbs. Using orthogonal or slanted sweeps, we push all of the crumbs into a single point. The sweep cost is defined as the distance that the sweeper moves.

Restricting our attention to two-sweeps and triangles, the minimum sweeping cost is always achieved by enclosing the triangle in a minimum perimeter parallelogram. against at least one edge of the convex hull. [Mitchell and Polishchuk 2006]



All enclosing parallelograms for obtuse triangles.

The best way of sweeping a shape is not necessarily achieved with two sweeps:

However....

Conjecture: Minimal cost sweeping can be

Plot of our flush function, a cubic equation with *b* as a function of *a*.



An example requiring three sweeps.

achieved with two sweeps for any convex shape.