**Introduction**

- **Goal:** Fast and automatic **signed** distance field computation for arbitrary triangular geometry
- **Input:** Polygon soup geometry
- **Output:** Define and compute signed distance field

**Step 1: Unsigned Distance Field**
Input Geometry Tri: 1,847,976
Unsigned Distance Field

**Step 2: Compute Isosurface Mesh**
Marching Cubes

**Step 3: Remove Interior Components**
Rapid Detection of Interior

**Step 4: Fast Signed Field Computation**
\[ d_S(X, E_\sigma) = d_U(X, \Omega) - \sigma \geq 0 \]

**Results**
1024x1024x1024 signed distance fields
(a) Excavator bucket
(b) Dragon
(c) Turtle
(d) Skeleton

**Applications**
Collision detection (polygon soup geometry)
Tet meshes for FEM simulation