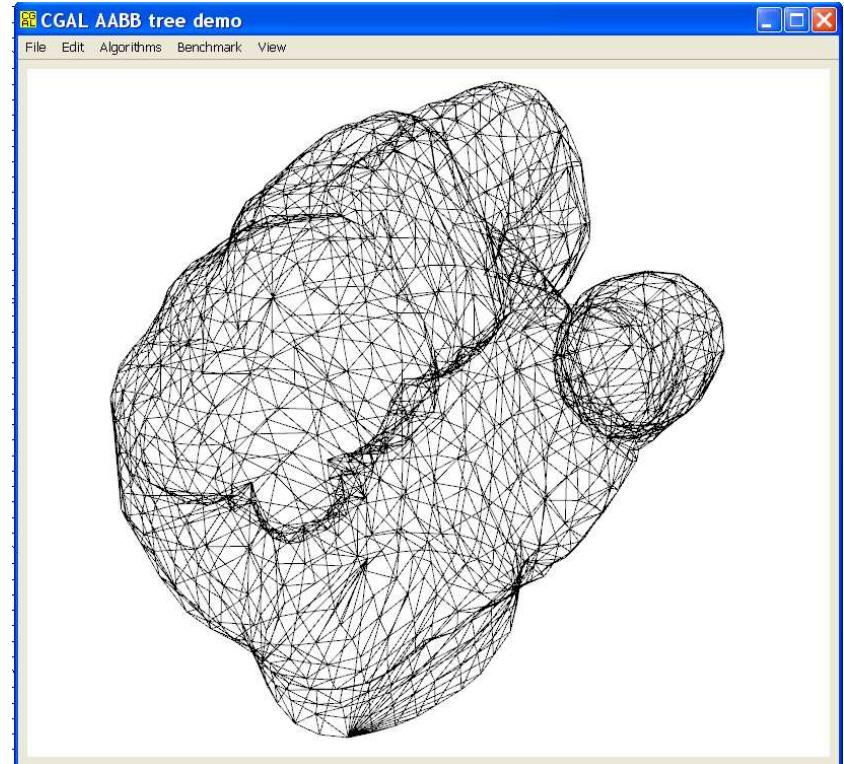


AABB tree demo

The AABB tree demo showcases several algorithms where the AABB tree is put at work with polyhedron facet and edge primitives. It also provides a menu for benchmarking so that the user can quickly get an order of the performances for both intersection and distance queries.

The application accepts as input (and through drag & drop) OFF files which represent triangle surface meshes. The main window displays the input triangle surface mesh in wireframe mode and allows interaction through an arcball.

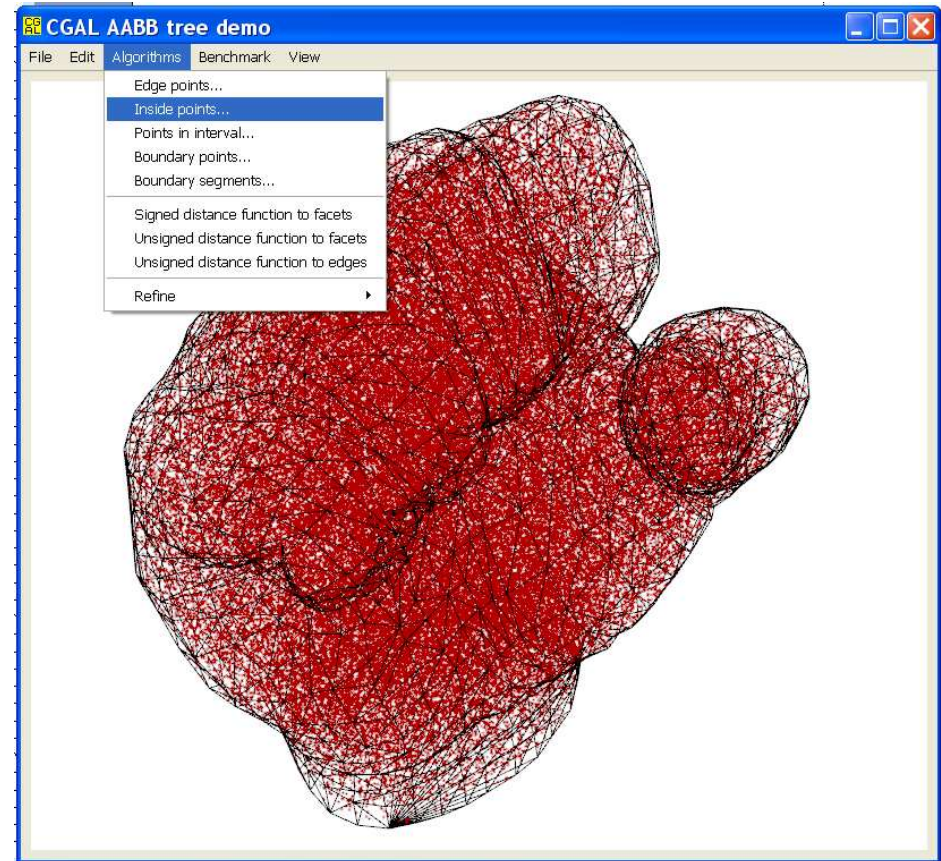


Inside Points

Menu Algorithms / inside points allows the user generating a specified number of points inside the input surface mesh (which is assumed to be intersection free and without boundary).

The demo constructs an AABB tree with the mesh facets and generates many intersection queries with randomly generated rays (the source of each ray is randomly chosen inside the mesh bounding box and the direction is arbitrarily chosen for all rays).

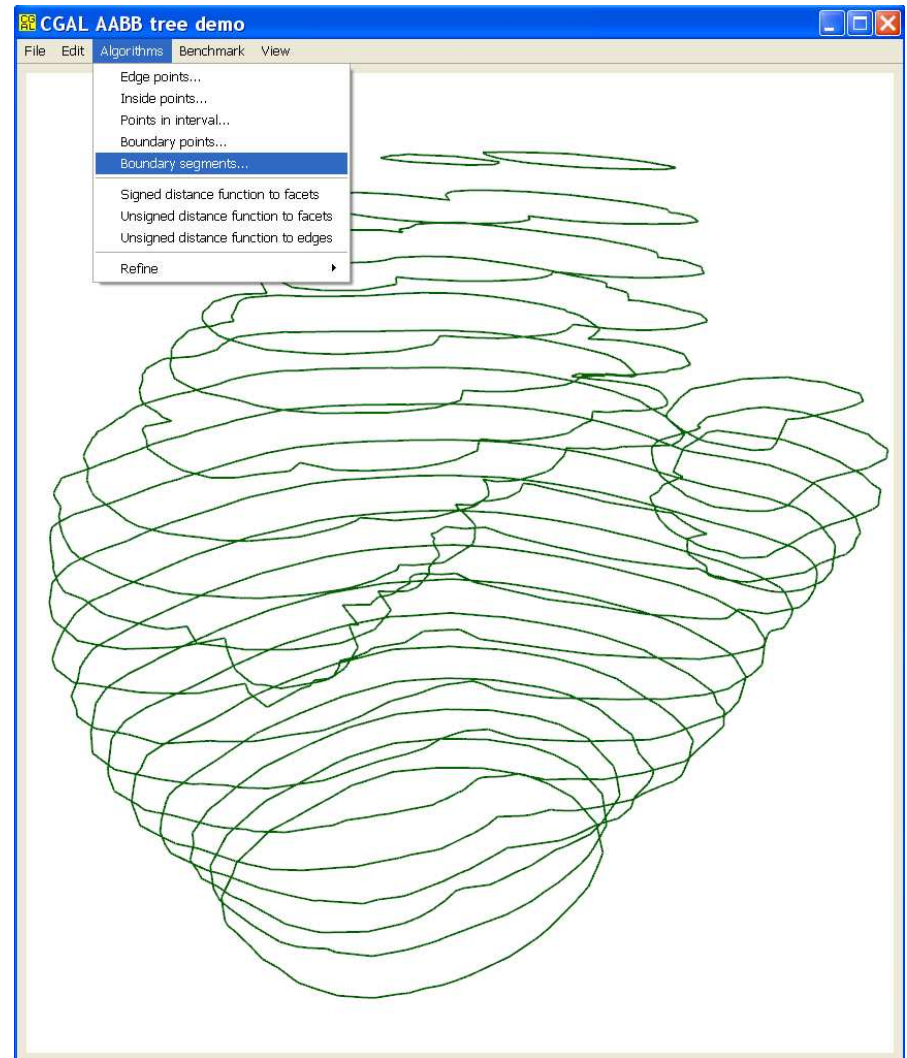
Each query counts the number of intersection between the ray and the input mesh in order to determine whether the ray source point is inside or outside (inside if odd, outside if even).



Boundary Segments

Menu Algorithms / boundary segments allows the user generating a specified number of (horizontal) slices from the input surface mesh.

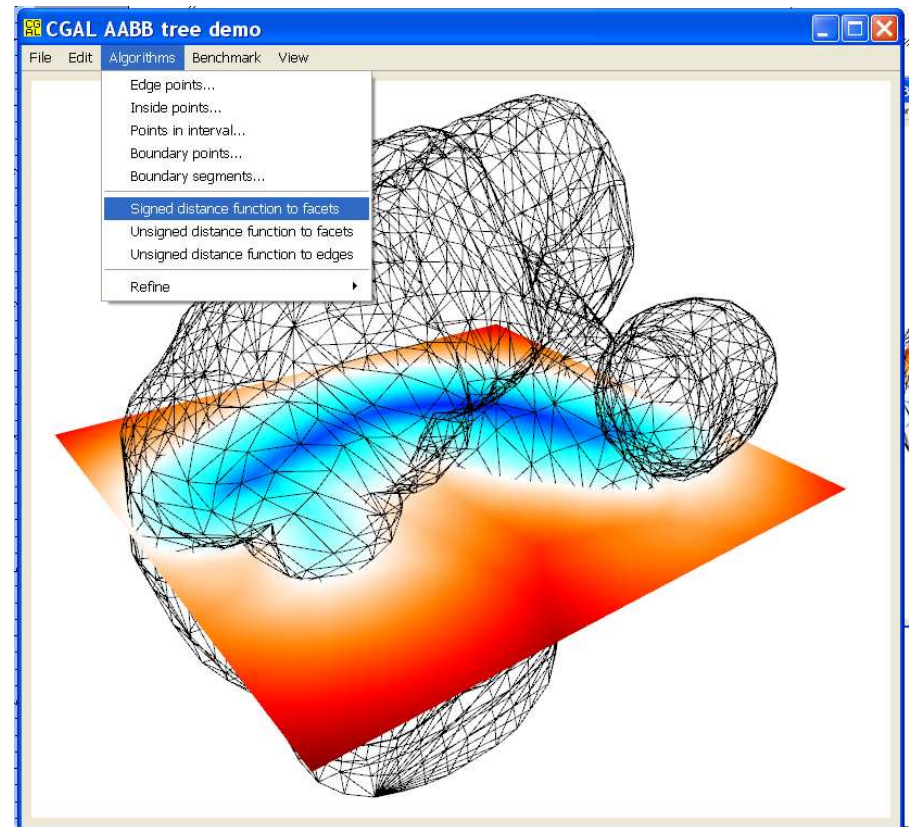
The demo constructs an AABB tree with the mesh facets and generates many intersection queries with a set of horizontal planes. The objects returned (generally segments) are depicted in green.



Signed Distance Function

Menu Algorithms / signed distance function to facets allows the user generating a cross section image (100x100) of the signed distance function to the input surface mesh facets.

The demo constructs an AABB tree with the mesh facets and generates within the cross section a number of distance and intersection queries with points and rays. As for the “inside points” menu each ray query counts the number of intersection to determine the sign of the distance (inside versus outside) while each distance query determines its magnitude.



Unsigned Distance Function

Menu Algorithms / unsigned distance function to facets allows the user generating a cross section image (100x100) of the unsigned distance function to the input surface mesh facets.

The demo constructs an AABB tree with the mesh facets and generates within the cross section a number of distance queries with points.

(another menu provides the same functionality but for the mesh edges)

