Unsigned distance function

# Mesh

Define a Mesh that has vertex Points and Triangular faces as

# Pointwise distance

Q is query point. is maximum truncated distance.

# Facewise distance

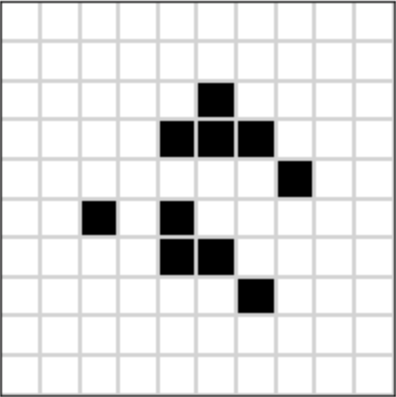
Q is query point. is maximum truncated distance.

Figure 1 Space map showing spatial indexing of points

# Brute force approach

Go over all the points and faces to find the minimum possible distance between target point and mesh points.

# Spatial indexing approach

Recommended approach of indexing is using octree, but in our case were going to implement a simple space map to Spatially Index the mesh points. After indexing, find all the points and faces in a sphere to minimize list of candidate Points to search.