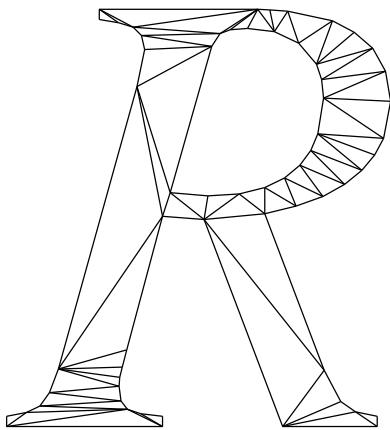


Mesh Generation Using Relaxation in Warped Space

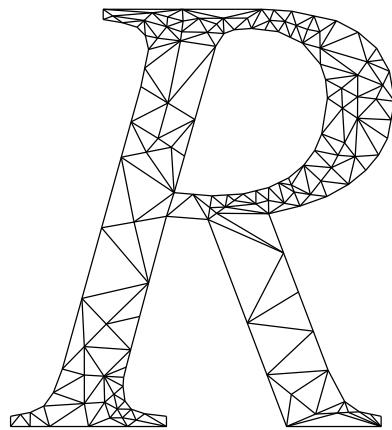
Paul Heckbert
Carnegie Mellon University

Frank Bossen
Swiss Federal Institute of Technology

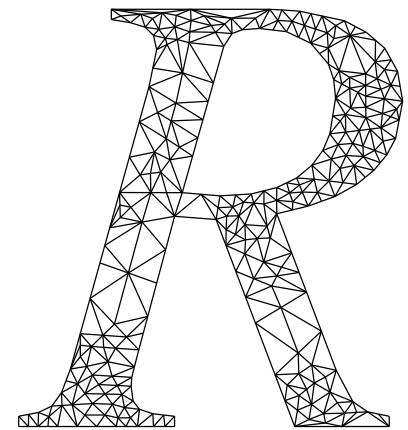
Isotropic mesh generation



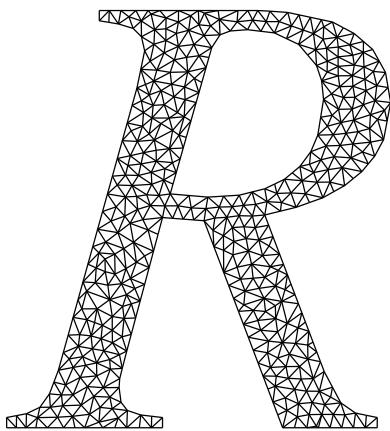
Initial triangulation



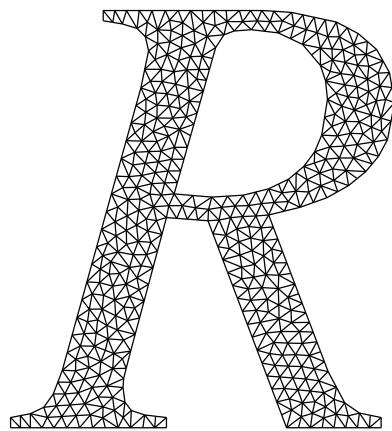
100 iterations



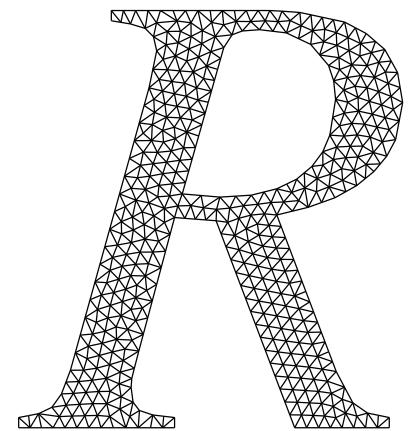
300 iterations



1000 iterations

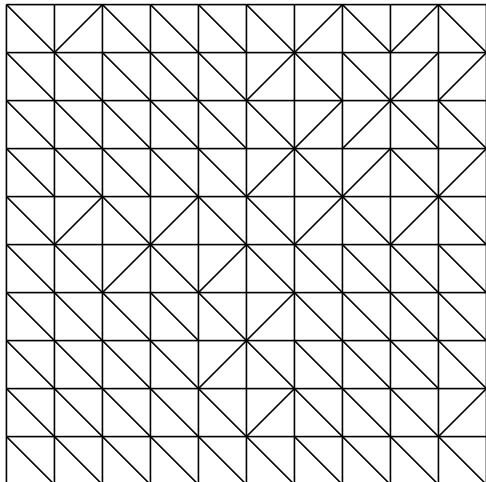


3000 iterations

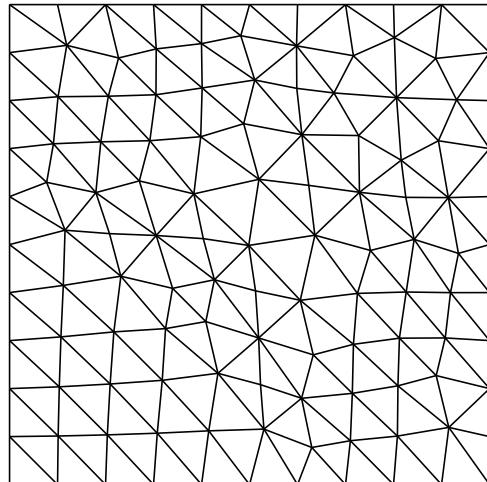


11657 iterations

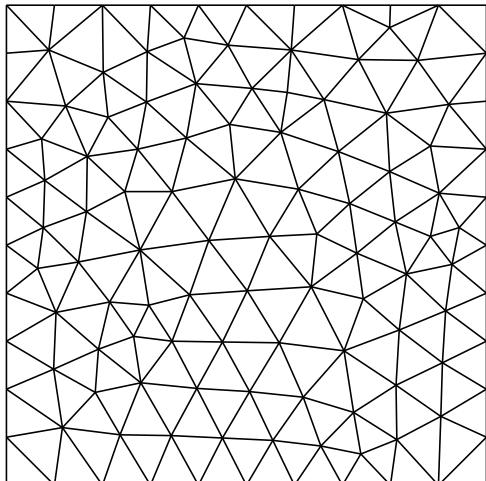
Mesh smoothing



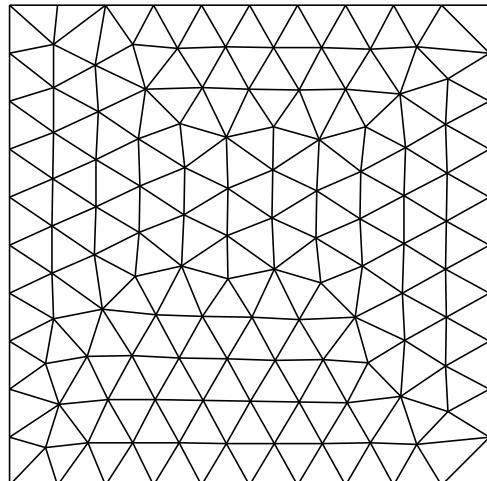
Initial mesh



Laplacian

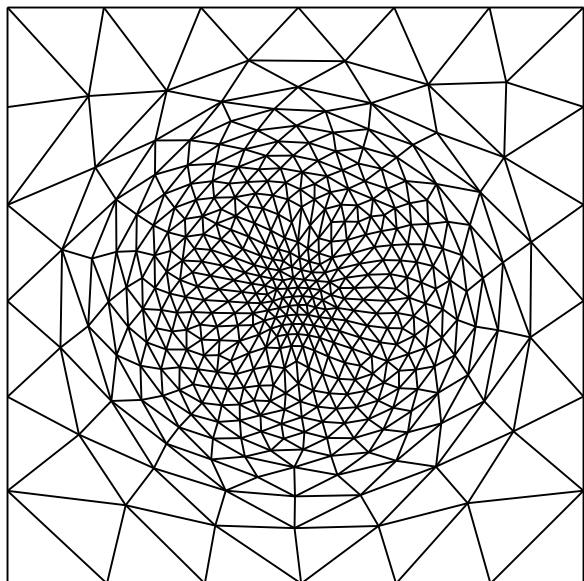


Laplace-Delaunay

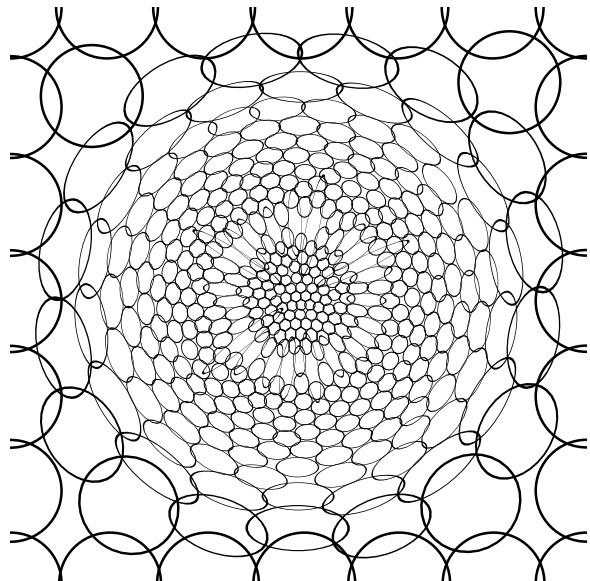


Ours

Anisotropic approximation of a Gaussian

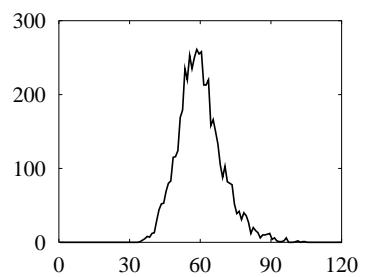
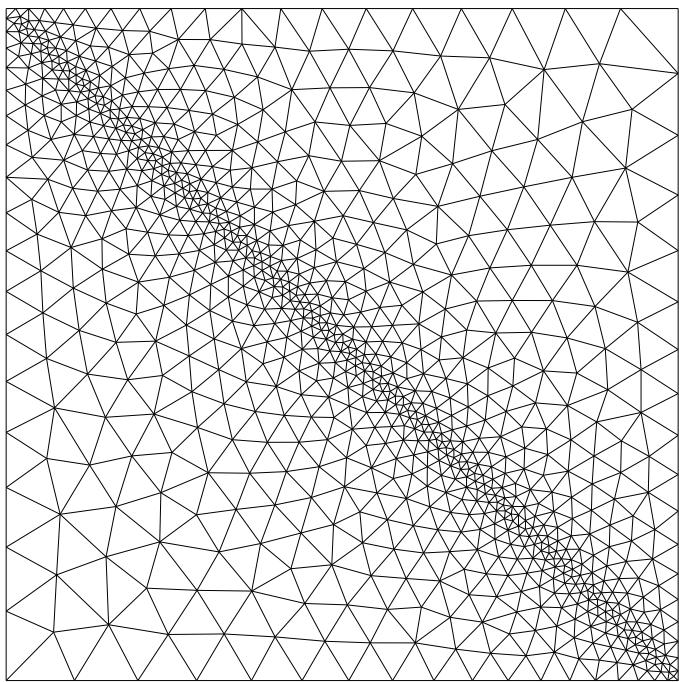


Mesh, 430 nodes

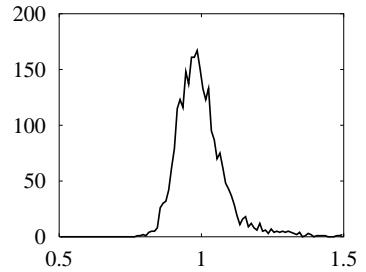


Ellipse around each node

Isotropic mesh

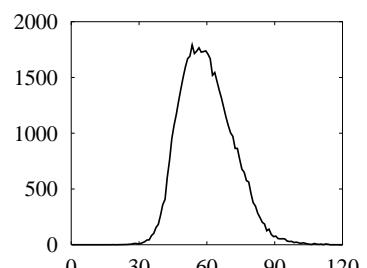
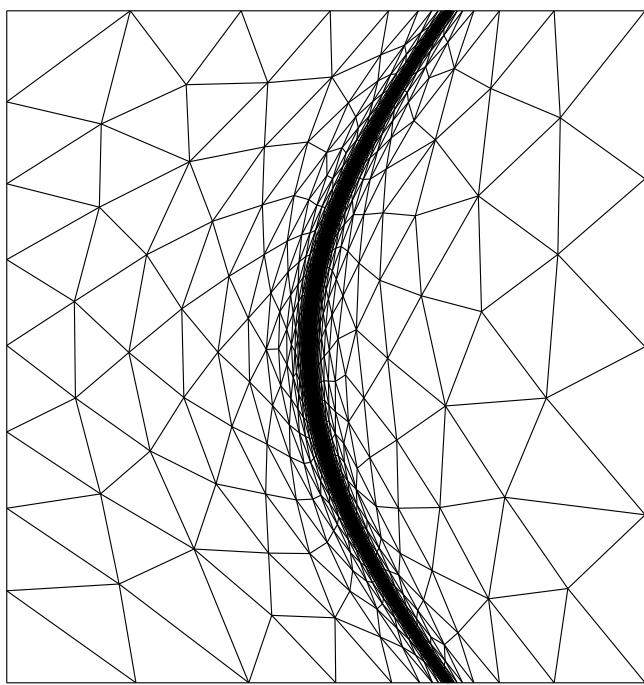


Angle histogram

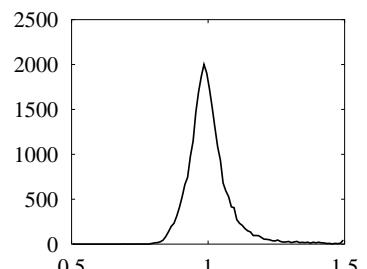


Edge length
histogram

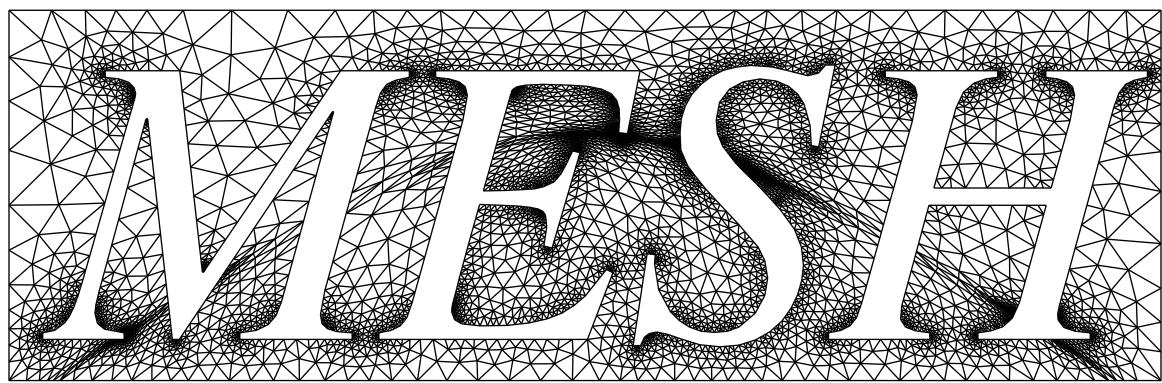
Anisotropic mesh: shock front



Angle histogram



Edge length histogram



<http://ltswww.epfl.ch/~bossen>

Mesh generation algorithm

inputs: boundary and element size function

create initial constrained Delaunay triangulation

until all nodes inactive

 randomly pick an active node i

 reposition node i according to positions of neighbors

 retriangulate to satisfy Delaunay criterion

 if extent of node i is too low, delete it and retriangulate

 else

 find extents of adjacent edges

 if largest edge extent is too high, split edge and retriangulate

 update active/inactive flags of node i and its neighbors

output: triangle mesh