V. Three-dimensional Meshing

17 Voronoi and Delaunay complexes
18 Flipping
19 Delaunay refinement
20 Slivers

This chapter extends what we have learned about Delaunay triangulations from two to three dimensions. Almost everything that will be said generalizes readily to four and higher dimensions. It is therefore tempting to introduce a positive integer d and write the entire chapter for the more general d-dimensional case. In the interest of specificity we will not do this and focus our attention on the three-dimensional case. Section 17 revisits the ideas of Voronoi and Delaunay complexes. Section 18 studies the generalization of the edge flip as a primitive operation in constructing a Delaunay complex in $\mathbb{R}^3$. Section 19 extends the Delaunay refinement algorithm of Ruppert to construct meshes in $\mathbb{R}^3$. Section 20 studies a particularly annoying type of tetrahedron and ways to remove them from Delaunay meshes.