Converting skeletal structures to quad dominant meshes

We propose the Skeleton to Quad-dominant polygonal Mesh algorithm (SQM), which converts skeletal structures to meshes composed entirely of polar and annular regions. Both types of regions have a regular structure where all faces are quads except for a single ring of triangles at the center of each polar region. The algorithm produces high quality meshes which contain irregular vertices only at the poles or where several regions join. It is trivial to produce a stripe parametrization for the output meshes which also lend themselves well to polar subdivision. After an initial description of SQM, we analyze its properties, and present two extensions to the basic algorithm: the first ensures that mirror symmetry is preserved by the algorithm, and the second allows for objects of non-spherical topology.