Acute Triangulations

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Abstract

A *triangulation* of a two-dimensional space means a collection of (full) triangles covering the space, such that the intersection of any two triangles is either empty or consists of a vertex or of an edge. A triangle is called *geodesic* if all its edges are *segments*, i.e., shortest paths between the corresponding vertices. We are interested only in *geodesic triangulations*, all the members of which are, by definition, geodesic triangles. An *acute* (*non-obtuse*) triangulation is a triangulation whose triangles have all their angles less (not larger) than $\frac{\pi}{2}$. In this thesis we investigate acute triangulations of convex quadrilaterals, pentagons and general polygons in the plane. We also discuss acute triangulations of double convex quadrilaterals, double convex pentagons, double symmetric convex sets, flat tori and flat Möbius strips. Furthermore, we investigate acute triangulations of rectangles with angles bounded away from zero.

Keywords: Acute triangulations, non-obtuse triangulations, polygons, surfaces, the smallest angle.

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