Student Research Talks (StReeTs)

Mason Experimental Geometry Lab (MEGL)

Diagonal lengths of n-gons

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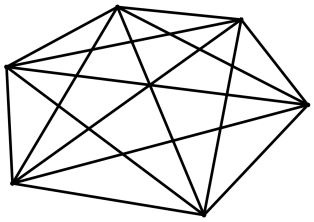

Abstract

By an n-gon we mean a closed loop of n unit length line segments in $\mathbb{R}^3$. An n-gon has $\binom{n}{2} - 2$ diagonals so we can associate to it a point in $\mathbb{R}^{\binom{n}{2}-2}$ where the coordinates are the diagonal lengths. If we fix n and range over all n-gons, what does the collection of points in $\mathbb{R}^{\binom{n}{2}-2}$ look like? For $n = 4$ we get the positive quadrant of a circle of radius 2 centered at the origin in $\mathbb{R}^2$—but for $n = 5$ the points are in $\mathbb{R}^5$; if $n = 6$ the points are in $\mathbb{R}^9$; if $n = 100$ the points are in $\mathbb{R}^{4850}$. What can be said in general? Is it convex? Simply connected? Is its boundary piecewise algebraic? What is special bout the n-gons that map to the boundary? Close to nothing is known and there are a lot of interesting questions.

Date: Friday, January 29, 2016
Time: 2:30pm–3:30pm
Place: Exploratory Hall 4106

Pizza and soda will be served at the presentation.

For further information or for special accommodations, please contact Sean Lawton via email at `seanlawton@gmail.com` or drop by the MEGL.