

Topology, Algebraic Geometry, & Dynamics Seminar

An introduction to generalized splines

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Splines are a fundamental tool in applied mathematics and analysis, classically described as piecewise polynomials on a combinatorial decomposition of a geometric object (a triangulation of a region in the plane, say) that agree up to a specified differentiability on faces of codimension one. Generalized splines extend this idea algebraically and combinatorially: instead of certain classes of geometric objects, we start with an arbitrary combinatorial graph; instead of labeling faces with polynomials, we label vertices with elements of an arbitrary ring; and instead of applying degree and differentiability constraints, we require that the difference between ring elements associated to adjacent vertices is in a fixed ideal labeling the edge. Billera showed that these two characterizations coincide in most cases of real-world interest. In this talk, we describe some of the differences between generalized splines and classical splines, and some of the implications of results about generalized splines for classical splines.

Date: Friday, November 15, 2019

Time: 1:30-2:30 pm

Place: 4106 Exploratory Hall

For special accommodations, please contact David Carchedi via email at dcarched@gmu.edu.