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New work on generalized splines.

Consider a combinatorial graph each of whose edges is labeled with an integer. A spline is a way to label the vertices so that the difference between each pair of adjacent vertices is a multiple of the edge's label.

Splines originally developed in engineering applications, in order to model complex shapes (like boats or cars) more simply while developing designs. One way to do this is choose key points on the object and attach thin strips of wood—called splines—between those points. Mathematical splines are now essential to many applied fields, including computer graphics, numerical algorithms, and PDEs. Billera pioneered algebraic splines, which brought tools from homological and commutative algebra to bear on the study of splines. More recently, work of Gilbert-Polster-Tymoczko and Handschy-Melnick-Reinders generalized splines even further.

In this talk, we describe new work on generalized splines, with applications to representation theory and Schubert calculus. (Received September 16, 2013)