ALGEBRA SEMINAR TALK

WITH

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The University of Western Ontario

FRIDAY, SEPTEMBER 30, 2011

2:30 P.M. – Middlesex College Room 107

"Spline approximation and homology"

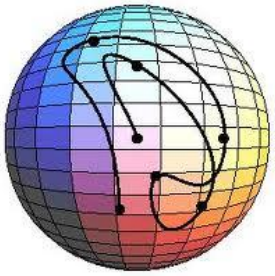
Let Δ be a triangulation of a connected region in the real plane. Let $C(r, d, \Delta)$ be the space of piecewise polynomial functions of degree $\leq d$ and smoothness r. A major question in Approximation Theory is to find the dimension of this space, which is not known even for the case when $d = 3$ and $r = 1$. Alfeld and Schumaker give a formula for this dimension, when $d \geq 3r + 1$ and any Δ. Using homological algebra, this problem can be translated into finding the Hilbert function of a graded module (the "homogenization" of $C(r, d, \Delta)$). I will discuss about this approach and about the Schenck-Stiller conjecture that says that Alfeld-Schumaker formula holds for any $d \geq 2r + 1$. I will present a very recent project with Jan Minac where we prove this conjecture for a triangulation that is not trivial, in the sense that the formula does not hold if $d = 2r$.


P. Alfeld


S. Tohaneanu


L. Schumaker


L. Billera




H. Schenck

What a wonderful mix of numerical analysis, combinatorics, homological algebra and magic delivered with Stefan Tohaneanu's inimitable charm, humour, precision, and depth. It is a gripping, even emotional story of hunting down the dimension of a remarkable vector space of functions. Don't miss this delightful lecture!

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ALL ARE WELCOME! ☺