ACMS Applied Math Seminar

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154 Hurley Hall
4:00 - 5:00 P.M.

Explicit Expression for Multivariate Hermite Interpolation

Multivariate Hermite interpolation problem asks to find a "small" polynomial that has given values of several partial derivatives at given points.
It has numerous applications in science and engineering.
Thus, naturally, it has been intensively studied, resulting in various beautiful ideas and techniques.

One approach is as follows.

(1) Chooses a basis of the vector space of interpolating polynomials.
(2) Translate the interpolating conditions into a system of linear equations.
(3) Solve the system.

A fundamental challenge in this approach is to find a "nice" basisso that the resulting system of linear equations is "easy" to solve.

In this talk, we will give a "nice" basis in that

(1) it is explicit,
(2) the resulting linear system is block diagonal,
(3) each block is triangular, and
(4) the diagonal elements of each block are all one.

We found such a basis by first deriving an explicit Groebner basis of interpolation ideal and by imitating the shape.
This is a joint work with Jeaman Ahn.