



# THE UNIVERSITY OF CHICAGO

Departments of Computer Science, Mathematics, Statistics, and the  
Computation Institute

## SCIENTIFIC AND STATISTICAL COMPUTING SEMINAR

---

### DONGBIN XIU

Department of Mathematics,  
and Scientific Computing and Imaging Institute  
University of Utah

## Multi-dimensional Polynomial Interpolation on Arbitrary Nodes

**THURSDAY, March 7, 2013, at 4:30 PM**

Eckhart 133, 5734 S. University Avenue

### ABSTRACT

Polynomial interpolation is well understood on the real line. And many techniques in multi-dimensional space employs the one-dimensional methods and fill up the space using certain tensor product rule. The typically results in fast growth of the total number of interpolation nodes and certain fixed geometrical structure of the nodal sets. In practice, one often have function data from nodal locations that are not by "mathematical design". These nodes typically possess no desirable structure and their total number can be arbitrary.

In this talk, we present a mathematical framework for conducting polynomial interpolation in multiple dimensions using arbitrary set of unstructured nodes. The resulting method, least orthogonal interpolation, is rigorous and has a straightforward numerical implementation. It can faithfully interpolate any function data on any nodal sets, even on those that are considered degenerate by the traditional methods.

---

#### Organizers:

Lek-Heng Lim, Department of Statistics, [lekheng@galton.uchicago.edu](mailto:lekheng@galton.uchicago.edu),

Ridgway Scott, Departments of Computer Science and Mathematics, [ridg@cs.uchicago.edu](mailto:ridg@cs.uchicago.edu),

Jonathan Weare, Department of Mathematics and the Computation Institute, [weare@math.uchicago.edu](mailto:weare@math.uchicago.edu).

SSC Seminar URL: [http://www.stat.uchicago.edu/seminars/SSC\\_seminars.shtml](http://www.stat.uchicago.edu/seminars/SSC_seminars.shtml)

If you wish to subscribe to our email list, please visit the following website:

<https://lists.uchicago.edu/web/arc/statseminars>.