

Distinguished Lecture Series

Research Lecture

The Euclidean Distance Degree



Professor Bernd Sturmfels
University of California at Berkeley

Chemistry Room 107

Friday, March 27, 2015 at 3:30 p.m.

Refreshments precede the Lecture in Math 238 at 3:00 p.m.

ABSTRACT:

The nearest point map of a real algebraic variety with respect to Euclidean distance is an algebraic function. The Euclidean distance degree is the number of critical points for this optimization problem. We focus on projective varieties seen in engineering applications, and discuss tools for exact computation. Our running example is the Eckart-Young Theorem which relates the nearest point map for low rank matrices with the singular value decomposition. This is joint work with Jan Draisma, Emil Horobet, Giorgio Ottaviani, & Rekha Thomas.

BRIEF BIOGRAPHY:

Bernd Sturmfels received doctoral degrees in Mathematics in 1987 from the University of Washington, Seattle, and the Technical University Darmstadt, Germany. After postdoctoral appointments in Minneapolis and Linz, Austria, he taught at Cornell University, before joining UC Berkeley in 1995, where he is Professor of Mathematics, Statistics and Computer Science. His honors include a National Young Investigator Fellowship, a Sloan Fellowship, and a David and Lucile Packard Fellowship, a Clay Senior Scholarship, an Alexander von Humboldt Senior Research Prize, the SIAM (Society for Industrial and Applied Math) von Neumann Lecturership, and a Sarlo Distinguished Mentoring Award. Recently, he served as Vice President of the American Mathematical Society (AMS). Dr. Sturmfels is a Fellow of the AMS and of SIAM. A leading experimentalist among mathematicians, Sturmfels has authored ten books and over 220 research articles, in the areas of combinatorics, algebraic geometry, symbolic computation and their applications. He has mentored 37 doctoral students and numerous postdocs. His current research focuses on algebraic statistics, optimization, and computational algebraic geometry.

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