Bernd Sturmfels* (bernd@berkeley.edu), Department of Mathematics, University of California, Berkeley, CA 94708. *The Euclidean Distance Degree.

The nearest point map of a real algebraic variety with respect to Euclidean distance is an algebraic function. For instance, for varieties of low rank matrices, the Eckart-Young Theorem states that this map is given by the singular value decomposition. We present work with Jan Draisma, Emil Horobet, Giorgio Ottaviani and Rekha Thomas on nearest point maps from the perspective of computational algebraic geometry. The Euclidean distance degree is the number of critical points of the squared distance to a point outside the variety. Our aim is to compute this number for varieties seen in applications. (Received September 03, 2013)