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Lori Beth Ziegelmeier* (lziegel1@macalester.edu), 1600 Grand Avenue, St. Paul, MN 55105, and **Michael Kirby** and **Chris Peterson**. *A Quadratic Program to Stratify High Dimensional Data Based on Proximity to the Convex Hull.*

The convex hull of a set of points, C , in Euclidean space can help expose extremal properties of C and can help identify elements of C of high interest. We propose a quadratic program for the purpose of stratifying points in a data cloud based on proximity to the convex hull. A quadratic program is solved for each data point to determine an associated weight vector. We show that the weight vector encodes geometric information concerning the point's relationship to the boundary of the convex hull. For instance, we observe that the ℓ_2 -norm of the weight vector is a measure of the distance of the associated point from the boundary. By adjusting parameters in the quadratic program, the weight vector can be made to contain negative components if and only if the point is a vertex. The computation of the weight vectors can be carried out in parallel and the overall computational complexity of the algorithm grows linearly with dimension. As a consequence, meaningful computations can be completed on reasonably large, high dimensional data sets. (Received August 08, 2013)