Publicacions més rellevants de la línia de recerca:

Computació: algorismes geomètrics, àlgebra computacional, estructures de dades

Referència: Bose, P.; Demaine, E. D.; Hurtado, F.; Iacono, J.; Langerman, S.; Morin; P. Geodesic ham-sandwich cuts. *Discrete and Computational Geometry*, **37(3)** (2009), pp. 325–339.

Abstract: Let P be a simple polygon with m vertices, k of which are reflex, and which contains r red points and b blue points in its interior. Let $n = m + r + b$. A *ham-sandwich geodesic* is a shortest path in P between two points on the boundary of P that simultaneously bisects the red points and the blue points. We present an $O(n \log k)$-time algorithm for finding a ham-sandwich geodesic. We also show that this algorithm is optimal in the algebraic computation tree model when parameterizing the running time with respect to n and k.

Referència: Manubens, M.; Montes, A. Minimal canonical comprehensive Gröbner systems. *Journal of Symbolic Computation*, **44(5)** (2009), pp. 463–478.

Abstract: This is the continuation of Montes' paper "On the canonical discussion of polynomial systems with parameters". In this paper, we define the Minimal Canonical Comprehensive Gröbner System of a parametric ideal and fix under which hypothesis it exists and is computable. An algorithm to obtain a canonical description of the segments of the Minimal Canonical CGS is given, thus completing the whole MCCGS algorithm (implemented in Maple and Singular). We show its high utility for applications, such as automatic theorem proving and discovering, and compare it with other existing methods. A way to detect a counterexample to deny its existence is outlined, although the high number of tests done give evidence of the existence of the Minimal Canonical CGS.

Referència: Abellanas, M.; Claverol, M.; Hurtado, F. Point set stratification and Delaunay depth. *Computational Statistics and Data Analysis*, **51(5)** (2009), pp. 2513–2530.

Abstract: In the study of depth functions it is important to decide whether a depth function is required to be sensitive to multimodality. An analysis of the Delaunay depth function shows that it is sensitive to multimodality. This notion of depth can be compared to other depth functions such as the convex and location depths. The stratification that Delaunay depth induces in the point set (layers) and in the whole plane (levels) is investigated. An algorithm for computing the *Delaunay depth contours* associated with a point set in the plane is developed. The worst case and expected complexities of the algorithm are $O(n \log^2 n)$ and $O(n \log n)$, respectively. The depth of a query point p with respect to a data set S in the plane is the depth of p in $S \cup \{p\}$. The Delaunay depth can be computed in $O(n \log n)$ time, which is proved to be optimal, when S and p are given in the input.