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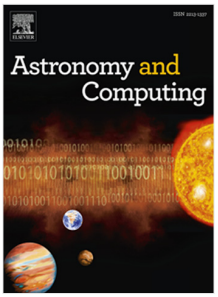

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Delaunay based algorithm for finding polygonal voids in planar point sets

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Abstract

This paper presents a new algorithm to find under-dense regions called voids inside a 2D point set. The algorithm starts from terminal-edges (local longest-edges) in a Delaunay triangulation and builds the largest possible low density terminal-edge regions around them. A terminal-edge region can represent either an entire void or part of a void (subvoid). Using artificial data sets, the case of voids that are detected as several adjacent subvoids is analyzed and four subvoid joining criteria are proposed and evaluated. Since this work is inspired on searches of a more robust, effective and efficient algorithm to find 3D cosmological voids the evaluation of the joining criteria considers this context. However, the design of the algorithm permits its adaption to the requirements of any similar application.

Keywords: Mesh geometry models, join algorithms, data analysis, large-scale structure of universe

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