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Edelsbrunner et al.

(54) METHODS OF GENERATING THREE-DIMENSIONAL DIGITAL MODELS OF **OBJECTS BY WRAPPING POINT CLOUD** DATA POINTS

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- U.S. Cl. 700/98; 703/2; 345/419 (52)
- (58) Field of Search 700/98, 97, 117, 700/118, 119, 120, 182; 345/419, 420; 703/2

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622-INPUT: SIMPLEX $\boldsymbol{\tau}$ 624 FOR EVERY PROPER COFACE υ OF τ DO 626 628 THERE IS FLOW FROM υ TO τ OUTPUT: EQUIVOCAL 630 -FOR EVERY PROPER FACE σ of τ do 632 634 NO THERE IS FLOW YES FROM τ TO σ OUTPUT: CONFIDENT 636 OUTPUT: CENTERED

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ABSTRACT (57)

A method of automatic conversion of a physical object into a three-dimensional digital model. The method acquires a set of measured data points on the surface of a physical model. From the measured data points, the method reconstructs a digital model of the physical object using a Delaunay complex of the points, a flow streuture of the simplicies in the Delaunay complex and retracting the Delaunay complex into a digital model of the physical object using the flow structure. The method then outputs the digital model of the physical object.

30 Claims, 19 Drawing Sheets

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