

University of Notre Dame Department of Mathematics

FELIX KLEIN SEMINAR

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University of Notre Dame

Will give a lecture entitled:

Planar Pixelations and Shape Recognition

On

Thursday, March 10, 2011

At

2:00 PM

In

125 Hayes-Healy Hall

Abstract

Any subset of the plane can be approximated by a set of square pixels. This transition from a shape to its pixelation is rather brutal since it destroys geometric and topological information about the shape. Using a technique inspired by Morse Theory, we algorithmically produce a PL approximation of the original shape using only information from its pixelation. This approximation converges to the original shape in a very strong sense: as the size of the pixels goes to zero we can recover important geometric and topological invariants of the original shape such as Betti numbers, area, perimeter and curvature measures.