CAD 2021

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Submission

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Submission ID: 62

Title: MidcurveNN: Neural Network for Computing Midcurve of a Thin Polygon

Submission Type: Extended Abstract - consider for Journal Invitation

Author 1:
First Name: Yogesh
Last Name: Kulkarni
Organization:
Country: India
Email: yogeshkulkarni@yahoo.com

Contact Author: Author 1

Alternate Contact: kulkarniay@gmail.com

Topic(s): Artificial intelligence in design

Keywords: Midcurve, Medial-axis Transform, Encoder-Decoder, Neural Networks

Abstract: Various applications need lower dimensional representation of shapes. Midcurve is one-dimensional(1D) representation of a two-dimensional(2D) planar shape. It is used in applications such as animation, shape matching, retrieval, finite element analysis, etc. Methods available to compute midcurves vary based on the type of the input shape (images, sketches, etc.) and processing (thinning, Medial Axis Transform (MAT), Chordal Axis Transform (CAT), Straight Skeletons, etc.).

This paper talks about a novel method called MidcurveNN which uses Encoder-Decoder neural network for computing midcurve from images of 2D thin polygons in supervised learning manner. This dimension reduction transformation from input 2D thin polygon image to output 1D midcurve image is learnt by the neural network, which can then be used to compute midcurve of an unseen 2D thin polygonal shape

Comments: