


**Title:** MidcurveNN: Encoder-Decoder Neural Network for Computing Midcurve of a Thin Polygon

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**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 presentation 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.

**Keywords:** Midcurve, Encoder-Decoder, Neural Network.

**Outline/Structure of the talk:**

- Introduction
- Proposed Method
- Data acquisition, preparation
- Implementation
- Results
- Conclusion and future work

**Learning Outcomes:**

- How to treat geometric shapes as input data?
- Applicability of Deep Learning to model geometric Transformation.

**Target Audience/Pre-requisites:**

- Anyone familiar with basics of Deep Learning
- Students/ Professionals with college level Geometry

**Slides:** To be made. Pre-print paper with same content at <http://vixra.org/abs/1904.0429>

**Video:** <https://www.youtube.com/watch?v=TcPYEa410PI> (need to boost up audio)

**Links:**

- Google Scholar: <https://scholar.google.co.in/citations?user=RuELzwYAAAAJ&hl=en>
  - Details about workshops done at <http://www.yati.io>
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