

## Abstract

This thesis proposes a novel approach for three dimensional, active contours, so-called snakes. The two dimensional energy-approach of Kass et al. serves as a foundation. The extension to the third dimension is realized with a tube energy which connects every single snake across different layers. The initialization of the three dimensional snake is provided by two dimensional snakes in the beginning and the ending layers of the wanted area. The snakes of the initial guess in between those two layers are interpolated by linear connections. This is called a three dimensional snake. Throughout this thesis a continuous definition of the three dimensional snake is given. The new approach is compared experimentally to the vesselness-filtering of Frangi et al. in three dimensions. The experiments aim to compare the segmentation success as well as an optimal choice of parameters. As a gold standard serves a method which achieved a high ranking in the *VESSEL12* challenge of MICCAI'12.

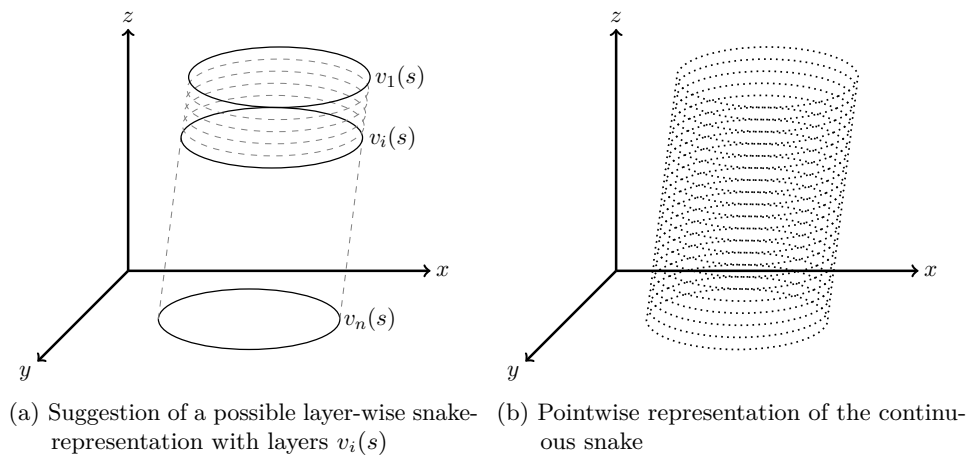


Figure 1: Layer-wise and continuous snakes