

## Publication

### Automatic segmentation of the spinal cord using continuous max flow with cross-sectional similarity prior and tubularity features

#### ConferencePaper (Artikel, die in Tagungsbänden erschienen sind)

**ID** 2846341

**Author(s)** Pezold, Simon; Fundana, Ketut; Amann, Michael; Andelova, Michaela; Pfister, Armanda; Sprenger, Till; Philippe. C. Cattin,

**Author(s) at UniBasel** [Cattin, Philippe Claude](#) ;

**Year** 2015

**Title** Automatic segmentation of the spinal cord using continuous max flow with cross-sectional similarity prior and tubularity features

**Book title (Conference Proceedings)** Recent advances in computational methods and clinical applications for spine imaging

**Place of Conference** Boston, USA

**Publisher** Springer

**Place of Publication** Cham

**Pages** S. 107-118

Segmenting tubular structures from medical image data is a common problem; be it vessels, airways, or nervous tissue like the spinal cord. Many application-specific segmentation techniques have been proposed in the literature, but only few of them are fully automatic and even fewer approaches maintain a convex formulation. In this paper, we show how to integrate a cross-sectional similarity prior into the convex continuous max-flow framework that helps to guide segmentations in image regions suffering from noise or artefacts. Furthermore, we propose a scheme to explicitly include tubularity features in the segmentation process for increased robustness and measurement repeatability. We demonstrate the performance of our approach by automatically segmenting the cervical spinal cord in magnetic resonance images, by reconstructing its surface, and acquiring volume measurements.

**edoc-URL** <http://edoc.unibas.ch/dok/A6348361>

**Full Text on edoc** No;

**Digital Object Identifier DOI** 10.1007/978-3-319-14148-0\_10

**Additional Information** Note: Full paper presented at the MICCAI 2014 workshop on Computational Methods and Clinical Applications for Spine Imaging