

Automated segmentation of midbrain structures
with high iron content

Benjamín Garzón, Rouslan Sitnikov, Lars
Bäckman, Grégoria Kalpouzos



PII: S1053-8119(17)30486-X
DOI: <http://dx.doi.org/10.1016/j.neuroimage.2017.06.016>
Reference: YNIMG14098

To appear in: *NeuroImage*

Received date: 24 March 2017
Revised date: 1 June 2017
Accepted date: 7 June 2017

Cite this article as: Benjamín Garzón, Rouslan Sitnikov, Lars Bäckman and Grégoria Kalpouzos, Automated segmentation of midbrain structures with high iron content, *NeuroImage*, <http://dx.doi.org/10.1016/j.neuroimage.2017.06.016>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Automated segmentation of midbrain structures with high iron content**Benjamín Garzón^{a*}, Rouslan Sitnikov^b, Lars Bäckman^a, Grégoria Kalpouzos^a**^aAging Research Center (ARC), Karolinska Institute and Stockholm University, Sweden^bMRI Research Center, Karolinska University Hospital, Sweden

benjamin.garzon@ki.se

rouslan.sitnikov@ki.se

lars.backman.1@ki.se

gregoria.kalpouzos@ki.se

***Corresponding author:** Aging Research Center Karolinska Institute Gävlegatan 16 113 30 Stockholm, Sweden. Tel.: +46 729 442 902

Abstract

The substantia nigra (SN), the subthalamic nucleus (STN), and the red nucleus (RN) are midbrain structures of ample interest in many neuroimaging studies, which may benefit from the availability of automated segmentation methods. The high iron content of these structures awards them high contrast in quantitative susceptibility mapping (QSM) images. We present a novel segmentation method that leverages the information of these images to produce automated segmentations of the SN, STN, and RN. The algorithm builds a map of spatial priors for the structures by non-linearly registering a set of manually-traced training labels to the midbrain. The priors are used to inform a Gaussian mixture model of the image intensities, with smoothness constraints imposed

Download English Version:

<https://daneshyari.com/en/article/8687134>

Download Persian Version:

<https://daneshyari.com/article/8687134>

[Daneshyari.com](https://daneshyari.com)