



# DTI Processing - Software Tools

DO TROMP

READ REVIEWS

WRITE A REVIEW

**CORRESPONDENCE:**  
do.tromp@gmail.com

**DATE RECEIVED:**  
April 08, 2016

**DOI:**  
10.15200/winn.146057.73165

**ARCHIVED:**  
April 13, 2016

**KEYWORDS:**  
Diffusion Tensor Imaging,  
software

**CITATION:**  
Do Tromp, DTI Processing -  
Software Tools, *The Winnower*  
3:e146057.73165, 2016, DOI:  
10.15200/winn.146057.73165

© Tromp This article is  
distributed under the terms of  
the [Creative Commons  
Attribution 4.0 International  
License](#), which permits  
unrestricted use, distribution,  
and redistribution in any  
medium, provided that the  
original author and source are  
credited.



When starting out in a new imaging field like diffusion tensor imaging it is easy to be overwhelmed by different processing steps and tools.

A recent publication from [Frontiers in Neuroscience](#) tries to offer an answer to most of these questions in their appropriately named article: "A hitchhiker's guide to diffusion tensor imaging". You can find the full manuscript [here](#).

frontiers in  
**NEUROSCIENCE**

**REVIEW ARTICLE**  
published: 12 March 2013  
doi: 10.3389/fnins.2013.00031



## A hitchhiker's guide to diffusion tensor imaging

**José M. Soares<sup>1,2\*</sup>, Paulo Marques<sup>1,2,3</sup>, Victor Alves<sup>3</sup> and Nuno Sousa<sup>1,2</sup>**

<sup>1</sup> Life and Health Science Research Institute (ICVS), School of Health Sciences, University of Minho, Braga, Portugal

<sup>2</sup> ICVS/3B's - PT Government Associate Laboratory, Braga/Guimarães, Portugal

<sup>3</sup> Department of Informatics, University of Minho, Braga, Portugal

The article discusses sources of artifacts during acquisition and how to reduce/correct them, they go into some detail on how to do quality control (see more on this [here](#)), what skull stripping methods are available, how you can use RESTORE for robust tensor estimation, etc.

Most importantly, they supply an exhaustive list of DTI software packages that I adapted into the below table.

DTI tools	Pre- processing	Tensor estimation	Fiber tracking	ROI- analysis	Registration
3D Slicer		X	X	X	
AFNI	X	X			
BioImage Suite		X	X	X	
BrainVoyager QX		X	X		
Camino		X	X		
Dipy		X	X		

DoDTI	x	x	x		
DTI-Query			x		
DTI-TK					x
DTIStudio		x	x	x	
ExploreDTI	x	x	x		
Freesurfer	x	x			
FSL-FDT	x	x	x		
FSL-TBSS					x
JIST	x	x			
MedINRIA		x	x	x	
MrDiffusion		x	x		
MRtrix		x	x		
SATURN		x	x		
SPM	x	x			
TrackVis		x	x	x	
TORTOISE	x	x		x	
	<b>Pre- processing</b>	<b>Tensor estimation</b>	<b>Fiber tracking</b>	<b>ROI- analysis</b>	<b>Registration</b>

*Reference: J.M. Soares, P. Marques, V. Alves, N. Sousa (2013). A hitchhiker's guide to diffusion tensor imaging, Frontiers in Neuroscience.*

For my own research I use a combination of packages: FSL for preprocessing, Camino for tensor fitting and fiber tracking, DTI-TK for tensor based normalization and TrackVis for visualization and ROI-analysis.