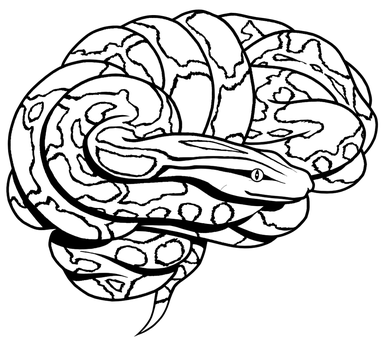
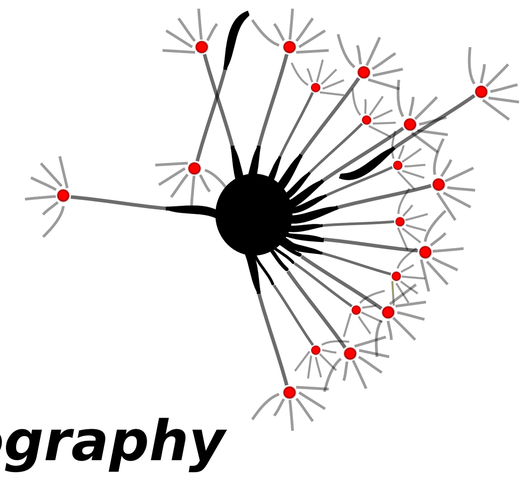


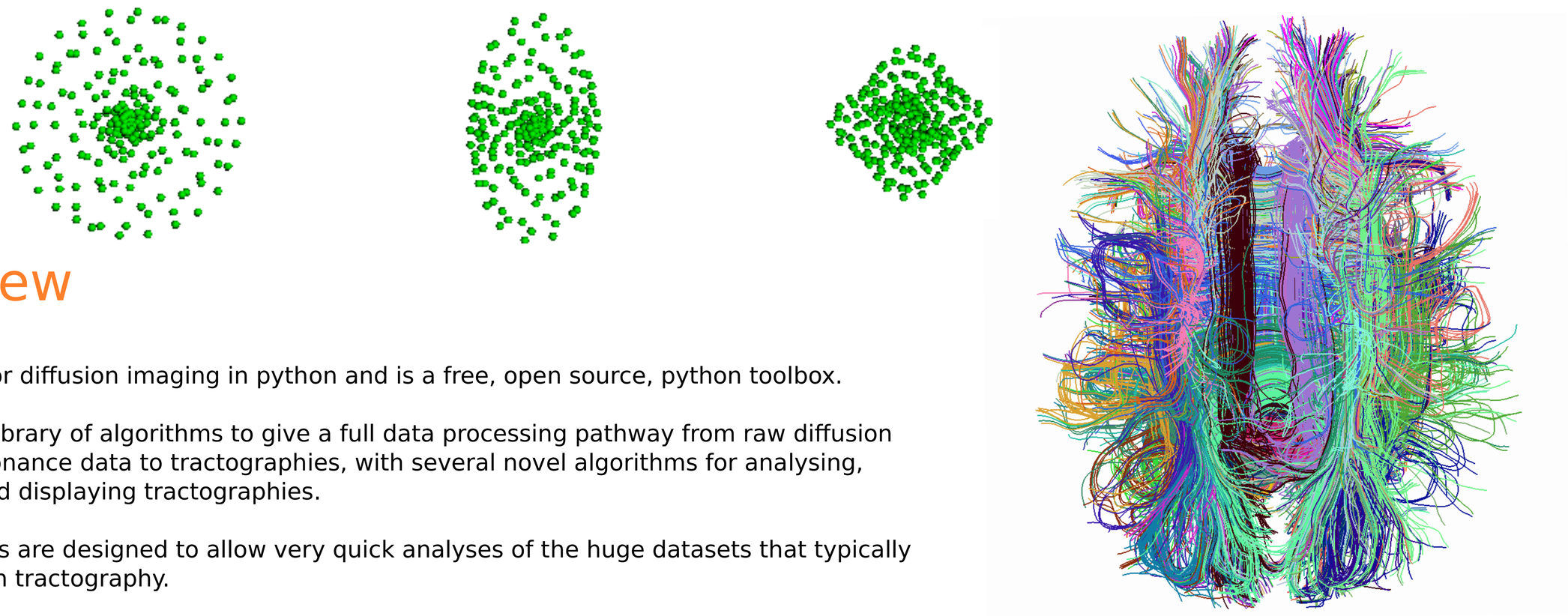
Diffusion Imaging in Python

DIPY



A novel software library for diffusion MR and tractography

Eleftherios Garyfallidis, Matthew Brett, Bagrat Amirbekian, Christopher Nguyen, Fang-Cheng Yeh, Emanuele Olivetti, Yaroslav Halchenko and Ian Nimmo-Smith



Overview

Dipy stands for diffusion imaging in python and is a free, open source, python toolbox.

It provides a library of algorithms to give a full data processing pathway from raw diffusion magnetic resonance data to tractographies, with several novel algorithms for analysing, comparing and displaying tractographies.

Our algorithms are designed to allow very quick analyses of the huge datasets that typically are involved in tractography.

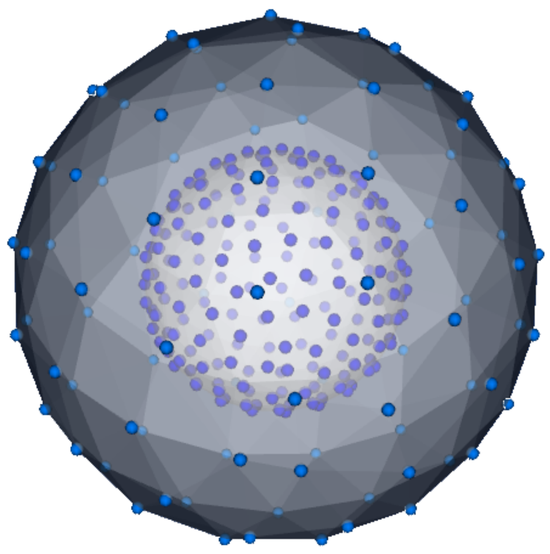
Dipy operates across all standard platforms and inter-operates with the file formats of a wide range of other brain imaging software.

Version 0.5.0 Just Released !!!

www.dipy.org

Example

```
>>> import numpy as np
>>> from dipy.reconst.dti import Tensor
>>> from dipy.data import get_data
>>> fimg,fbval,fbvec=get_data('small_101D')
>>> import nibabel as nib
>>> img=nib.load(fimg)
>>> data=img.get_data()
>>> bvals=np.loadtxt(fbvals)
>>> gradients=np.loadtxt(fbvecs).T
>>> ten=Tensor(data,bvals,gradients,thresh=50)
>>> FA=ten.fa()
>>> MASK = FA < 0.2
```

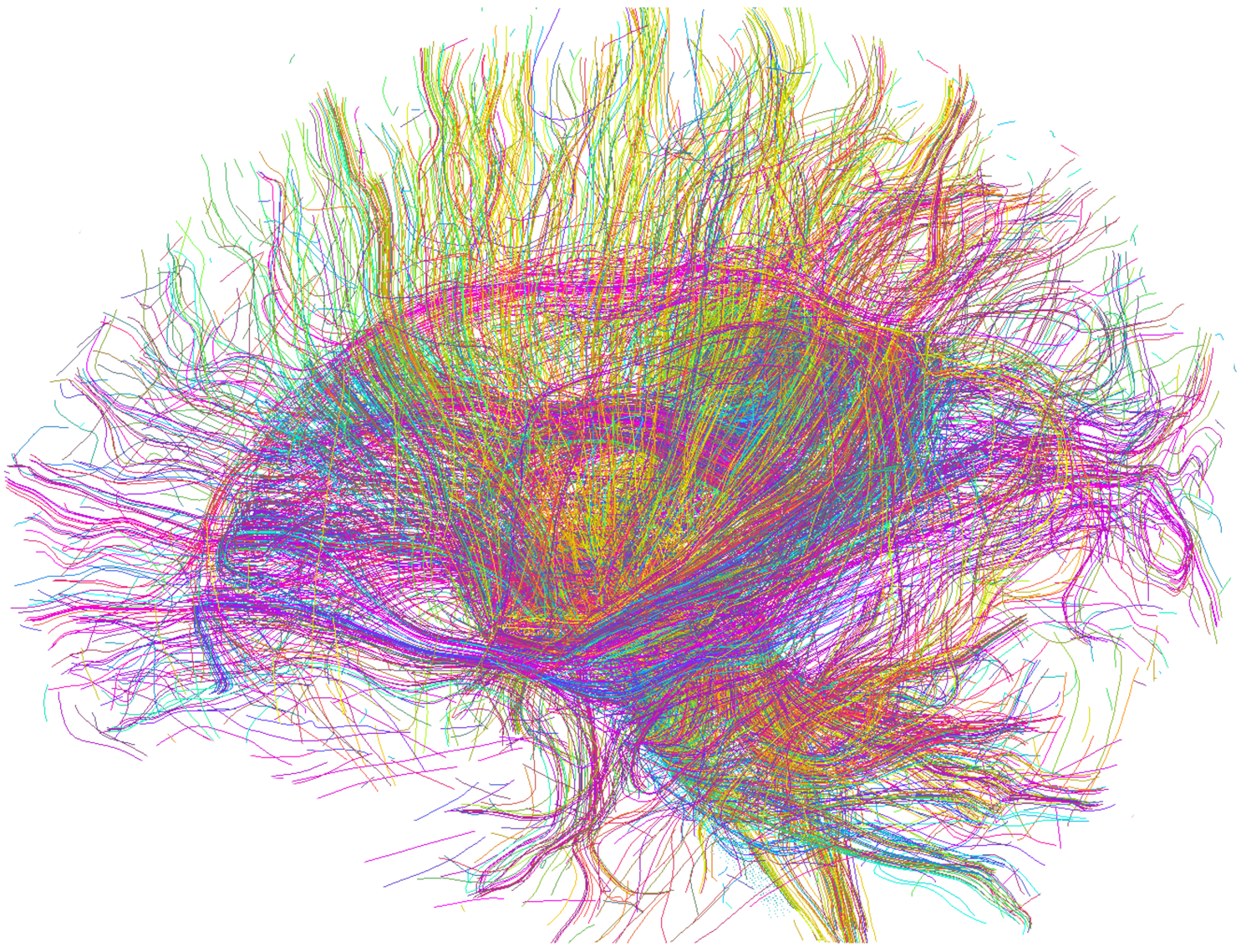


Purpose

The aim of dipy is to make it easier to do better diffusion MR imaging research.

This it achieves by clearly written, and clearly explained, code with a good fit to the underlying concepts, designed in a way that fosters large scale collaborative development using the latest software engineering principles.

We believe that by understanding the underlying anatomy in vivo and by providing the tools to compare different populations we will be able to help researchers and medical practitioners with new ways to investigate and understand the structure of the complex neuronal pathways in the brain in health or disease.



Available options

- Reconstruction algorithms, e.g. GQI, DTI
- Tractography generation algorithms, e.g. EuDX
- Intelligent downsampling of tracks
- Ultra fast tractography clustering
- Resampling datasets
- Visualizing multiple brains simultaneously
- Inter-brain track correspondence
- Warping tractographies
- Reading many different file formats
- Dealing with huge tractographies
- Playing with datasets interactively

Get Involved!

MRC Cognition and Brain Sciences Unit

Cython python

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