

medical image visualization library for neuroscience in python

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Software

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Summary

Neuroscience research routinely demands a variety of visualization tasks, ranging from a simple 2D image to custom-built composite stacks. While different laboratories attend to this need differently, among which the majority of users tend to use what's already available even if its not ideal. While few laboratories, when resources and skills permit, engage in in-house software development to temporarily solve it, they are not often either open source at all, or made with the intent to be distributed widely and to be reliable. We aim to address this need with fully-open-source and pure-python implementation.

mrivis provides easy ways to perform non-trivial medical image visualization tasks, such as visual comparison of spatial alignment of neuroimaging data. In addition, we provide a base development kit containing carefully-designed python classes to traverse through 3D neuroimaging data ([SlicePicker](#)), produce customizable collages ([Collage](#)) and to flatten 4D or higher-dimensional MRI data into 2D images ([Carpet](#)). These classes together form a easy to use development kit to build even more customized visualizations, which is often needed for cutting-edge neuroscience research.

It is based on matplotlib (Hunter 2007), nibabel (Brett et al. 2016) and numpy (Oliphant 2007), and is already serving visualqc (Raamana 2018).

Brett, Matthew, Michael Hanke, Ben Cipollini, Marc-Alexandre Côté, Chris Markiewicz, Stephan Gerhard, Eric Larson, et al. 2016. "Nibabel: Access a Cacophony of Neuro-Imaging File Formats, Version 2.1. 0." *Zenodo*.

Hunter, John D. 2007. "Matplotlib: A 2D Graphics Environment." *Computing in Science & Engineering* 9 (3). IEEE:90–95.

Oliphant, Travis E. 2007. "Python for Scientific Computing." *Computing in Science & Engineering* 9 (3). IEEE.

Raamana, Pradeep Reddy. 2018. "VisualQC: Assistive tools for easy and rigorous quality control of neuroimaging data." <https://doi.org/10.5281/zenodo.1211365>.