brainhack
Report from 2015 OHBM Hackathon (HI)

Nipype interfaces in CBRAIN

Project URL: http://cbrain.mcgill.ca

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1 Introduction

We aim at the large-scale, automatic sharing of software tools between neuroimaging processing platforms, which will increase the relevance of such platforms by providing them with richer repositories of higher-quality tools. Currently, efforts are hampered by the repetitive porting of the same few tools in different platforms. During the HBM 2015 Hackathon, we worked on the export of software tools from the Nipype workflow engine [1] to the CBRAIN web platform for distributed computing [2]. Nipype includes a large number of tools that would be useful to CBRAIN users.

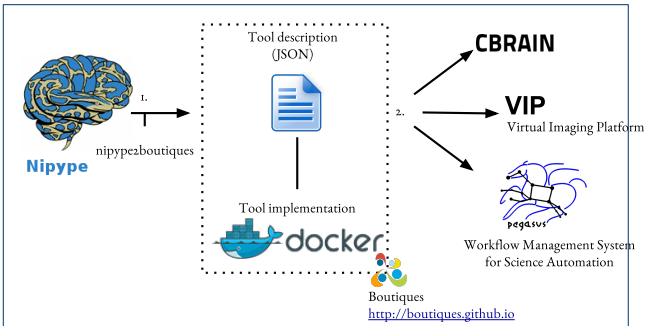

Figure 1 System architecture.

2 Approach

We developed a tool to export Nipype interfaces to the "Boutiques" tool description format (step 1. on Figure 1.). Boutiques descriptions are importable by CBRAIN and other platforms (Virtual Imaging Platform [3] and the Pegasus workflow engine [4]). They point to a Docker image containing the implementation of the tool. nipype2boutiques relies on nipype_cmd, a tool to run Nipype Interfaces as Linux command lines. nipype2boutiques parses the inputs and outputs of a Nipype interface and extracts their name, type, description and position on the nipype_cmd command line. nipype2boutiques then generates a Boutiques descriptor pointing to a Docker image where the Nipype interface is available. Once a Nipype interface is exported using nipye2boutiques, it can be imported to CBRAIN.

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3 Results

We tested nipype2boutiques on a few Nipype interfaces from the FSL Nipype module. We exported 64 FSL tools automatically from Nipype to CBRAIN, and made them available at https://github.com/glatard/boutiques-nipype-fsl. Limitations remain on the type of Nipype interface that can be exported by nipype2boutiques: in particular, InputMultiPath are currently not supported, and output files have to be written in the execution directory of the Nipype Interface.

4 Conclusions

We prototyped a software tool to export Nipype Interfaces as Boutiques descriptors which can be imported by CBRAIN and other platforms. Although the solution is still limited to simple interfaces, we believe that it has the potential to enable fully-automatic tool sharing between Nipype and CBRAIN. Future extensions of the nipype2boutiques tool will be published in the Nipype Github repository at https://github.com/nipy/nipype. We also plan on a tighter integra-

tion of Nipype workflows in CBRAIN, following the model adopted in˜[5].

Availability of Supporting Data
More information about this project can be found at: http://cbrain.mcgill.ca. Further data and files supporting this project are hosted in the *GigaScience* repository REFXXX.

Competing interests
None

Author's contributions
TG wrote the software and the report; SD contributed to the concept elaboration at the OHBM event, RA, NB, PR and MER provided support on the CBRAIN framework, RB implemented Boutiques in CBRAIN, NKM provided background information on fMRI packages, ACE spearheaded the project.

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