

# Lessons learnt with ReproVIP

Thursday, 3 October 2024 09:00 (20 minutes)

The ReproVIP project aimed at evaluating and improving the reproducibility of scientific results obtained with the Virtual Imaging Platform (VIP) in the field of medical imaging. ReproVIP focused on a reproducibility level ensuring that the code produces the same result when executed with the same set of inputs and that an investigator is able to reobtain the published results. We investigated reproducibility at three levels: (i) the code itself, and in particular different versions of the same code [Lig2023], (ii) the execution environment, such as the operating system and code dependencies [Vila2024], parallel executions and the use of distributed infrastructures and (iii) the exploration process, from the beginning of the study and until the final published results [Vila2023].

Within this project, we conducted different studies corresponding to these three reproducibility levels. Some of them were conducted on the EGI infrastructure, in production conditions, others on the Grid<sup>5000</sup> research infrastructure. Grid<sup>5000</sup> is a large-scale testbed deployed in France (and member of the SLICES RI) for experiment-driven research in all areas of computer science. It provides access to a large amount of resources highly reconfigurable and controllable, which allowed us to adopt solutions available on EGI, such as CVMFS.

Within ReproVIP, we also enriched the ecosystem around VIP with tools facilitating the assessment of the reproducibility of scientific results: a reproducibility dashboard, a data management platform and a continuous integration tool. The tools are interconnected and linked to VIP, providing researchers with an integrated end-to-end solution to improve the reproducibility of scientific results.

The talk will present the studies and tools produced within ReproVIP, highlighting the findings and lessons learnt during the project.

## References:

[Lig2023] Morgane Des Ligneris, Axel Bonnet, Yohan Chatelain, et al., “Reproducibility of Tumor Segmentation Outcomes with a Deep Learning Model,” in International Symposium on Biomedical Imaging (ISBI), Cartagena de Indias, Colombia, Apr. 2023

[Vila2023] Gaël Vila, Axel Bonnet, Fabian Chauveau, et al., “Computational Reproducibility in Metabolite Quantification Applied to Short Echo Time in vivo MR Spectroscopy” in International Symposium on Biomedical Imaging (ISBI), Cartagena de Indias, Colombia, Apr. 2023

[Vila2024] Gaël Vila, Emmanuel Medernach, Inés Gonzalez, et al., “The Impact of Hardware Variability on Applications Packaged with Docker and Guix: a Case Study in Neuroimaging,” Submitted at <https://acm-rep.github.io/2024/>, Feb. 2024.

## Topic

EOSC Developments and Open Science: Reproducible Open Science

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