

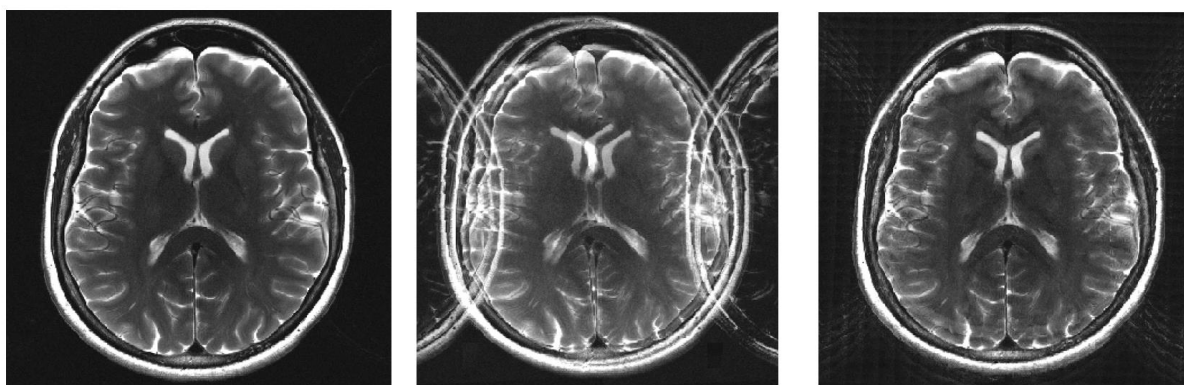
Master project

Location: HUG, CIBM MRI HUG-UNIGE,
Boulevard de la Tour 8, Genève

Dates/Duration: Spring/Fall 2025

Evaluating Motion-Corrupted MRI with MRIQC

Magnetic Resonance Imaging (MRI) is a non-invasive imaging technique known for exceptional soft tissue contrasts. However, its lengthy scans increase the likelihood of motion artifacts, degrading image quality and risking misdiagnoses. Manual inspection of the vast number of brain MRI scans in clinical and research settings is impractical, highlighting the need for automated quality control tools. This project seeks a motivated Master's student to explore advanced image quality assessment using MRIQC, an open-source tool integrating many different image quality metrics (IQMs). The student will familiarize themselves with these IQMs and work hands-on with MRIQC. The goal is to apply it to motion-corrupted MRI datasets (both in vivo and simulated) to evaluate its ability to detect motion and quantify image degradation. This project offers an opportunity to contribute to cutting-edge MRI research, with the potential for inclusion in a scientific publication.



References

- [1] Dabrowski O, Falcone J-L, Klauser A, Songeon J, Kocher M, Chopard B, Lazeyras F, Courvoisier S. [SISMIK for brain MRI: Deep-learning-based motion estimation and model-based motion correction in k-space](#) – IEEE Trans Med Imaging, 2024.
- [2] Dabrowski O, Courvoisier S, Falcone J-L, Klauser A, Songeon J, Kocher M, Chopard B, Lazeyras F. [Choreography Controlled \(ChoCo\) brain MRI artifact generation for labeled motion-corrupted datasets](#) – Phys Med, 2022, Oct:102:79-87.
- [3] Provins C, MacNicol E, Seeley SH, Hagmann P, Esteban O. [Quality control in functional MRI studies with MRIQC and fMRIPrep](#) – Front. Neuroimaging, 2023, Jan 12:1:1073734.

Supervisor

- **Main Supervisor:** Oscar Dabrowski, CIBM MRI HUG-UNIGE, [Oscar Dabrowski - CIBM | Center for Biomedical Imaging](#), oscar.dabrowski@unige.ch
- **Co-Supervisor:** Sébastien Courvoisier, CIBM MRI HUG-UNIGE, [Sébastien Courvoisier - CIBM | Center for Biomedical Imaging](#), sebastien.courvoisier@unige.ch

Skills

Qualifications, previous experience and background:

- Interest in MRI and image processing.
- Basic programming experience, ideally with Python/MATLAB (notions of Bash is a plus).
- Ability to work independently and proactively seek and apply relevant information.

How to apply: Please send your CV and motivation letter to the main supervisor: oscar.dabrowski@unige.ch

About CIBM

The CIBM Center for Biomedical Imaging was founded in 2004 and is the result of a major research and teaching initiative of the partners in the Science-Vie-Société (SVS) project between the Ecole Polytechnique Fédérale de Lausanne (EPFL), the Université de Lausanne (UNIL), Université de Genève (UNIGE), the Hôpitaux Universitaires de Genève (HUG) and the Centre Hospitalier Universitaire Vaudois (CHUV), with the generous support from the Fondation Leenaards and Fondation Louis-Jeantet.

CIBM brings together highly qualified, diverse, complementary and multidisciplinary groups of people with common interest in biomedical imaging.

We welcome you in joining the CIBM Community.

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