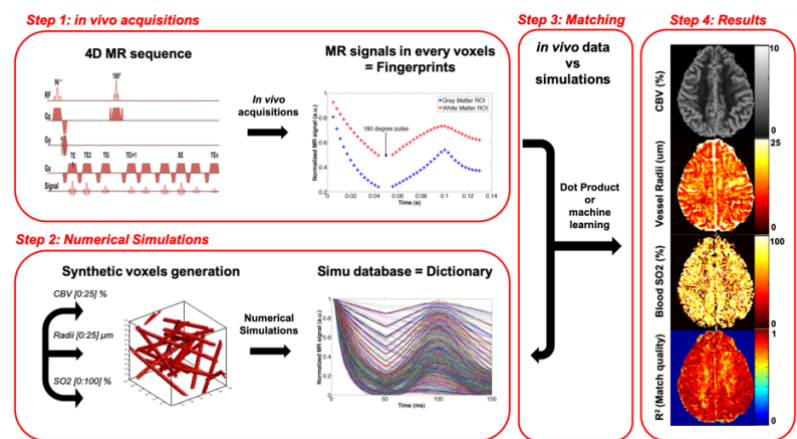




Postdoc/Research Engineer Position focusing on Magnetic Resonance Fingerprinting and Artificial Intelligence for stroke emergencies.

The position is offered at the Grenoble Institute of Neuroscience (GIN <https://neurosciences.univ-grenoble-alpes.fr/en/>) in the team "Functional Neuroimaging and Brain Perfusion" under the supervision of Dr Thomas CHRISTEN and Dr. Emmanuel BARBIER. Our multidisciplinary group works on the development of innovative techniques for acquisition and analysis for Magnetic Resonance Imaging and Spectroscopy (MRI and MRS) and on their preclinical and clinical evaluation in neurosciences. Since 2020, we are also part of the Multidisciplinary Institute in Artificial Intelligence (<https://miai.univ-grenoble-alpes.fr/>) that aims to conduct research in artificial intelligence at the highest level, to offer attractive courses for students and professionals of all levels, to support innovation in large companies, SMEs and startups and to inform and interact with citizens on all aspects of AI.

Project Description: The general aim of the 'MR FUSE' project, funded by the French National Research Agency (ANR), is the development of new Magnetic Resonance imaging tools for the management of acute stroke patients. We propose to use the concept of MR 'fingerprinting' (ref1) combined with artificial intelligence algorithms to create a fast (<5min), efficient (anatomy+relaxometry+diffusion+perfusion) and robust (motion insensitive) MRF sequence that doesn't require the use of contrast agent. This imaging solution will



allow a better triage of acute stroke patients to appropriate treatments. MR FUSE will also give access to new biomarkers (microvascular network integrity, hypoxia, etc...) (ref2, Fig1) that will be used to improve the evaluation of the ischemic penumbra and lead to better individualization of treatments outside of the current therapeutic window. MR FUSE will be optimized with numerical simulations and deep learning tools, validated in a preclinical study and tested in healthy volunteers to prepare for a future clinical trial.

The proposed work combines physics and applied mathematics (mostly AI). It consists in developing new MRF tools for preclinical and clinical platforms. MRI simulations and AI codes will be written in Python (+keras, +PyTorch) and Matlab. Data will be collected on Bruker (4.7T and 9.4T) and Philips (3T) scanners with the help of engineers from the IRMaGe platform (<https://irmage.univ-grenoble-alpes.fr/>). Part of the work will be conducted in collaboration with Philips Research and Olea Medical (<https://www.olea-medical.com/en/>).

Formation: PhD in Physics / Info / Applied Math. Experience in medical imaging and/or AI is preferred.

Contact: Interested applicants should forward a curriculum vitae with a brief statement of research interests & career goals to: Thomas Christen (thomas.christen@univ-grenoble-alpes.fr).

Location: Grenoble Institute of Neurosciences (GIN): <https://neurosciences.univ-grenoble-alpes.fr/en/>

Start: Winter 2022. Expected project duration: 24 months.

References: [ref1] Ma et al., *Nature*, 2013. [ref2] Christen et al., *Neuroimage*, 2014.