



A Software Tool for Quantitative Analysis of DCE-MRI Data

Anirban Sengupta¹, Dinil Sasi¹, Rakshit Choudhary¹, Prashant Budania¹, Anmol Nijhawan¹, Sameer Manickam¹, Rakesh kumar Gupta², Anup Singh^{1,3}
¹ Centre For Biomedical Engineering, IIT Delhi; ² Department of Radiology, FORTIS, Gurgaon, India; ³ Department of Biomedical Engineering, AIIMS

INTRODUCTION

Quantitative analysis of DCE-MRI data plays an important role in diagnosis and treatment of various diseases. Various mathematical models providing haemodynamic, tracer-kinetic, first-pass analysis parameters have been reported for quantitative analysis of DCE-MRI data. Due to the lack of standardization of MRI protocols and continuously evolving technology, existing software tools need to be updated and modified.

In this study, we present an in-house developed software, in Matlab platform, for quantitative Analysis of DCE-MRI Data. This tool can be run from command line as well as have a user friendly GUI, which enables input of various parameters and display option for raw and processed images. This software can compute T1 map, B1 field map, different DCE haemodynamic, tracer-kinetic and piecewise linear model parameters. The software is compatible with data obtained from Philips, Siemens and GE MR Scanners and results have been verified by radiologists.

The total runtime of the software for 12 brain slices of image size=256*256 is approximately 45 minutes in a 64GB RAM system and 75 minutes in a 16GB RAM system. Users can edit the code as per requirement.

KEY FEATURES

- Flexibility to use different methods for T1 estimation.
- Options for different types of AIF.
- Perform Piecewise linear model fitting for automatic BAT estimation.
- Perform first pass analysis.
- Perform analysis of various Tracer Kinetic models like GTKM and LTKM.
- Parallel processing technique of Matlab in a multi-core system reduces processing time substantially.
- Linked with SPM for automatic registration and segmentation of brain.

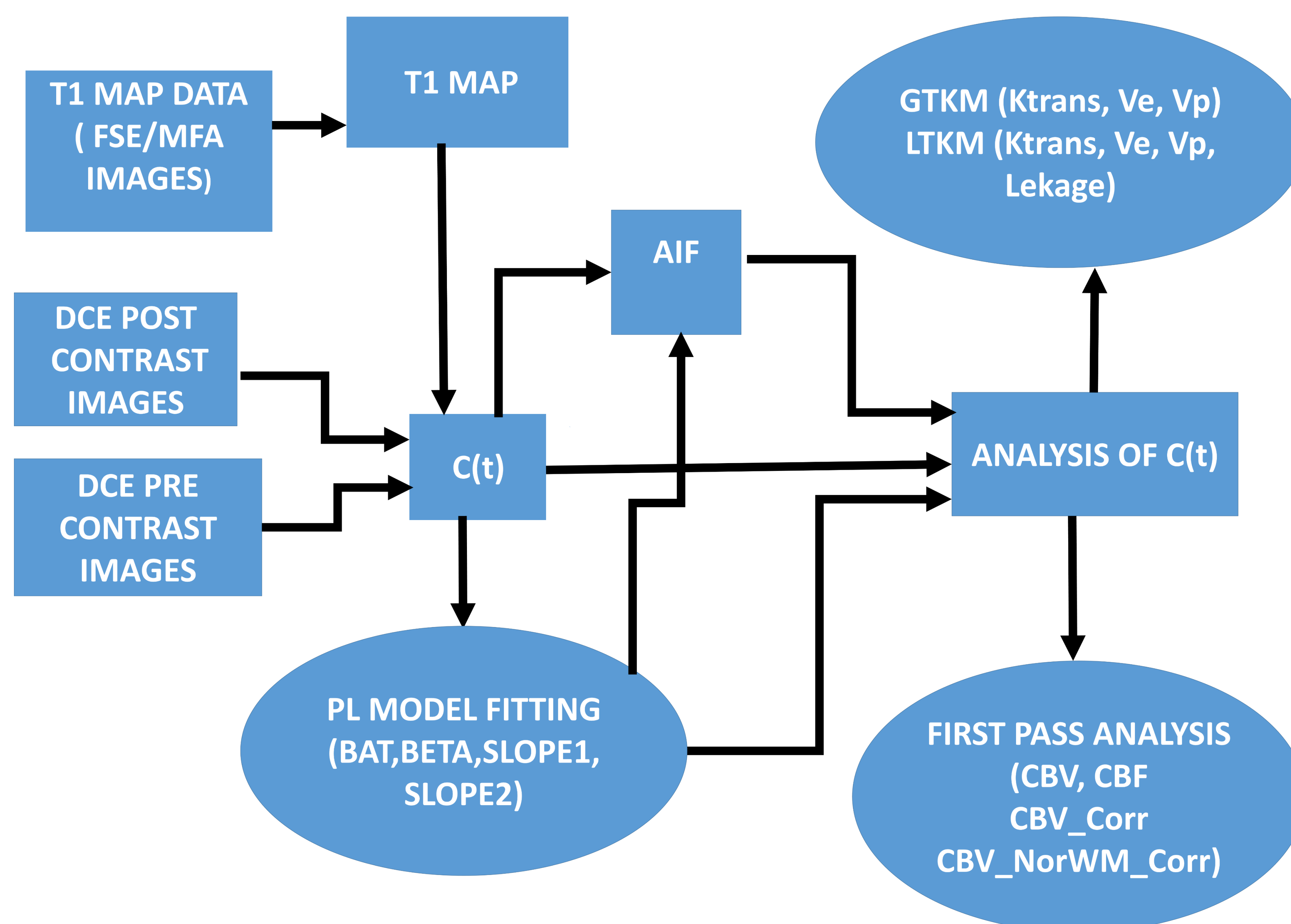
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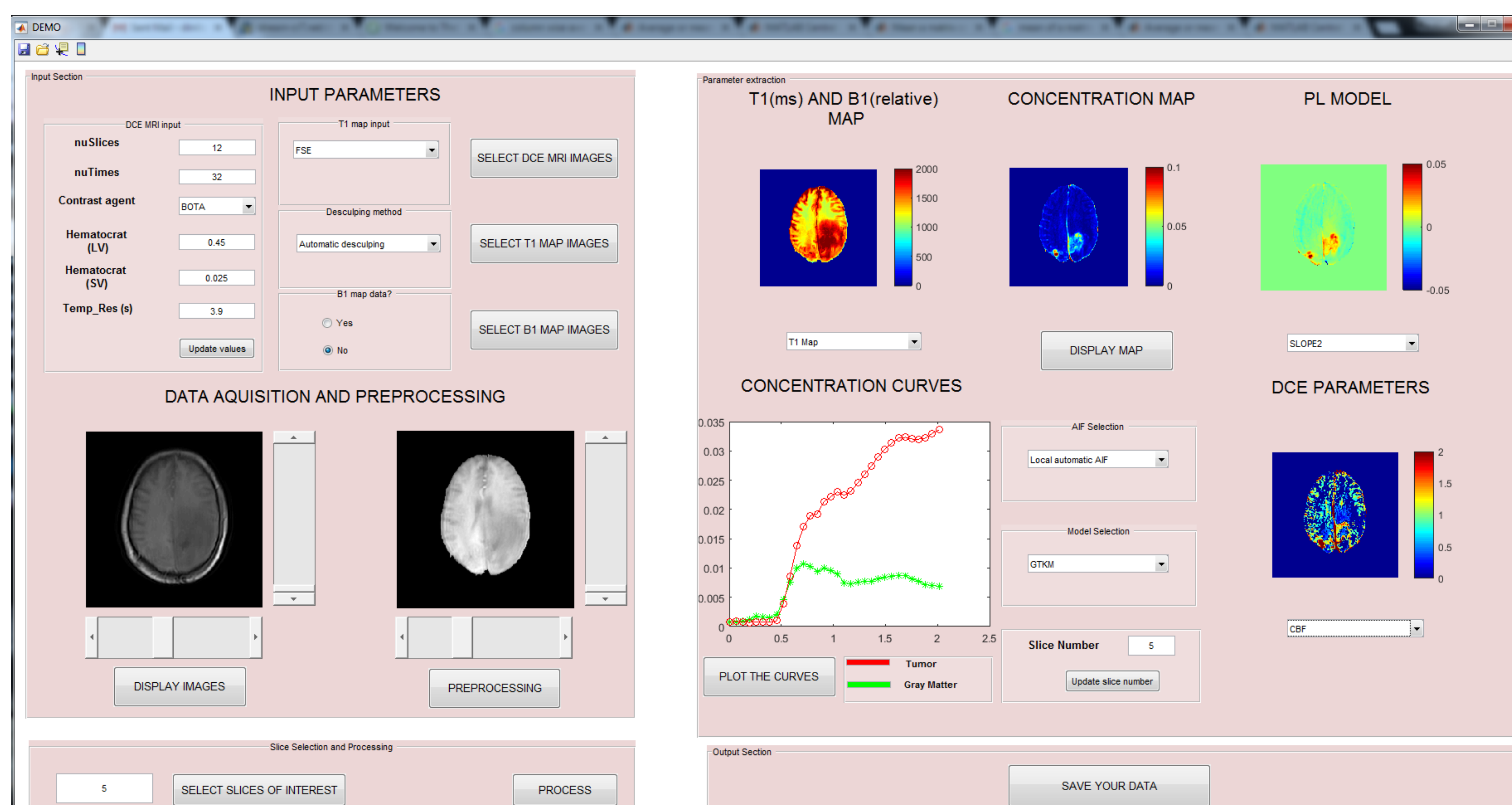
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DCE-MRI PROCESSING FLOWCHART



GUI: DCE-MRI ANALYSIS SOFTWARE TOOL



Contact email id: nillohit.anirban@gmail.com

Software to be available online: <http://web.iitd.ernet.in/~anupsm/>