

# selected writings on HYPR (Highly Constrained Backprojection for Time Resolved MRI)

Nasser M. Abbasi

California State University, Fullerton. Summer 2008

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From work on my final year school project, CSU Fullerton, summer 2008, for my MSc. in applied mathematics.

## reports

1. Mathematical formulation of the HYPR algorithms
2. my working notes on HYPR
3. Analysis of the algorithms
4. Power point slides in PDF format
5. Power point slides in PPT format
6. HYPR final report
7. HYPR final report short version in power points
8. HYPR short paper HTML
9. Dr Pineda's (CSUF Mathematics dept) "The Mathematics of HYPR"

## software

This software is free to use and modify for educational and research purposes only.

The following `HYPR_simulator_april_29_2015_Version_1_6.zip` file contains all the Matlab source code.

To Run:

Extract the zip file, it will create folder `HYPR_simulator_april_29_2015_Version_1_6`. Then start Matlab, and change directory to folder created above. Then type the command

```
nama_HYPR
```

Now 3 Matlab windows will come up. This was done on windows 7. Make sure your windows desktop display is set to display fonts at small size (default). Else the Matlab GUI might not show up correctly or fully on your desktop.

The font size on windows can be changes from `control panel\Appearance and Rationalization\Display`

Once the Matlab GUI comes up. There are 3 main windows. One is called the client. This is where selecting the algorithms, the image to test with and other configuration such as noise selection is done. Next, click on the button **Generate temporal images** which is located on the client windows. Wait a little until the image is shown. This should not take more than one minute or so. Next, click on the button called **generate HYPR frames**. This step should complete fast.

Next, move to the window **server 1** if not allready on it. And click on the **play** button, located at bottom of **server 1** window. Now the algorithm will run and you will see each time frame generated. Depending on how many time frames you selected, this can take few minutes to complete.

Now you can go back to the **client** window and click the **playback HYPR frames** if you want. This will play back the image reconstruction on the third window called **server 2** to make it easier to compare the quality of the original with the reconstructed image using the current configuration.

This step is not needed but it is there to use. I normally just use the client and the server 1 windows.

Now on the client window, you can change the algorithm or change the image to test with or the algorithm or the noise. And repeat the process in order to compare the quality of the reconstructed HYPR images using the different algorithms.

This tool is meant to learn how HYPR algorithm works and how each algorithm handles different images.