

How to submit your new HTML-based ISMRM syllabus contribution

The following are step by step instructions to complete your syllabus submission through the new HTML system.

Submission steps (with notes on changes):

1. [Authors](#)
 - Second authors can be added, but will only appear on your syllabus contribution
2. [Abstract](#)
 - Submission can be done in sections or as one copy and paste
 - [Formulas/Equations need to be added using MathJax](#)
3. [Figures](#)
 - Each syllabus can have up to 5 figures. Figure captions should be limited to 50 words.
 - Figures should be no larger than 2MB in size.
 - Tables should be added as Figures
4. [Abstract Details](#)
 - Requesting Permission to Record
 - We are requesting 100 word synopses this year. This will appear on the program at a glance
5. [Disclosure](#)
6. [Proofread](#)
7. [Submit \(Manage\)](#)

We have been advised that users should NOT have multiple tabs open at the same time.

1. Authors

This should be populated with your information, first name, last name, e-mail, etc. If you see an error you can edit your name using the edit button. If you want to add a second author you can select “Add New Author” and fill out the needed information. See Example below in figure.

Abstract ID: 2

1 2 3 4 5 6 7

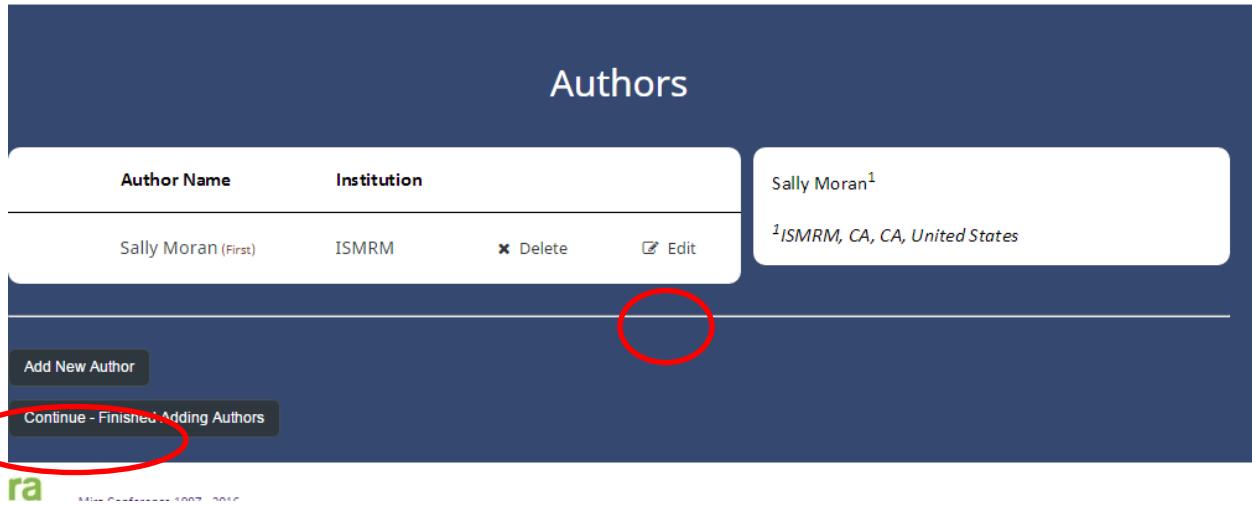
Authors Abstract Figures Abstract Detail Disclosure Proofread Manage

Authors

Author Name	Institution	
Sally Moran (First)	ISMRM	<input type="button" value="Delete"/> <input type="checkbox"/> <input type="button" value="Edit"/>

Sally Moran¹
¹ISMRM, CA, CA, United States

ra



2. Abstract

The best way to prepare your syllabus for submission is to write and organize your text in any common text editor (e.g. Microsoft Word, iWorks or even vi) without any special formatting. Each section can be entered individually and separated by a section header. Syllabus contributions are limited to a minimum of 500 words and a maximum of 1000.

In this window, you start with the title of your course/syllabus at the top. If you see an error in the title or would like to change it please contact the Education Department (Melissa.simcox@ismrm.org or Gerardo@ismrm.org).

Abstract ID: 336

1 Authors 2 Abstract 3 Figures 4 Abstract Detail 5 Disclosure 6 Proofread 7 Submit

Abstract

Abstract Title

Reorder my Sections Add New Section Save All Save and Continue with my Abstract

Section 1

Insert Equation Tag Insert Inline Equation Tag

Words: 1 Characters: 2

Add New Section

References

Insert Equation Tag Insert Inline Equation Tag

Words: 1 Characters: 1

Below this, the abstract is broken into separate sections. Each one is given a number just so that we can keep track of it, but you can give each section a title of your choosing. This could be “introduction” or “methods” or whatever you choose. **We have already included sections for “References” and “Acknowledgments”.** In the final document, all of these section titles will appear in a different font compared to the body of the text. Below the section title, there is a simple text box where the body text is entered. Again, it is best to copy and paste the text from your editor directly. Any other formatting that you copied in from your

previous document will be stripped. However, in this section, you can also add bold, italic and other formatting to your text.

Please hit “Save All” often to ensure that you don’t lose your work.

Once you are done with your first section, you can add more sections by clicking the “Add Section” button. This will give you another box to enter the section title and the body text for the next section. Continue this process until you are done entering all of the text. Once you’re done, hit “Save and continue with my abstract.”

Please note that there will be a separate place to enter your synopsis, so please don’t dedicate a section to the synopsis here.

Equations

We have found that individual Greek characters come across when copied from Microsoft Word. However, since the abstract will be rendered in HTML, equations are a separate issue. These will be entered using MathJax. For those who are unfamiliar with MathJax or those used to working in e.g. MathType, there are several equation toolboxes on the web. We suggest using [HostMath](#). To use tools such as this, you can use the buttons on the left to enter the mathematical symbols you need. You can constantly see an update of what your equation will look like on the right. Once you are satisfied with the equation, copy all of the text in the upper window to your document so that you can access it during the submission process.

In the upper right part of the text entry box, you can also see two different options for entering equations into the text. The first option is for an offset equation which is an equation that will be displayed on a line by itself. The second option is for an inline equation that will appear in the body of the text. There are two buttons to insert the flags for these two options. The “Insert Equation Tag” inserts a “\$\$” symbol, while the “Insert Inline Equation Tag” inserts a “\$\$\$. “

Please note that you need to have these tags on both ends of your equation or it won’t show up correctly.

Section 2

Methods

2000 and 3000. The Normalized Root Mean Square Error (NRMSE) values were computed for each map using the numerical ground truth. IMF-MRF was also evaluated on in-vivo data ($L=3000$ time points) at 3T on a Siemens [Skyra](#) (Erlangen, Germany) using the same imaging parameters as described previously (consent obtained from volunteer prior to experiment), at 1.17 mm² resolution. Analysis was performed for $L=300, 500, 1000$ and 3000. The maps obtained at $L=3000$ were used as an approximate ground truth to compute an indicative NRMSE value for each map. All computations were performed in Matlab R2012b programming environment ([The Mathworks, Natick, MA](#)), and nuFFT operations were done using the image reconstruction toolbox provided by Jeffrey [Fessler](#) 4. $$$$a+b=c$$$$ This line then continues here...

$$$a+b=c$$$

Words: 513 Characters: 3322

As you can see in the figure above, the format should be $$$a+b=c$$$ for offset equations or $$$$a+b=c$$$$ for inline equations. Thus the way you get your MathJax equation into this document is to paste the text you copied from HostMath in between these symbols. For example, $$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$$.

3. Figures

Figures

[Add New](#) [Save All](#) [Save and Continue](#)

-- OR --

[Upload No Files at this Time](#)

[Make this my primary file](#)

Figure: 1

[Select](#)

Caption:

Please enter a caption

Rich Text Editor

Words: 1 Characters: 1

[Save](#) Please save after any changes to update [Delete Figure and Caption](#)

Once you are done entering the text, you have the option of adding figures. These are done on the next screen. Start by hitting “Add New”. This gives you a separate gray area where you can select a file to upload and enter the figure caption. Hit the “Select” button at the top. This will bring up a window where you can point to the file on your local machine. These files can be in many formats including jpeg, gif, etc. Once the file is uploaded, you can enter the caption. Once you are done with the caption, hit “save” in the gray area to accept the file and caption. You should see a small preview appear in the gray area. **You can upload up to 5 figures for each syllabus. Figure captions are limited to 50 words each. There is a maximum file size of 2MB for each figure. Please upload tables as figures.**

The system does not automatically number the figure and table captions. Please add something like “Figure 1:” or “Table 1:” when you type in the caption.

If you have an image or figure, there is an additional button “Make this my primary file.” This is for a feature that we would like to implement this year. We are considering a “visual program book” that would highlight the best images from each abstract in a session. So to make this work, please choose the figure that is the image that you would like to visually represent your abstract as a whole. We need to have this checked by at least one figure in your abstract.

4. Abstract Detail

New this year, we are requesting a 100 word synopsis of your talk. This will appear on the online program, so a brief overview of your talk will do well.

On this page you will also give your permission to record.

5-7. Disclosure-Submit

After this point the remaining portion of the submission is the same as previous years. You can fill out the disclosure information of any relevant financial relationships you have.

Proofreading allows you to see your neatly formatted responsive HTML document like the example below, and submitting your work is the final step.

Multiscale Reconstruction for Magnetic Resonance Fingerprinting

Eric Pierre¹, Dan Ma¹, Yong Chen¹, Chaitra Badve¹, Mark Griswold¹

¹CWRU

Synopsis

To perform parameter mapping, Magnetic Resonance Fingerprinting (MRF) relies on highly efficient, highly undersampled trajectories to acquire the image series, yielding images contaminated by high aliasing noise. We propose an iterative multiscale method to denoise these images so as to reduce the number of time points required for accurate parameter mapping. The proposed method is shown to allow the simultaneous T1, T2, field inhomogeneity and proton density estimation at 1.17 mm² resolution *in vivo* from a single 5.1s acquisition, representing a potential 4-fold increase in acquisition speed for MRF methods.

Purpose

To noticeably reduce the number of time points L needed to obtain reliable parametric maps with MRF, thereby accelerating MRF acquisitions.

Methods

Our hypothesis is that MRF can accurately quantify tissue parameters at smaller L than previously reported¹ provided the random-like aliasing noise of fingerprints can be retrospectively reduced. Therefore a robust denoising scheme for these highly undersampled MRF images is proposed. It is designed for efficient trajectories with high sampling density at the center of k-space (e.g. spiral, radial or even music-derived²). This iterative Multi-Scale method (referred to as IMS-MRF) is initialized by applying a low-pass k-space Gaussian-weighting on the acquired data then applying the inverse non-uniform Fast Fourier Transform (nuFFT), yielding an initial low-resolution image series, but with reduced image artifacts. The width of the weighting is set as $\sigma_0 < k_{\max}$, where k_{\max} is the largest sampled k-space distance from the origin. Subsequent iterations consist of two steps: 1. Image series denoising. The temporal signal evolution for each pixel is replaced by its closest matching fingerprint, scaled by estimated pixel proton density (PD). 2. Image resolution increase. The nuFFT is applied on each denoised image to re-generate fully sampled k-space data. For each sampled k-space location the signal is replaced by the actual acquired data with lighter Gaussian weighting than the previous iteration (itter > oitter-1). If oitter > k_{\max} , no weighting is applied and acquired data is used at full resolution. Finally the inverse nuFFT is applied. When convergence is reached (at full resolution), parametric maps are obtained through template matching of the final image series. IMS-MRF was first tested on a 256x256 numerical brain phantom, using the numerical T1, T2 and PD maps obtained from the MNI brain atlas³, and a simulated inhomogeneity field ΔB_0 linearly varying from -60 to +60 Hz, left to right. A series of L=3000 time points were simulated based on the tissue parameter values and the TR and Flip Angle (FA) series in Fig 1. Complex normally distributed noise was added to the images (SNR=100). The nuFFT was applied on each image to a variable density spiral (VDS) trajectory to simulate k-space measurements (Fig 1, right). The VDS trajectory was undersampled by a factor 48, and rotated by $2\pi/48$ every TR. For the first 3 iterations, σ_0 was chosen empirically as $\sigma_0=k_{\max}/8$, $\sigma_1=k_{\max}/4$ and $\sigma_2=[k_{\max}/3]/4$. No Gaussian weighting was applied on subsequent iterations. Parameter maps were computed after N iterations, both with the original MRF¹ and IMS-MRF methods using L=300, 500, 1000, 2000 and 3000. The Normalized Root Mean Square Error (NRMSE) values were computed for each map using the numerical ground truth. IMF-MRF was also evaluated on *in-vivo* data (L=3000 time points) at 3T on a Siemens Skyra (Erlangen, Germany) using the same imaging parameters as described previously (consent obtained from volunteer prior to experiment), at 1.17 mm² resolution. Analysis was performed for L=300, 500, 1000 and 3000. The maps obtained at L=3000 were used as an approximate ground truth to compute an indicative NRMSE value for each map. All computations were performed in Matlab R2012b programming environment (The Mathworks, Natick, MA), and nuFFT operations were done using the image reconstruction toolbox provided by Jeffrey Fessler⁴.

Figures



Fig 1

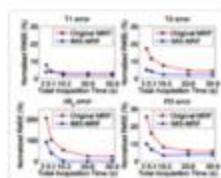


Fig 2

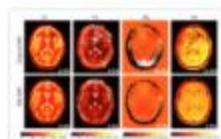


Fig 3

If you have trouble with any part of this process please email or contact us at the office. Thank you for your contribution and hard work to the meeting. We look forward to seeing you in Paris!

All the best,

The ISMRM Education Department

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