

ISMRM Workshop on: Motion Correction in MRI & MRS

Cape Town, South Africa • 08–11 September 2017

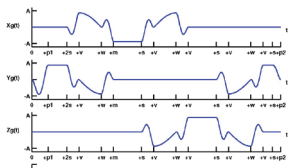
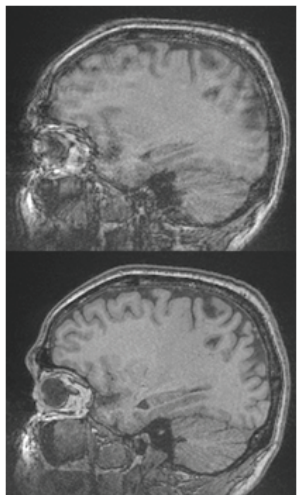


TARGET AUDIENCE: This workshop is designed for new MR scientists interested in learning and becoming involved in motion correction; experienced researchers interested in meeting with fellow researchers to learn and share cutting-edge techniques for motion correction; clinicians interested in applying the latest correction methods to solve their motion problems; researchers interested in how motion affects their research and how they can reduce or eliminate bias in their research conclusions; and industry representatives wanting to discuss the integration of tracking hardware with the standard MR platforms.

COMMITTEE CHAIRS:

Co-Chair:
Andre J.W. van der Kouwe, Ph.D.
Massachusetts General Hospital
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OVERVIEW

This workshop will explore the effects of motion on clinical and research scans. Motion during clinical scans incurs substantial cost to radiology departments, as well as substantial motion-induced bias and possible erroneous conclusions based on motion-affected research scans.

Motion damage will be assessed in terms of the images themselves and based on motion measured using tracking techniques. Understanding image artifacts using simulations and processing images to remove the artifacts will be considered. Most of the workshop will be devoted to learning about the latest techniques of motion detection and correction (prospective and retrospective). Intrinsic (self-navigating and navigator-based techniques) and extrinsic approaches (external tracking systems such as RF markers, cameras and other sensors) will be considered, and hybrid approaches (prospective and retrospective, navigator and external tracker) will also be discussed. Secondary effects of motion beyond simple changes in position (spin history and position-dependent B_0 and B_1 changes) will be considered.

The research community has developed a wide range of approaches that are not commonly used or incorporated in any product. We will discuss specific solutions and their implementation with manufacturers. We also welcome presentations by the growing group of tracking device manufacturers, and encourage a discussion about interfacing these devices with the standard scanners.

EDUCATIONAL OBJECTIVES

Upon completion of this activity, participants should be able to:

- Summarize the underlying causes of motion artifacts in MR images;
- Discuss the effects of motion on clinical and research scans and research conclusions;
- Compare real-time and offline approaches to correcting motion-damaged images and spectra;
- Apply methods to quantify the amount of motion damage to a scan (image or spectrum);
- Apply methods to simulate motion damage (on the scanner and numerically offline);
- Recognize coordinate systems and transformations, and registration (K-space and object space);
- Assess the latest work on intrinsic motion tracking and correction methods (self-navigating sequences, navigator techniques for motion detection and correction);
- Assess the latest work on extrinsic motion estimation techniques (external optical, RF marker, and other systems) and how they interface with the scanner;
- Describe how motion correction methods can be effectively and efficiently applied in clinical workflow and research studies;
- Review the effects of motion beyond changes in position (spin history, B_0 and B_1 effects), and how these are measured and corrected; and
- Evaluate the future direction of motion correction in magnetic resonance.

**FOR MORE INFORMATION INCLUDING HOUSING & REGISTRATION, PLEASE VISIT:
www.ismrm.org/workshops/MoCor17/ OR CALL: +1 510 841 1899**