Bringing Image Acceleration & Automation into the Clinic: Opportunities and Challenges

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ABSTRACT: Medical imaging is rapidly moving in the direction of ever increasing image acquisition speeds. Doing so permits improved detection and quantification of dynamic processes, and/or minimizes the effect of patient/physiologic motion. One increasingly common technique to accelerate MR imaging is to simply acquire less data (i.e. sub-Nyquist sampling) while utilizing a Compressed Sensing approach to image reconstruction. Such an approach is now widely used in research, but challenges to clinical implementation remain.

The acquisition of ever more images also comes at a cost to the clinical radiologist who must interpret this data; i.e., they suffer from information overload in trying to interpret the consequently larger volume of data. Automation of methods to synthesize this data through novel analysis algorithms, into a form more amendable to clinical interpretation, is therefore critical.

In my lab we are pursuing multiple research avenues that look to improve both the acquisition and analysis of diagnostic imaging data, with an aim of translating this technology into better clinical diagnostics. In this talk, I will specifically focus on our work in developing functional neuroimaging tools for creating a completely automated and data-driven workflow for use in pre-surgical planning. Examples of the application of this approach to Functional MRI (fMRI) and Magnetoencephalography (MEG) will be given.

ALL ARE WELCOME!!!