

Research Fellowship in Novel Acquisition Strategies for Diffusion MRI

A post-doctoral position to develop acquisition strategies for diffusion MRI is available at the Martinos Center for Biomedical Imaging, Massachusetts General Hospital (MGH) and Harvard Medical School (HMS) in Boston under the supervision of [Dr Susie Huang](#) and [Dr Berkin Bilgic](#). This fellowship in image encoding and sequence development will be supplemented with further training in clinical translation and application in neuroscientific imaging through a team of collaborating faculty at MGH/HMS.

The position will capitalize on state of the art clinical 3T magnets (Siemens: Vida, Prisma, Skyra; GE: Premier), while the developed software technologies will be able to take advantage of additional cutting edge hardware housed at the Martinos Center, such as the unique Connectome 2.0 magnet (with 500 mT/m maximum gradient and 600 T/m/s slew rate), Terra 7T scanners, Skope field monitoring systems, combined B0 shim/radiofrequency “AC/DC” coils as well as a multi-channel TMS head coil. Additional systems that will become operational within a year include a Cima.X scanner (with 200 mT/m gradients) as well as an “Impulse” gradient update that will push the Terra’s gradient specifications to 200 mT/m max gradient and 900 T/m/s slew rate. This synergistic approach that combines software and hardware technologies exemplifies the collaborative environment at the Martinos Center.

The acquisition methods that will be explored span a range of applications in neuroimaging (e.g. aging, neurodegenerative diseases) and contrast mechanisms (e.g. diffusion, relaxometry, susceptibility). Potential research foci include,

- i. high-resolution neuroimaging at the mesoscale to examine cortical architecture,
- ii. efficient quantitative imaging to map biophysical tissue parameters and probe tissue composition,
- iii. development of novel readouts to exploit Connectome 2.0’s ultra-high gradient amplitude and slew rates,
- iv. incorporation of field monitoring into the reconstruction to boost the fidelity of such novel readouts.

The position provides a valuable opportunity to collaborate with a diverse group of researchers developing cutting edge technology that will impact both the neuroscience and clinical research communities. This role will also provide an opportunity for a strong academic-industrial partnership with e.g. GE Healthcare and Siemens Healthineers in translating new technologies into commercial products.

A PhD in electrical/biomedical engineering, physics, or a related field is required. The ideal candidate should have a strong analytical background while displaying a high level of creativity. The candidate should have first-hand experience in MR physics and pulse sequence programming. Experience with Pulseseq, and Siemens IDEA and GE EPIC environments are desirable.

Application: Enquiries may be directed to Drs. Huang (susie.huang@mgh.harvard.edu) and Bilgic (bbilgic@mgh.harvard.edu). If desired, further information can be provided in an in-person meeting in Singapore. The position is full-time with benefits and is available immediately. MGH is an Equal Opportunity/Affirmative Action Employer.

