Research Fellowship in Novel Acquisition and Reconstruction for Efficient MRI

A post-doctoral position to develop acquisition and reconstruction strategies for efficient MRI is available at the Martinos Center for Biomedical Imaging, Massachusetts General Hospital (MGH) and Harvard Medical School (HMS) under the supervision of Dr. Berkin Bilgic. This fellowship in image encoding, reconstruction 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 systems housed at the Martinos Center, such as the Terra and Magnetom 7T scanners, high-performance 3T Connectom magnet, two MR-PET scanners, Skope field monitoring systems, combined B0 shim/radiofrequency “AC/DC” coils as well as a multi-channel TMS head coil. This synergistic approach that combines software and hardware technologies exemplifies the collaborative environment at the Martinos Center.

The acquisition and reconstruction methods that will be explored span a wide range of applications (e.g. in brain, abdomen, fetal imaging) and contrast mechanisms (e.g. relaxometry, susceptibility, diffusion, BOLD). Potential research foci include,

i. high-resolution neuroimaging at the mesoscale to examine structural and functional architecture of the cortex,
ii. efficient quantitative imaging to map biophysical tissue parameters and probe tissue composition,
iii. open source imaging for harmonization of data acquisition, reconstruction and analysis, and easy dissemination,
iv. rapid, motion-robust, high-fidelity abdominal and fetal imaging, and
v. synergistic combination of scan-specific / self-supervised deep learning with physics-based reconstruction.

The position provides a valuable opportunity to work and 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 Siemens Healthineers, GE Healthcare and Subtle Medical in translating new technologies into commercial products. An example of technology that has been successfully translated is the wave-CAIPI technique for efficient high-resolution imaging, which has been distributed to a large number of research and clinical sites worldwide and is now a Siemens product.

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, reconstruction algorithms and/or pulse sequence programming. Experience with Matlab and Python, and Siemens IDEA and GE EPIC environments are desirable.

Application: Enquiries may be directed to Dr. Bilgic (bbilgic@mgh.harvard.edu). Applicants should send a CV, cover letter and contact information of referees.

The position is full-time with benefits and is available immediately. MGH is an Equal Opportunity/Affirmative Action Employer.