

Research Fellowship in Acquisition and Reconstruction Strategies for High-Fidelity MRI

A post-doctoral position to develop acquisition/reconstruction strategies for high-fidelity MRI is available at the Harvard Medical School via a joint appointment between Boston Children's Hospital (BCH) and Martinos Center (at Massachusetts General Hospital, MGH) under the supervision of [Dr Borjan Gagoski](#), [Dr Berkin Bilgic](#) and [Dr Jason Stockmann](#).

The position will capitalize on state of the art clinical 3T magnets (Siemens: Vida, Prisma, Skyra, Cima; GE: Premier), while the developed software will take advantage of cutting-edge hardware, such as the Connectome 2.0 ($G_{\max}=500$ mT/m, $S_{\max}=600$ T/m/s), a clinical Terra.X 7T scanner as well as a Terra.X equipped with the Impulse gradients ($G_{\max}=200$ mT/m, $S_{\max}=900$ T/m/s). These are complemented by bespoke hardware including 3T/7T Skope field monitors, combined B0 shim/receive "AC/DC" coils as well as a multi-channel TMS head coil. The synergistic approach combining software and hardware technologies exemplifies the collaborative environment between BCH and the Martinos Center.

The acquisition methods that will be explored span a range of applications (e.g. rapid clinical imaging, motion correction, imaging children with dental braces) and contrast mechanisms (e.g. diffusion, relaxometry, susceptibility, structural imaging). Potential research foci include,

- tailored acquisitions with AC/DC arrays for high fidelity clinical imaging in children with braces,
- motion correction and self-supervised AI reconstruction to improve data fidelity,
- efficient quantitative imaging to map biophysical tissue parameters and probe tissue composition,
- motion-robust, fat/water encoded abdominal imaging,
- use of field monitoring and pTx to boost the fidelity of such novel acquisitions at 7T.

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

A PhD in electrical/biomedical engineering, physics, or a related field is required. The candidate should have experience in MR physics, image reconstruction and sequence programming. Experience with Pulseseq, and Siemens IDEA and GE EPIC/KS Foundation environments are desirable.

Application: Please reach out to Drs. Gagoski (borjan.gagoski@childrens.harvard.edu), Bilgic (bbilgic@mgh.harvard.edu) and Stockmann (jstockmann@mgh.harvard.edu) for inquiries.

