UNIVERSITY OF CENTRAL FLORIDA

CENTER FOR RESEARCH IN COMPUTER VISION

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"Learning to Reconstruct for MRI "

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ABSTRACT

Lengthy data acquisition times remain a bottleneck in magnetic resonance imaging (MRI). Thus accelerated imaging methodologies have received great interest over the last three decades. Recently, deep learning (DL) techniques have gathered interest as a means to improve reconstruction quality for accelerated MRI. DL-based reconstruction techniques can be broadly divided into two categories, data-driven and physics-driven. The former methods learn a mapping from aliased images/k-space to artifact-free images/k-space. In the physics-driven approaches, the knowledge of the forward encoding operator is taken into account in solving an inverse problem.

In this talk, we will concentrate on physics-driven approaches. We will specifically focus on novel self-supervised training strategies for such reconstruction algorithms when ground-truth data is not available, which is a common problem in MRI. We will also discuss how we can use insights from optimization theory to design better neural network structures .

BIOGRAPHY

Mehmet Akçakaya is a McKnight-Land Grant Assistant Professor at the University of Minnesota. He received the Bachelor's degree with great distinction from McGill University, Montreal. He received the Ph.D. degree from Harvard University, Cambridge, MA in 2010. He was an Instructor at the Harvard Medical School (Beth Israel Deaconess Medical Center) prior to joining the University of Minnesota. His work on accelerated MRI has received a number of international recognitions. He was the recipient of an R00 Award from NIH and a CAREER Award from NSF. His research interests include image reconstruction, cardiac MRI, machine learning, inverse problems and signal processing.