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Inverse Problems Seminar

Physics-Driven Deep Learning for MRI

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Abstract

Fast MRI can be mathematically modeled as an inverse problem, and regularization is a crucial tool to achieve stable and accurate solutions. However, the acceleration rates of conventional MRI methods using traditional regularization have approached their limits. In recent years, deep learning methods have garnered increasing attention and are widely regarded as a breakthrough for further accelerating imaging. Nevertheless, existing deep learning imaging methods mostly lack the necessary interpretability, exposing imaging to the risk of instability. Fortunately, in contrast to general natural image processing problems, MRI is rooted in electromagnetic physical principles. Therefore, we propose a physics-driven learnable regularization approach, wherein the design of inference algorithms, network structures, and loss functions is guided by physical principles. This results in a series of interpretable deep learning methodologies for MRI.

Date: December 20, 2023 (Wednesday)
Time: 3:00pm – 4:00pm (Hong Kong Time)
Venue: LSB 222, CUHK

All are Welcome