

Ideal and human observer models for signal detection in X-ray tomographic imaging

Speaker: Emil Sidky, University of Chicago

Abstract: In solving inverse problems related to X-ray tomography, the measure of success involves some form of distance from the ground truth such as root-mean-square error (RMSE). In medical imaging applications of X-ray tomography, however, the majority of clinical imaging tasks involve some form of signal detection. Signal detection performance provides a metric of performance of tomographic systems that yields complimentary information to image fidelity metrics such as RMSE. Signal detection models are also differentiated by those that represent the so-called ideal observer and the human observer. The former yields the upper limit in signal detection, while the latter measures how an actual human would perform on signal detection. In this talk, both ideal and human model observers for signal detection will be presented in addition to their application to parameter tuning for X-ray tomographic image reconstruction.