

Ill posed operators and Regularization

Abstract: In the context of an inverse problem, given a linear operator between Hilbert spaces, we are often required to find an inverse of some element in the codomain. But it may happen that such an element is not unique, may not exist, or may not be stable. If the operator does not have a bounded inverse, a small perturbation in the data value can create a large error in the ground truth. These are called ill posed operators and various regularization methods are used to find a stable inverse. We will talk about the Tikhonov regularization method and how stability is achieved with perturbed data.