FACULTY MENTOR   Pal, Piya

PROJECT TITLE   Blind Deconvolution and Super resolution Imaging

PROJECT DESCRIPTION

Blind deconvolution is a cornerstone problem in imaging where the goal is to reconstruct an image from its "blurred" version, where the blurring occurs due to convolution with an unknown impulse response (or kernel). The problem has been studied for decades and numerous heuristics have been proposed, and yet fundamental questions regarding their ability to perfectly recover the image largely remain open. The problem becomes even more challenging in the setting of super-resolution imaging, where the goal is to recover "details" in the original image which are beyond the traditional resolution limits of the imaging system. In this project, we will study and analyze this fascinating problem using a suite of modern convex optimization techniques, which provide a partial unification of blind deconvolution problems for certain classes of images. We will also explore the role of non-uniform and sequential stochastic sampling on the ability to super-resolve point sources of light.

INTERNS NEEDED   1 MS Student AND 1 Undergrad Student

PREREQUISITES

MS student: Background in Linear Algebra and Signal Processing (required), Convex Optimization (Preferred).

Undergraduate Student: Basic DSP, MATLAB.