Solving Linear Inverse Systems with Graph Cuts

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Abstract

Computer vision is a rich source of important yet intractable optimization problems. Over the past decade, researchers have shown that many such problems can be efficiently solved by graph cuts. Graph cut algorithms combine elegant theoretical properties with compelling experimental results. I will focus on the difficult but important challenge of solving rank-deficient linear inverse systems. Such systems arise in many important image-processing applications, and can be solved with convex optimization methods by assuming the output should be globally smooth. More realistic assumptions, such as piecewise smoothness, lead to intractable optimization problems. I will present some preliminary evidence that graph cuts can be effective for an important class of linear inverse systems.

This is joint work with several collaborators, but primarily Ashish Raj (Cornell).