A damped Newton algorithm for Generated Jacobian Equation

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Abstract

In non-imaging optics, we try to optimize the trajectory of the light from a source to a target without trying to form an image of the source on the target. Some non-imaging optic problems can be translated into optimal transport problems in a semi-discrete setting, meaning that the source is a continuous domain and the target is a finite set of points. Other problems of non-imaging optics can sometimes be rewritten into a slightly more global form than optimal transport, which we call Generated Jacobian Equations. During this presentation we will focus on these Generated Jacobian Equations, also in a semi-discrete setting. We will begin by introducing them using a non-imaging optic problem, and make the link with optimal transport. We will then present an algorithm to solve Generated Jacobian Equations, which was adapted from an existing algorithm to solve optimal transport problems. And finally we will detail the main lines of the proof of convergence of this algorithm.

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