1086-28-496 **Otis Chodosh**, **Vishesh Jain**, **Michael Lindsey*** (`lindsey3@stanford.edu`), **Lyuboslav Panchev** and **Yanir A. Rubinstein**. *Visualizing optimal transportation maps.* Preliminary report.

Given two sufficiently regular probability measures μ and ν on R^n, general results due to Brenier (1987) guarantee the existence and uniqueness of an optimal transportation map between them, that is a map $T : R^n \to R^n$ such that $T_{\#}\mu = \nu$ and the quadratic cost $\int_{R^n} |T(x) - x|^2 d\mu(x)$ is minimized. However, in general it is hard to say much about the map, let alone give an explicit expression for it. We present an efficient computer algorithm that uses a discretization of the problem to give perhaps the first pictures and movies of optimal transportation plans, for domains in R^2. These suggest subtle relations between the geometry of the support of μ and ν and the regularity of T, some of which we are able to prove. (Received September 05, 2012)