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*An improvement of the primal-dual algorithm when applied to the discrete  
Monge-Kantorovich mass transfer problem*

The primal-dual algorithm for the transportation problem consists essentially of three updating steps, namely 1) the updating of the dual variables, 2) the updating of the admissible arcs and 3) the updating of the flow. For integer problems, by restricting the change of dual variables to +1 or -1, the computation time for updating the dual variables is simple and fast once the labelling step is done, but then the determination of the new admissible arcs requires more work. In this talk I will present some simple observations by which one can reduce the the computation time considerably for 1) the updating of the dual variables and 2) the determination of new admissible arcs, when the primal-dual algorithm is applied to the discrete Monge-Kantorovich mass transfer problem. In case the solution to the Monge-Kantorovich mass transfer problem is used as a distance measure between digital images of equal total grey value then experiments indicate a computational complexity of order  $O(N^2)$ .