Algorithms for the Multiclass Network Equilibrium Problem

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We consider a nonatomic congestion game on a connected graph, with several classes of players. Each player wants to go from its origin vertex to its destination vertex at the minimum cost and all players of a given class share the same characteristics: cost functions on each arc, and origin-destination pair. Under some mild conditions, it is known that a Nash equilibrium exists, but the computation of an equilibrium in the multiclass case is an open problem for general functions. We consider the specific case where the cost functions are affine and propose a polynomial algorithm solving the problem when the graph consists in parallel arcs - a pivoting algorithm adapted from Lemke for general graphs. The talk will introduce all necessary notions for non specialists of game theory.