Title   : Traffic Optimization For a Mixture of Self-interested and
            Compliant Agents
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Abstract: This paper focuses on two commonly used path assignment
policies for agents traversing a congested network: self-interested
routing, and system-optimum routing. In the self-interested routing
policy each agent selects a path that optimizes its own utility,
while the system-optimum routing agents are assigned paths with the
goal of maximizing system performance. This paper considers a
scenario where a centralized network manager wishes to optimize
utilities over all agents, i.e., implement a system-optimum routing
policy. In many real-life scenarios, however, the system manager is
unable to influence the route assignment of all agents due to
limited influence on route choice decisions. Motivated by such
scenarios, a computationally tractable method is presented that
computes the minimal amount of agents that the system manager needs
to influence (compliant agents) in order to achieve system optimal
performance. Moreover, this methodology can also determine whether a
given set of compliant agents is sufficient to achieve system
optimum and compute the optimal route assignment for the compliant
agents to do so. Experimental results are presented showing that in
several large-scale, realistic traffic networks optimal flow can be
achieved with as low as 13% of the agent being compliant and up to
54%.