ABSTRACT: In recent years, commuters are increasingly relying on traffic navigation applications (e.g., Waze, Google maps) to decide their routes and departure times. This talk focuses on the question of estimating the social value of such navigation systems. We present a game theoretic framework to model routing strategies in environments where the route costs are affected by a random network state, and commuters have heterogeneous access to information regarding the state. The framework enables modeling of commuters’ private beliefs of the network state and of the other commuters. We conduct equilibrium analysis of Bayesian congestion games under a range of information structures introduced by navigation applications. Our results suggest that access to information reduces costs to individual informed commuters, but the relative value of information can be zero (or even negative) if many commuters are highly informed. Moreover, there exists a fraction of informed commuters above which the aggregate social cost may increase.

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