

1099-90-283

Giovanni Petri, Torino, Italy, and **Samuel V Scarpino*** (scarpino@santafe.edu), Santa Fe, NM. *Local and nonlocal information in a traffic network: how important is the horizon?*

Recent advances in distributed sensor network technology have changed the landscape of traffic optimization in which small, mobile devices are able to sense local information and communicate in real time with one another. Naive optimization algorithms that operate solely on the local or global level are inherently flawed, as global optimization requires sensors to communicate with a centralized base-station, creating prohibitive bandwidth, robustness, and security concerns, while local optimization methods are limited by a near information horizon. Here we investigate an intermediate approach where individual sensors are able to propagate congestion information over a variable distance. For this study, we considered both stylized, random graphs and empirical road networks. Our intermediate strategy consistently outperformed a naive strategy, where every car follows the shortest network path to its destination, but was outperformed by an optimization algorithm that only incorporated local information. The results suggest that local information may represent an upper-bound on performance in models of cascading information. (Received February 10, 2014)