Optimal Hotelling Auctions

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Abstract:
We derive the optimal mechanism for a seller that offers differentiated products at each end of the Hotelling line, assuming that buyers have linear transportation costs and private information about their locations. The problem exhibits countervailing incentives and worst-off types that are endogenous to the allocation rule. We show that optimal mechanisms are characterized by a useful saddle point condition: Worst-off types minimize a virtual surplus function, while the optimal allocation rule maximizes the designer's expected virtual surplus. If buyers' gross valuations are sufficiently large, then the optimal mechanism involves entering some types in a lottery, even when all buyers are served. The set of types that are subject to random allocation varies with the type distribution, the number of buyers and the number of goods at each location. We also provide a two-stage clock auction implementation of the optimal mechanism.