Procurement Policies for Mobile-Promotion Platforms

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Mobile-Promotion platforms such as Cidewalk (www.cidewalk.com) and Sitescout (www.sitescout.com) enable advertisers (individual users or businesses) to directly launch their personalized mobile advertising campaigns. These platforms contract with advertisers to provide a certain number of impressions on mobile apps in their desired sets of geographic locations (usually cities or zip codes) within their desired time durations (for example, a month); the execution of each such contract is referred to as a campaign. In practice, campaigns arrive dynamically over time and the platform bids in real-time at an ad exchange to win mobile impressions arising over the desired sets of locations of these campaigns to fulfill their respective demands. Our analysis in this paper offers a rolling-horizon procedure in which the platform periodically recomputes its procurement (or bidding) policy and its policy for allocating the impressions (that have been won) to the various campaigns. For the basic problem of the rollinghorizon procedure, our main result is an effective procurement and allocation policy. Specifically, we obtain a theoretical bound on the performance of our policy and demonstrate the attractiveness of this bound for realistic values of the problem parameters, estimated using data from Cidewalk. By simulating a realistic setting of dynamically-arriving campaigns, we show that the computational time for the rolling-horizon procedure is reasonable for real-world implementation. Finally, by isolating important structural features of a given set of campaigns the extent of overlap in their locations, the heterogeneity in procurement costs across these locations and the total demand for impressions — they offer procurement-policy recommendations for a variety of practical settings based on these features.