Accepted Manuscript

Exploring the Optimal Granularity for Market Segmentation in RTB Advertising via Computational Experiment Approach

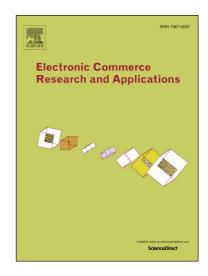Rui Qin, Yong Yuan, Fei-Yue Wang

Exploring the Optimal Granularity for Market Segmentation in RTB Advertising via Computational Experiment Approach

Rui Qin[a,b,d], Yong Yuan[a,b*], Fei-Yue Wang[a,b,c]

[a]The State Key Laboratory of Management and Control for Complex Systems,
Institute of Automation, Chinese Academy of Sciences, Beijing, China
[b]Institute of Parallel Economics, Qingdao Academy of Intelligent Industries, Qingdao, China
[c]Research Center of Military Computational Experiments and Parallel System,
National University of Defense Technology, Changsha, China
[d]Beijing Engineering Research Center of Intelligent Systems and Technology,
Institute of Automation, Chinese Academy of Sciences, Beijing, China
E-mails: rui.qin@ia.ac.cn, yong.yuan@ia.ac.cn, feiyue.wang@ia.ac.cn

Abstract

Real Time Bidding (RTB) is a novel business model of online computational advertising, developing rapidly with the integration of Internet economy and big data analysis. It evolves the business logic of online ad-delivery from buying "ad-impressions" in websites or ad slots to directly buying the best-matched "target audiences", and thus can help advertisers achieve the precision marketing. As a critical part of RTB advertising markets, Demand Side Platforms (DSPs) play a central role in matching advertisers with their target audiences via cookie-based data analysis and market segmentation, and their segmentation strategies (especially the choice of granularity) have key influences in improving the effectiveness and efficiency of RTB advertising markets. Based on a mathematical programming approach, this paper studied DSPs' strategies for market segmentation, and established a selection model of the granularity for segmenting RTB advertising markets. With the computational experiment approach, we designed three experimental scenarios to validate our proposed model, and the experimental results show that: 1) market segmentation has the potential of improving the total revenue of all the advertisers; 2) with the increasing refinement of the market segmentation granularity, the total revenue has a tendency of a rise first and followed by a decline; 3) the optimal granularity of market segmentation will be significantly influenced by the number of advertisers on the DSP, but less influenced by the number of ad requests. Our findings show the crucial role of market segmentation on the RTB advertising effect, and indicate that the DSPs should adjust their market segmentation strategies according to their total number of advertisers. Our findings also highlight the importance of

---

*Corresponding author