Algorithmic Challenge in Online Advertising

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Computational advertising is an emerging new scientific sub-discipline, at the intersection of large scale search and text analysis, information retrieval, statistical modeling, machine learning, classification, optimization, and microeconomics. The central challenge of computational advertising is to find the "best match" between a given user in a given context and a suitable advertisement. The context could be a user entering a query in a search engine ("sponsored search") , a user reading a web page ("content match" and "display ads"), a user watching a movie on a portable device, and so on. The information about the user can vary from scarily detailed to practically nil. The number of potential advertisements might be in the billions. Thus, depending on the definition of "best match" this challenge leads to a variety of massive optimization and search problems, with complicated constraints.

This talk will give an introduction to this area focusing mostly on the algorithmic challenges encountered in practice.