

**Profit Maximization for Viral Marketing in Online Social Networks Algorithms and analysis**

**Abstract:**

Information can be disseminated widely and rapidly through Online Social Networks (OSNs) with “word-of-mouth” effects. Viral marketing is such a typical application in which new products or commercial activities are advertised by some seed users in OSNs to other users in a cascading manner. The selection of initial seed users yields a tradeoff between the expense and reward of viral marketing. In this paper, we define a general profit metric that naturally combines the benefit of influence spread with the cost of seed selection in viral marketing. We carry out a comprehensive study on finding a set of seed nodes to maximize the profit of viral marketing. We show that the profit metric is significantly different from the influence metric in that it is no longer monotone. This characteristic differentiates the profit maximization problem from the traditional influence maximization problem. We develop new seed selection algorithms for profit maximization with strong approximation guarantees. We also derive several upper bounds to benchmark the practical performance of an algorithm on any specific problem instance. Experimental evaluations with real OSN datasets demonstrate the effectiveness of our algorithms and techniques.