Online ad markets play an important role in the Internet ecosystem. The main focus of the thesis is on optimization and observation of ad assignments in online ad markets.

* We introduce adscape, advertising landscape and develop a crawling capability which allows to harvest ads from across a number of websites and user profiles. We establish that user profiles are essential in display ad markets.

* We introduce and analyze cardinal auctions, in which bidders, in addition to their bid, specify their constraint on the maximum size of the allocation in which they are willing to participate.

* We observe that although advertisers bid and pay per click they have a maximum amount they are willing to pay per conversion. We capture this motivation in the problem of ad allocation with secondary targets.

In this talk I will mainly present the the work on ad allocation with secondary targets. We will discuss the problem and a number of theoretical approaches to it. Finally, we will present experiments with ad allocation we have conducted in a real-world ad network.