

# Summer of Code - Machine Learning with Economics

## Kartik Vuthoo

### Double Auctions in Online Advertising: Determining the Price of Ad Impressions

Most internet companies that are free for their consumers make money on advertisements. This alone accounts for \$700 B in total digital ad spend. It has become a vital component of the digital economy, revolutionizing the way businesses promote their products and services to a global audience.

As the online advertising ecosystem continues to evolve, the determination of ad prices has become a crucial aspect of this dynamic industry.

Double auctions, a market mechanism widely employed in online advertising, play a fundamental role in determining the price of ad impressions, ensuring fair competition, and optimizing resource allocation.

The objective of this project is to comprehensively explore the utilization of double auctions in the online advertising domain, focusing specifically on their application in determining the price of ad impressions.

By delving into the underlying mechanisms, investigating the factors influencing bidding behaviors, and analyzing the impact on market efficiency, this study aims to provide a deep understanding of how double auctions shape the pricing dynamics in online advertising.

Understanding the functioning of double auctions in the context of online advertising is of utmost importance, as it influences the revenue generation for publishers, the effectiveness of advertising campaigns for advertisers, and the overall sustainability of the digital advertising ecosystem.

Through a combination of theoretical analysis, empirical research, and case studies, this research aims to shed light on the intricacies of double auctions and their role in determining ad prices.

By addressing these research questions, this study aims to contribute to the existing body of knowledge in the field of online advertising and auction theory. The findings of this research will provide valuable insights for industry practitioners, advertising platforms, and policymakers, assisting them in making informed decisions to enhance market efficiency, transparency, and sustainability in the online advertising ecosystem.

In conclusion, this thesis endeavors to provide a comprehensive analysis of the role of double auctions in determining the price of ad impressions in online advertising. By examining the mechanisms, factors, and implications associated with these auctions, this research aims to deepen our understanding of the pricing dynamics in the digital advertising industry and pave the way for more effective and efficient advertising practices.