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amazon | science

SERP Interference Network and its Applications in Search Marketing

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Next Steps

Introduction

SERP Interference Network

Paid Search Shopping Ads

reebok shoes

						
Reebok - Unisex Club ...	Reebok - Unisex-Adult...	Reebok - Unisex-Adult...	Reebok - Unisex Club ...	Reebok - Men's Club MENT...	Reebok Nano X2 Men's...	Reebok Classic
\$50.00	\$30.00	\$26.15	\$90.00	\$47.99	\$69.97	\$34.98
Amazon.com Free shipping	Amazon.com	Amazon.com 30-day retur...	Reebok ★★★★★ (779)	Amazon.com Free shipping	Amazon.com Free shipping	Amazon.com 30-day

Paid Search Text Ads

Sponsored

Amazon.com
<https://www.amazon.com/shop/deals>




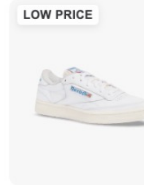

Reebok Shoes At Amazon

As Fast as Same-Day with Prime — Discover the perfect blend of clothing, shoes & jewelry to elevate your fashion game. Enjoy...

★★★★★ Rating for amazon.com: 4.5 - 4,688 reviews - Order accuracy: 95-100%

Free Product Listings

Popular products :

				
LOW PRICE		LOW PRICE	LOW PRICE	
Reebok Men's Club C 85 Vintage	Reebok Men's Work N Cushion 4.0...	Reebok Men's Club C 85	Men's Reebok Club C 85 Vintage	Adult Reebok Classic Leather
\$50.00 Usually \$90	\$45.00	\$50.00 Usually \$75	\$59.31 Usually \$75	\$49.97
Amazon.com, 4+ Free delivery 4.4 ★★★★★ (779)	Amazon.com 4.5 ★★★★★ (758)	Amazon.com, 3+ Free delivery 4.6 ★★★★★ (2.6K)	Amazon.com, 6+ Free delivery 4.6 ★★★★★ (4.1K)	Amazon.com, 5+ Free delivery 4.5 ★★★★★ (78)

Free Search Snippet

Amazon.com
<https://www.amazon.com/Reebok-Shoes?k=Reebok+...>

Reebok Shoes

Reebok · Women's Club C 85 Vintage Walking Shoe · Reebok · Unisex Club C 85 Sneaker · Reebok · Women's Princess Sneaker · Reebok · Men's Zig Dynamica 2.0 ...

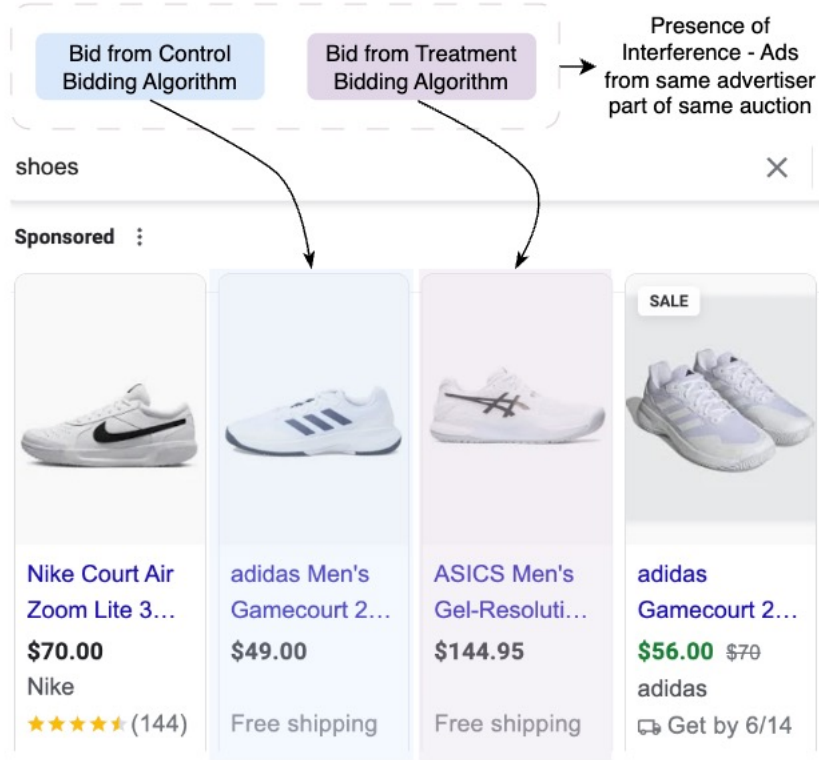
4.5 ★ store rating (4.7K) · \$28 to \$99 · 30-day returns



Components of a Search Engine Results Page (SERP)

Motivation

An Application in Search Marketing



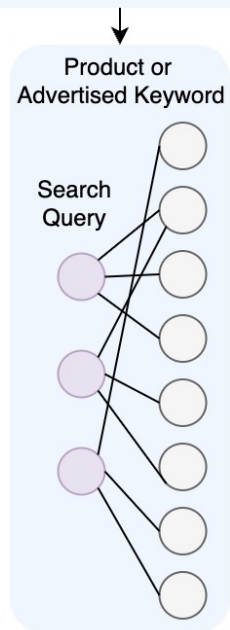
Shopping Ads Carousel

If these 2 products have same bids from different bidders (i.e. control and treatment) then SUTVA is violated.

Experiment Cluster Randomized Control Trial Design

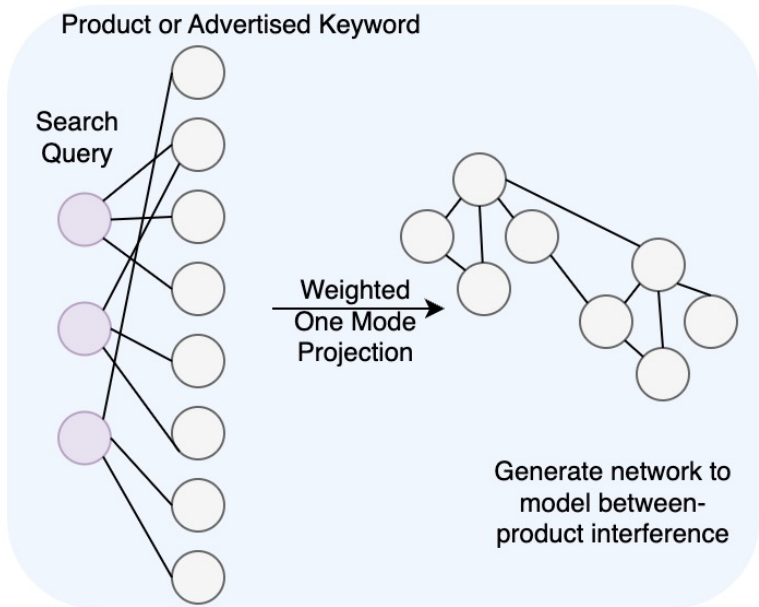


Search Query, Advertised Product/Keyword, Impressions, Clicks



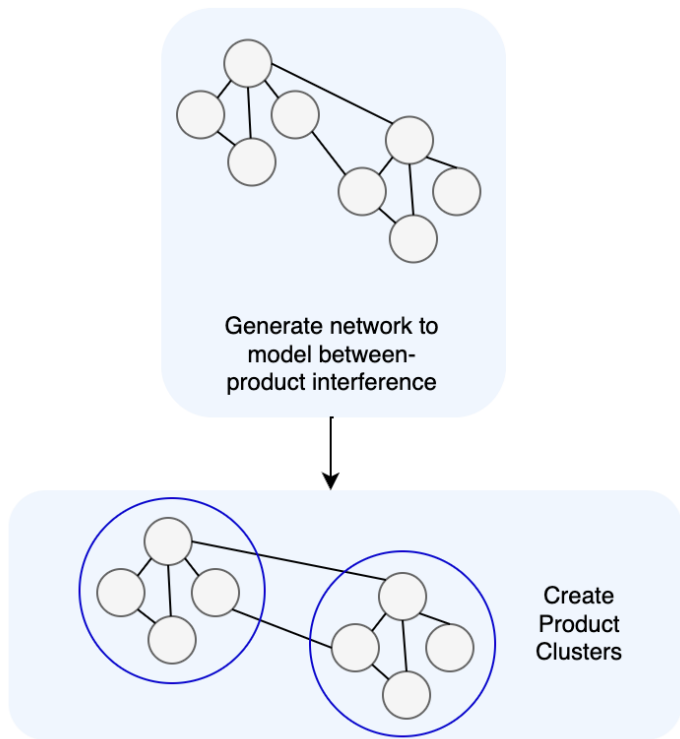
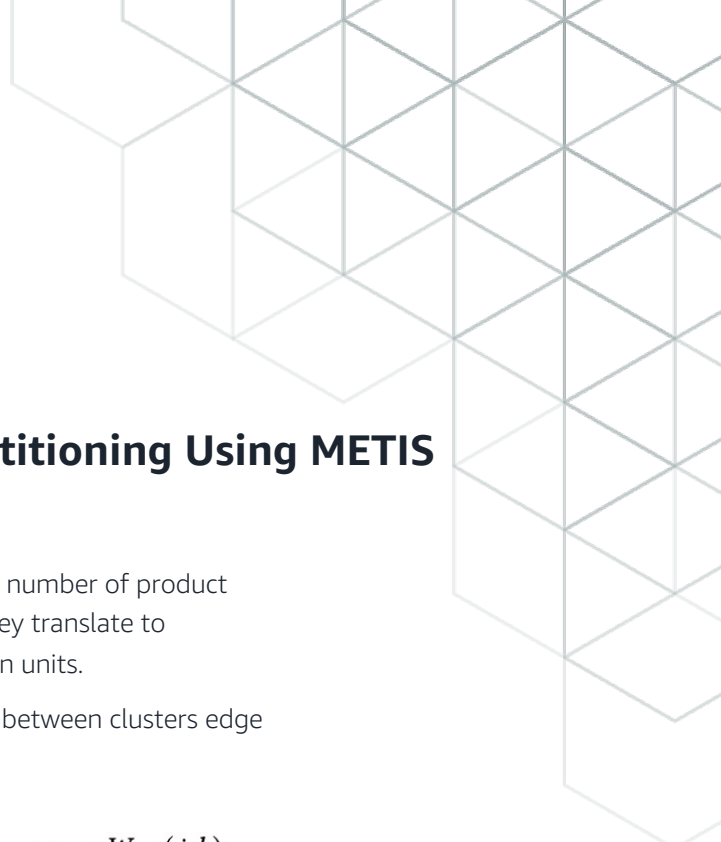
1. Modelling Network Interference

- Notion of Interference
- Edge Weight



2. Unipartite Projection

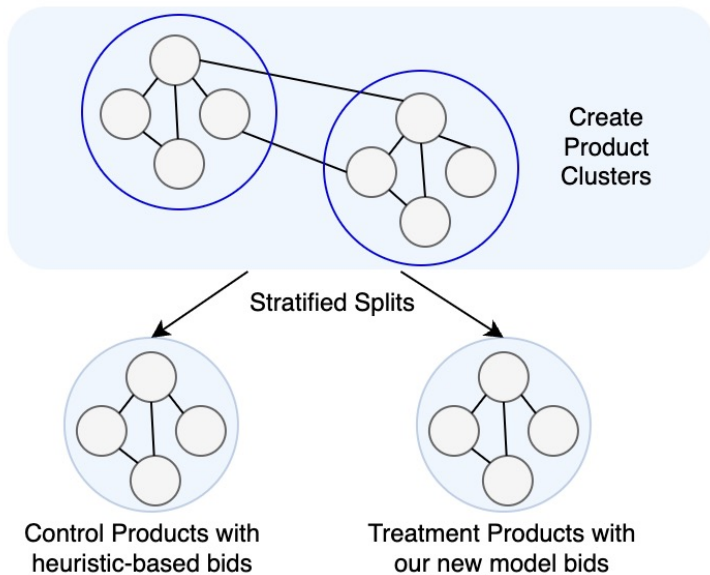
$$W_{\text{uni}}(a, b) = \sum_{i=1}^n \frac{1}{\log_e(f_{sq_i})} \frac{\min(W_{bi}(sq_i, a), W_{bi}(sq_i, b))}{\max(W_{bi}(sq_i, a), W_{bi}(sq_i, b))} I[sq_i, a, b] \quad (1)$$



3. Graph Partitioning Using METIS

- Balance between
 - Maximize the number of product clusters as they translate to randomization units.
 - Minimize the between clusters edge weights.

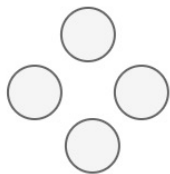
$$L = \frac{\sum_{i=1}^k \sum_{j \in C_i, k \notin C_i} W_{\text{uni}}(j, k)}{\sum_{j, k} W_{\text{uni}}(j, k)}$$



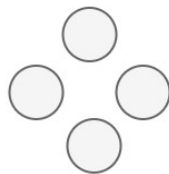
4. Stratified Randomization

- Stratum based on traffic volume, revenue and profit.
- Within each stratum, clusters are randomly assigned to C and T.

Product Randomization

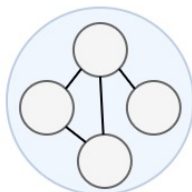


Control Products with heuristic-based bids

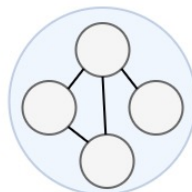


Treatment Products with our new model bids

Product Cluster Randomization



Control Products with heuristic-based bids



Treatment Products with our new model bids

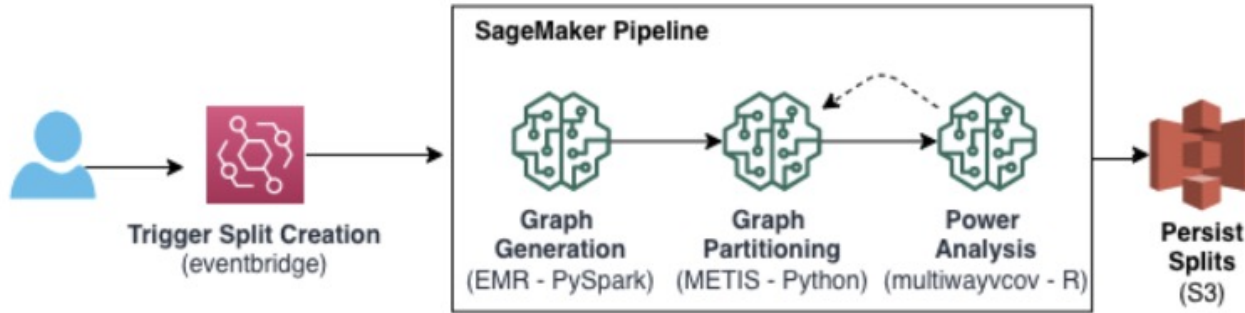
Results

- 200M+ nodes, 400M+ edges
- We settled at 36% leakage; 10,000 clusters; 0.6 clustering coefficient
- Product Split (44% lift) vs Product-Cluster Split (24% lift)

Architecture Search Marketing Lab

Search Marketing Lab

- Define series of interconnected processing steps where each step:
 - Can be provided its own docker image that has our code in preferred language.
 - Can have its own compute environment.



Next Steps



AI Overview

Learn more

According to runner's world, Reebok shoes are designed for everyday training and are very affordable, making them a good choice for beginners. Reebok shoes also have plush interiors and shock absorbing midsoles that support your feet well. ^

Runner's World

The 6 Best Reebok Running Shoes of 2024 - Runner's World

Aug 22, 2023 — Yes. Reebok shoes are designed for everyday training and...

Amazon.com

Upto 50% to 80% OFF on Reebok Shoes Online For Men - Amazon

If you are looking to buy shoes that you can wear everyday, Reebok is...

Here are some Reebok shoes: v



Reebok Women's Club C Double

\$85.00

Reebok, + more

Free shipping

4.6 ★★★★★ (648)



Reebok Women's Club C Double Black

\$85.00

Reebok, + more

Free shipping

4.8 ★★★★★ (1.5K)



Reebok Women's Club C Extra Shoes

\$78.30

Amazon.com, + more

Free shipping

4.6 ★★★★★ (158)

Next Steps

- Censored data.
- Magnitude of Spillover.
- Substitution Aware Bidding.



Thank You.