

AD-MAD: Integrated System for Automated Development and Optimization of Online Advertising Campaigns

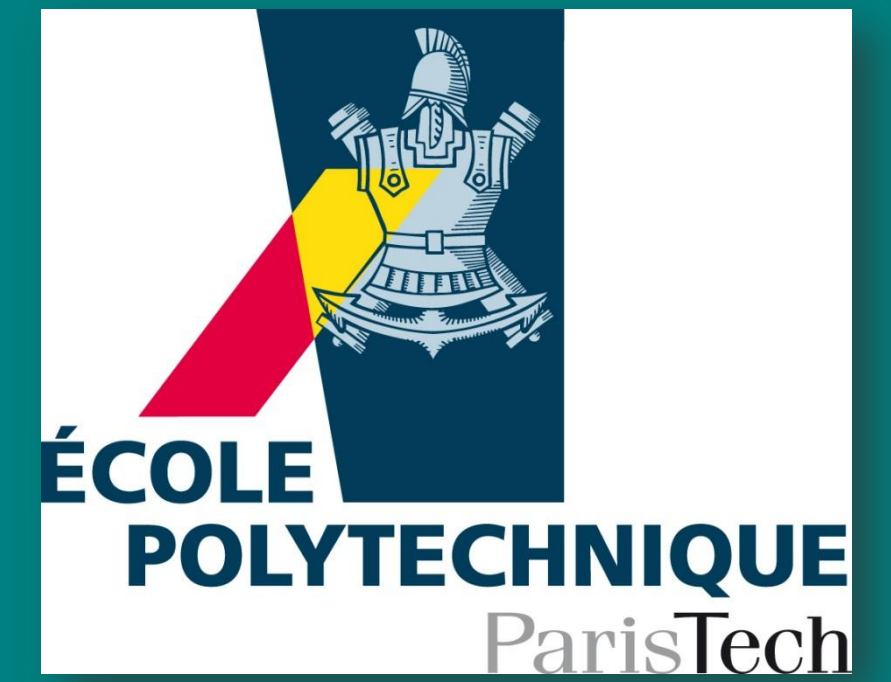


S. Thomaidou^{1,2}, K. Leymonis^{1,2}, K. Liakopoulos¹, M. Vazirgiannis^{1,2,3}

¹Athens University of Economics and Business

²LIX, Ecole Polytechnique

³Telecom - Paris Tech, Ecole Polytechnique



Motivation

- Preparation of large scale **online advertising campaigns** becomes a complex task for websites with **online catalogs** or **catalog aggregators**
- Efficient **Keyword Selection** for each landing page
- Bidding Strategy for **Monetary Profit** or **Traffic**
- Need for **Automation & Optimization**

Budget Optimization

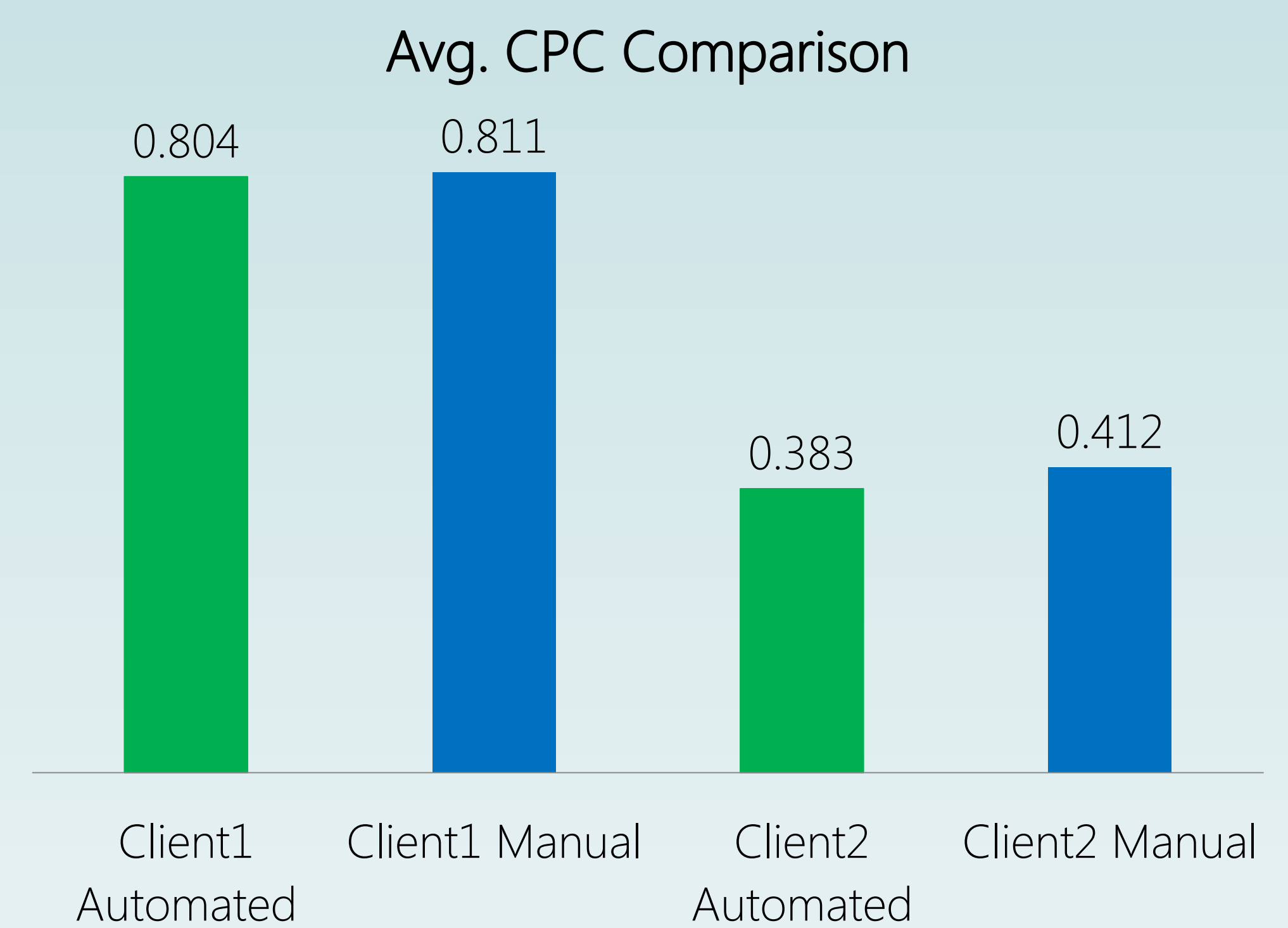
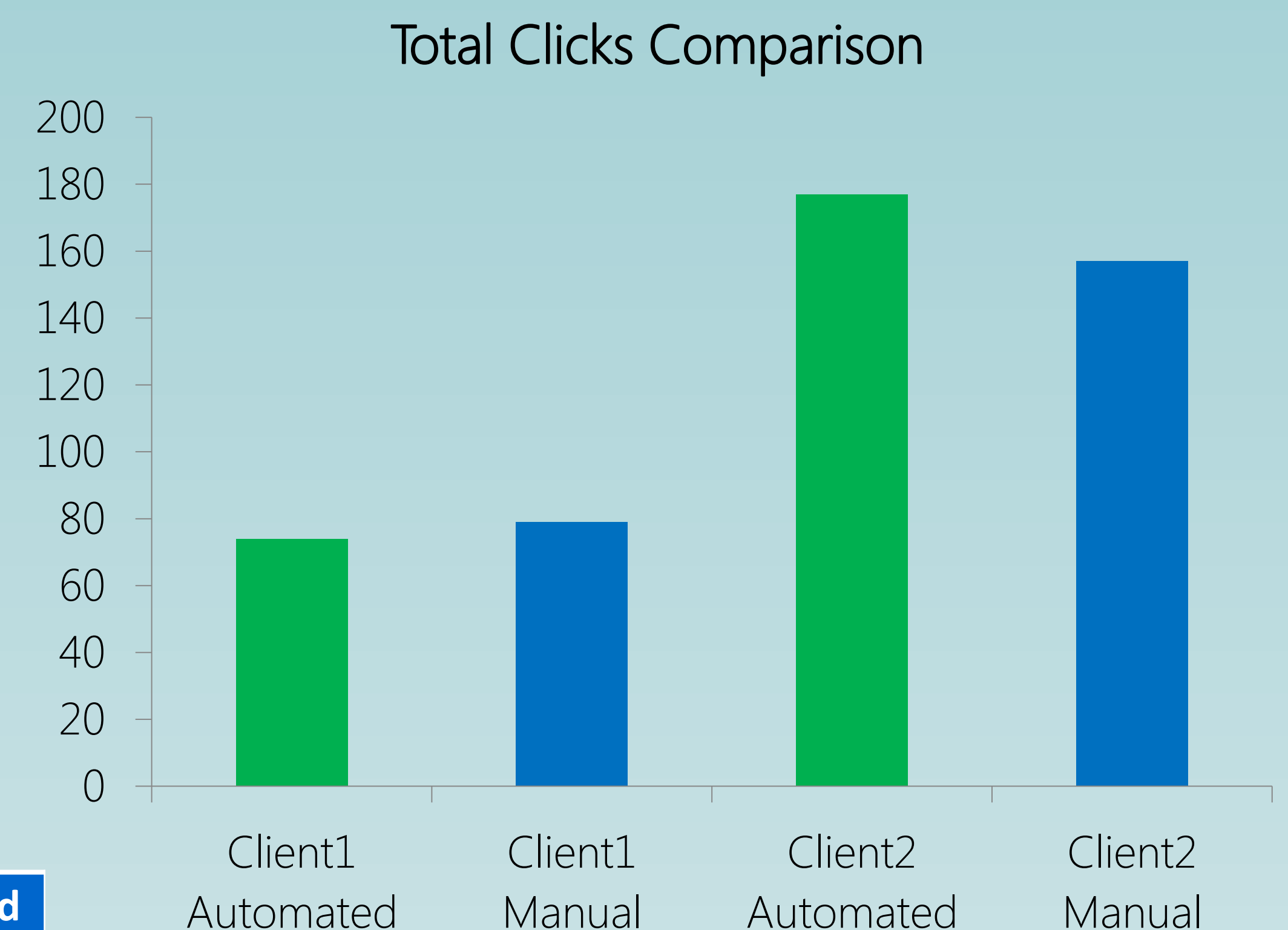
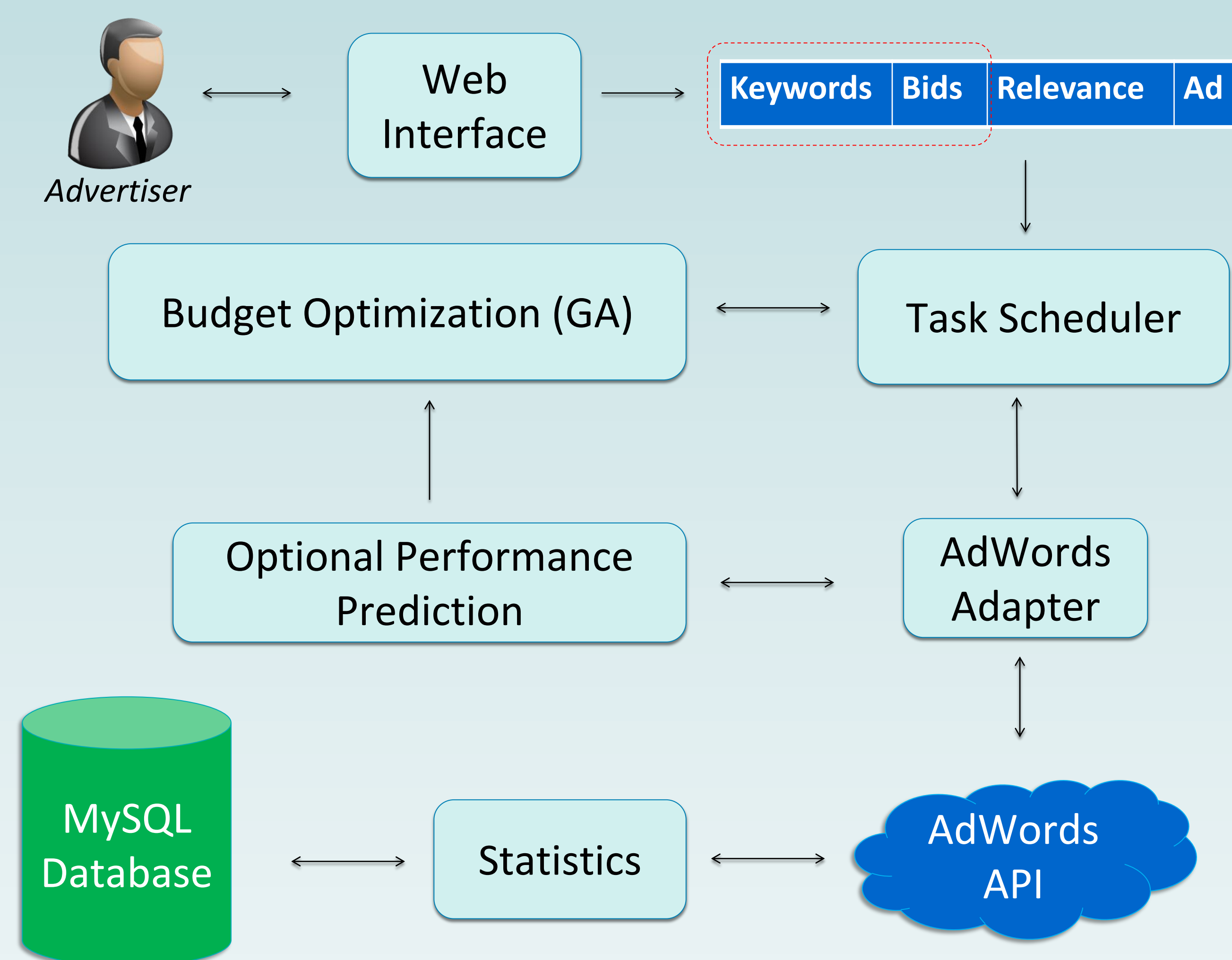
- Multiple-choice knapsack problem formulation
 - Candidate items: Options of keyword – bid pairs (k, b) along with their profit v and cost w
 - Objective: Maximize $\sum v(k, b)$ subject to $\sum w(k, b) \leq B$
- Genetic Algorithm: Chromosome \equiv Set of items
 - Selects fittest chromosome
- Performance Prediction: Multiple Linear Regression
 - y : Impressions of the next auction
 - x_1 : Competition, x_2 : Global Monthly Searches, x_3 : Clicks
 - $y = \theta_0 + \theta_1 x_1 + \theta_2 x_2 + \theta_3 x_3$

Real-world Parallel Competing Campaigns

- Empirical Evaluation of our system using **Google AdWords Campaigns** for two websites (clients)
- For each client: we maintain a manual and an automated campaign for a total period of 17 days

Our Approach

- Automate** all the lifecycle of an AdWords campaign
- Bidding Strategy : Formulate the process as a **Multiple Choice Knapsack Problem** – Solve it with **Genetic Algorithm**
- Exploit **external information** from the ad auctions using **Performance Prediction**
- Experiment in real-world campaign data: **Google AdWords** and its API



Input Settings

- Targeting Google Search Network, opting-out the same time from Display Network group due to very low CTR values ($< 0.5\%$) \rightarrow low Quality Scores and increased recommended bids for good ad slots
- User inserts:
 - Main Website of the promoted product or service
 - Temporal length of the campaign
 - Budget (B)
 - Target (helpful for the Ad Creative & call-to-action phrases)
 - Goal: a. No Optimization, b. Traffic Optimization, c. Profit Optimization

Crawler: URL Aggregator of the Main Website. Retrieves active links and discovers candidate landing pages.

Keyword Generation: a. Extracts trigrams, bigrams, and unigrams for bidding along with a normalized relevance score. b. Suggests extra terms using search engine snippets.

Ad Creative Generation: Generates ad-text. Summarizes each landing page, produces a typical sentence for an ad, while it appends a call-to-action phrase.

Demos

- <http://adomaton.com/>
- <http://grammads.com/>

References

- K. Liakopoulos, S. Thomaidou, M. Vazirgiannis. The Adomaton Prototype: Automated Online Advertising Campaign Monitoring and Optimization. Eighth Ad Auctions Workshop, EC'12.
- S. Thomaidou, M. Vazirgiannis. Multiword Keyword Recommendation System for Online Advertising. ASOAM '11



The research of S. Thomaidou is co-financed by the European Union (ESF) and Greek national funds via Program Education and Lifelong Learning of the NSRF - Program: Heracleitus II.

Prof. M. Vazirgiannis is partially supported by the DIGITEO Chair grant LEVETONE in France.

