

Brain Pad-Case Study

Applying optimization technology to the automated search advertising optimization tool L2Mixer™

Analytics and Optimization

In this era of the advanced information society, corporations have a large amount of data, i.e. "Big Data". BrainPad Inc. extracts the necessary knowledge from this "Big Data", and offers solutions that utilize this knowledge for numerous operations. We offer solutions that utilize optimization technology, such as the automatic search advertising optimization tool L2MixerASP service, and other innovations developed in response to our clients' requests. Also, we have developed a comprehensive recommendation tool for the Rtoaster recommendation engine (kernel methods were used), offering comprehensive marketing solutions.

Analytics have become a critical issue, because the key to success in business is to make correct and efficient decisions by determining which data is most important and what the best methods are to analyze it. Today, with the very wide use of the internet, analysis of online data has to be included. On many search engines and other sites, search advertising is frequently employed. Based on a search keyword, the most closely related advertisements are displayed on the site. For each of those search advertisements you are casually viewing, behind the scenes a flood of data analysis has instantaneously been performed. For advertisers, it is essential to maximize the ROI (cost-benefit performance) of search advertising. Optimization technology can be utilized as a core technology for efficient search advertising systems.

Automatic search advertising optimization tool L2Mixer™

BrainPad Inc. employs Gurobi Optimizer as a mathematical optimization solver for its automatic search advertising optimization tool with intelligent features, L2Mixer™. In the largest cases, several hundred thousand to several million keywords are placed, but L2Mixer™ has found that automatic optimization of search advertising can greatly streamline the work and planning of placing advertisements.

Automatic placement by optimization calculations that utilize the API of Yahoo and Google dramatically diminishes operational work of advertisers' search advertising placements. L2Mixer's auto bidding feature quickly calculates the best placement plan that maximizes the target value (numbers of conversion etc.) after meeting constraint conditions such as daily budget and CPC (Cost Per Click), and automatically submits bids for each medium (optimize d bidding). For example, in the case of a target setting such as "maximize the number of clicks with the limitation of a CPC below 200 yen" with 3 keywords, the number of click increases as indicated in figure 2, improving CPC. So, the best combination for bidding is

found instantaneously from an enormous quantity and combination of patterns, automating keyword placement plans for search advertising, which previously had to be handled by a person. L2Mixer™ can make operations more efficient and stable, without relying on the skill level of the person involved.

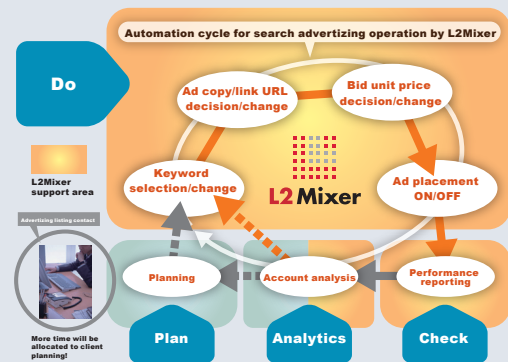


Fig. 1 Automation cycle for search advertising operation by L2Mixer™

Gurobi Optimizer Exclusive Distributor in Japan

October Sky Co., Ltd.

Kotobukicho KY Building
1-8-1 Kotobukicho Fuchu-shi Tokyo 183-0056
Tel 042-207-3020 (Main)
Fax 042-207-3022
URL : <http://www.octobersky.jp>
e-mail : info@octobersky.jp

Gurobi Optimizer Sales Outside of Japan

Gurobi Optimization LLC.

9450 SW Gemini Dr #90729
Beaverton, Oregon 97008-7105
USA Tel +1 713-871-9341 (Main)
Fax +1 713-960-0793
URL : <http://www.gurobi.com>
e-mail : info@gurobi.com

BrainPad Inc. Web site: <http://www.brainpad.co.jp>

L2Mixer product Web site: <http://www.l2mixer.jp>

Brain Pad-Case Study

Applying optimization technology to the automated search advertising optimization tool L2Mixer™

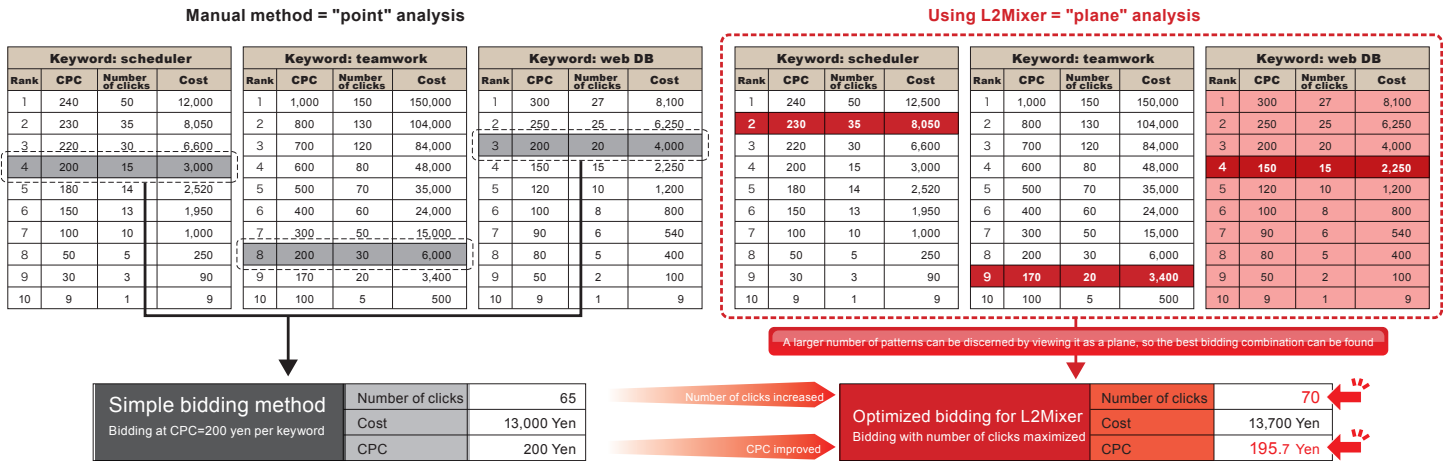


Fig. 2 L2Mixer's optimized bidding

Employing Gurobi Optimizer

With the 1984 publication of the interior point method by Mr. N. Karmarkar of AT&T Bell Labs, optimization technology reached a turning point. In 1988, the International Symposium on Mathematical Programming (ISMP) was held in Tokyo, and many prominent researchers in optimization technology visited Japan. Since then, mathematical optimization programs have continued to make astonishing progress.

I've specialized in mathematics since my college years, and I've had an eye on the Gurobi Optimizer ever since it was introduced in Japan. For L2Mixer™, we were using other commercial mathematical optimization solutions until we adopted Gurobi Optimizer. The previous program couldn't process SOS restrictions (restrictions that can handle linear functions) at high speed, and it took over 1 hour to perform optimization calculations for millions of keywords.

In 2010, Gurobi Optimizer became available in Japan and we conducted an evaluation test. The optimization calculation was done within 10 minutes. Also, since L2Mixer™ is offered with ASP service, the included mathematical optimization solver is cheaper, and in order to offer better service a flexible licensing structure was essential. Gurobi Optimizer was a satisfactory solver both in price and licensing structure. With Gurobi Optimizer, investments in hardware no longer greatly affect investments in software. Because of this, and with consideration for operational streamlining for L2Mixer™ end-users, we decided to switch to Gurobi Optimizer. BrainPad Inc. will continue to enhance its various

services through a combination of analytics and optimization technology.

Gurobi Optimizer can solve MILP (mixed integer programming) problems faster than other programs, and even more speed is expected. Specifically, algorithms for the advancement of hardware multi-core technology and the continuous adoption of newest technology are expected. Analysis of Big Data is becoming more and more important today, and it's inevitable that customers continue to demand us to analyze those vast amounts of data and immediately offer the best answer.

With Gurobi Optimizer offering such high performance, I'm certain that optimization technology will continue to be useful in many business situations.



BrainPad Inc.
Chief Scientific Technology Officer (CSO)
Yasutoshi Yajima, DME