

# Research examines cutting edge of online advertising

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SF State scientists are leading the search for valuable knowledge about Internet advertising, an industry that is barely a decade old but now worth \$12 billion in the U.S. alone.

Özgür Özlük and Susan Cholette, both associate professors of decision sciences, recently published an article in the *Journal of Optimization Theory and Applications* that found advertisers' widely accepted practice of setting a strict daily [budget](#) could be greatly harming their sales.

"A lot of the research that has been out there has been focused on the search engine company's point of view. We're focused on the advertisers," said Cholette.

The two researchers studied pay-per-click [advertising](#) on Google, which claims 72 percent of the U.S. search engine market. Each time someone clicks on a link sponsored by an advertiser, Google charges the advertiser for the service of directing visitors to their site. But advertisers often set a maximum daily budget so that their ad is taken down after the budget limit is reached.

"At first, the simple idea was banner ads. They took what is in print media and just translated it to the Internet," said Özlük, who published one of the first academic studies on the topic in 2005. "Now, it's a real time auction each time somebody makes a search."

Using a series of complex equations, the two researchers considered a

theoretical shadow price -- the point at which advertisers would benefit from going over budget. After examining the trade-off between profit and risk, they recommended advertisers experiment with varying their budget and the keywords they sponsor. Mixing multiple keywords and using more specific words and phrases can also help, by reducing ambiguity and competition.

"A lot of advertisers are very cautious," Cholette said. "But they should embrace risk, because unlike traditional advertising, they have the ability to see the effectiveness of their ads in real time."

Özlük said companies might also be using the wrong metrics to measure their success. Internet advertisers' foremost goal is to increase sales. But in a dynamic Internet environment, measuring how clicks translate to sales is difficult. Brand recognition may be a more important payoff in the long term.

"Instead of maximizing revenue, companies should try to minimize costs and make sure they get a certain number of impressions to ensure brand recognition," said Özlük.

**More information:**

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Provided by San Francisco State University

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