

How to Enhance Online Hotel Ad Effectiveness Based on Real-World Data: Mobile Eye-Tracking and Machine Learning Tell

Wen Xie, University of Houston

Ming Chen, UNC Charlotte

Zhu Han, University of Houston

ABSTRACT

Marketing researchers have adopted eye-tracking technology to extract information on consumers' eye-fixation and attention in order to fully understand their shopping behaviors under online and offline settings. One application is to examine the patterns of eye-fixation from different consumers on a certain website and to provide insights on the effectiveness of online advertisements. However, because of the complexity of data analysis and computational burden, it is quite challenging for researchers to track consumers' visual focus and investigate eye-fixation patterns in a dynamical way. In this paper, we try to solve the aforementioned challenges by utilizing the powerful computing tool of machine learning (ML) methods to investigate consumers' areas of interest (AOIs) on a hotel booking website using mobile eye-tracking technology. From the eye-tracking data collected from a field experiment, by applying the ML YOLO approach, we find that the mean average precision (mAP) is 92.35% which indicates high accuracy to identify AOIs. Furthermore, the findings show that different AOIs receive different levels of attention reflected on different eye-fixation counts and there exists consumer heterogeneity in the attention distribution amongst different AOIs. From the managerial perspective, this paper suggests that web designers can provide the online hotel ad layout according to personal preferences and make customized recommendations spontaneously based on a consumer's eye-fixation patterns and demographics. The insights provided from this research can help evaluate the effectiveness of the online hotel advertisements layout on the booking rate.

Keywords: *mobile eye-tracking, machine learning, online hotel ad layout, advertising effectiveness*

Description: *Combining machine learning and mobile eye-tracking technology, this research investigates the differences of consumers' eye-fixation counts with respect to different Areas of Interest of online hotel ads and then proposes suggestions for enhancing the advertising effectiveness.*

Introduction

The total spending on travel and tourism is reaching \$1.1 trillion in 2018 (the U.S. Travel Association), which accounts for 5% of the U.S. Gross Domestic Product of the United States. Most of these expenditures happen on Online Travel Agency (OTA) websites due to its convenience. \$7.5 Billion of the total spending went to hotel and lodging. The common OTAs include Expedia, Hotels, TripAdvisor, Priceline, Booking, Orbitz, etc. The online advertisement on each OTA has its unique attributes and layout. Obviously, each

OTA pays much attention to the way of enhancing the effectiveness of its online advertisements because that's a key to increase the OTA's competitiveness and booking rate.

Many researchers have investigated the importance of different attributes (e.g., price, text, and image) of online tourism ads (Law and Hsu 2006; Pan, Zhang, and Law 2013). In addition, some of the previous studies try to link the perceived importance of different attributes with consumer's demographic information such as age, gender, and education

For further information contact: Wen Xie, University of Houston (wxie5@uh.edu).
