Ad viewability prediction on web

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ABSTRACT:

Nowadays, advertisement plays the major role in all industry. By giving attractive advertisement will attract many customers. Advertisers' were charged for each view of that webpage. For each advertisement, the advertisers' will invest a large amount of money but they don't get the gain for their invested money. Because some advertisement was placed at the bottom of the webpage. The webpage viewer will not scroll the webpage. So they will not get gain for that advertisement. In our paper, we will find the scroll depth so that we will predict if the webpage viewer will see the advertisement or not and the advertisers will be charged according to the view of advertisement not the view of a webpage. The algorithm will forecast the upcoming values of advertisement click using a dynamic neural network.

Keywords **— Viewability Prediction, Computational Advertising, User Behavior.**

I. INTRODUCTION

Online display advertising is the most popular forms of advertising. The click rate will be depending on the special weekdays or national or international celebration days. The important indicators of web pages are number of visitors, average visiting time, bounce rate, number of new visitors and conversion rate. These things are helpful for managers and administrators to decide, functionality, related to the page rank, content and usability of a webpage.

The demand for forecasting is the conversions, most probable number of visitors, conversions, or new customers appears in the situations, when to sell advertising service on a particular webpage.

However, more than half of the impressions are actually not viewed by the user because they don't scroll down the page enough to view the ads. So there is a loss for an advertiser.

In this paper , we have used dynamic neural network based algorithm for prediction of advertisement clicks and the scroll depth of the webpage to predict if the user sees the advertisement or not.

II. RELATED WORK

The paper "Probabilistic models for Ad viewability prediction on the web" presented by Chong Wang et.al in 2016[1] propose that how likely a user will scroll down to a target scroll depth of a webpage. Specifically, the prediction personalized to each user and web pages. The proposed approach is a supervised learning

technique. The inputs of the training module are historical user logs that contain the context of page views. The output is our viewability prediction model. Display ads can create an emotional experience that gets users excited about a brand and builds trust. However, users do not typically click this type of ads, rendering the traditional form of pricing structure based on clicks or conversion ineffective. The paper "Application of Dynamic Neural Network for Prediction of Advertisement Clicks" presented by Vita Jaseviciute et.al in the year 2016[2] proposed number of clicks on a particular advertisement link on a particular web page. The dynamic neural network based algorithm proposed in this paper for forecasting the upcoming values of the advertisement clicks gives extra advantages in forecasting precision comparing to LPC based predictors. It has an accuracy result based on the Bounce rate, average session time and the average page load time. The paper "Predicting Clicks: CTR Estimation of Advertisements using Logistic Regression Classifier" presented by Rohit Kumar et.al in 2015[3] propose a Logistic Regression for the effective framework to representing, constructing conditions and vulnerabilities among variables. Logistic Regression is a type of probabilistic statistical classification model which predicts a binary response from a binary predictor, depend upon one or more predictor variables. Advertisements have the most raised to clicked are chosen using the supervised machine learning calculation. The paper "Ad slot Mining for Online Display Ads" presented by Kazuki Taniguchi et.al in 2015[4] propose a macro approach for mining new ad slots for every ad by recommending right ad slots to the ad. The proposed method does not need any user information and is pre-calculated offline, even when there are not any impressions of the ad on the target ad slots. It applies matrix factorization techniques to ad-ad slot performance history
Matrix for calculating the predicted performance of the target ad slots. The paper "Predicting Pre-click Quality for Native Advertisements" presented by Ke Zhou, Miriam Redi, Andy Haines and Mounia Lalmas in the year 2016[5] proposed to design a learning framework to predict the pre-click quality of native ads and we look for detecting offensive native ads, showing that, to quantify ad quality, ad offensive user feedback rates are more reliable than the commonly using click-through rate metrics. We conduct a crowd-sourcing study to find which criteria drive for each user preferences in native advertising. We translate these criteria into a set of ad quality features that extract from the ad image, text and advertiser, and then use them to train a model able to find offensive ads. The paper "Adaptive Sparseness for Supervised Learning" presented by Mario A.T. Figueiredo in 2003[6]. He proposes a Bayesian approach to supervised learning, which use to lead the sparse solutions in this irrelevant limits are automatically set exactly to zero. In contrast, this approach does not involve any hyperparameters to be adjusted or estimated. This is modified by the adoption of a Jeffreys' no informative hyperprior performance. The design also uses low power and low-cost. The paper "A Logistic Regression Approach to Ad Click Prediction" presented by Gouthami Kondakindi et.al in 2015[7] propose an empirical study of using different machine learning techniques to predict whether an ad will be clicked or not. We do click prediction on a binary scale - 1 for click and 0 for no click. We use clicks data from Avazu provided as a part of Waggle competition as our data set. We do feature choice to remove features that do not help improve classifier accuracy. We inspect data manually and use feature selection ability of Vowpal Wabbit for this purpose. The supervision algorithm with many classifications gives us an accurate clicking result. The paper "Ad Click Prediction: a View from the Trenches" presented by H. Brendan McMahan et.al in 2013[8] proposed to the algorithm used in this paper is supervision

learning techniques based on FTRL- proximal learning algorithm and the usage of the per coordinate learning rates. The paper "Sequential Click Prediction for Sponsored Search with Recurrent Neural Networks" presented by Taifeng Wang et.al in 2015[9] Click prediction is one of the fundamental problems in sponsored search. Most of the existing studies took an advantage of machine learning approaches to predict ad click for each event of ad view independently. To evaluations on the click-through the logs from a commercial search engine prove that our approach can significantly improve sequence-independent approaches and the click prediction accuracy.

III. PROPOSED METHODOLOGY

Our problem is to estimate that how a user will scroll down to a target webpage and the prediction should personalize to individual users and WebPages. In our paper, the proposed approach is a supervised learning technique and the inputs of the training module are historical user logs which give the information about the context of page views. The output is our viewability prediction model. Display ads can create an emotional experience that gets users excited about a brand and builds trust. However, users do not typically click this type of ads, rendering the traditional form of pricing structure based on clicks or conversion to be ineffective. The overall architecture of the system is:

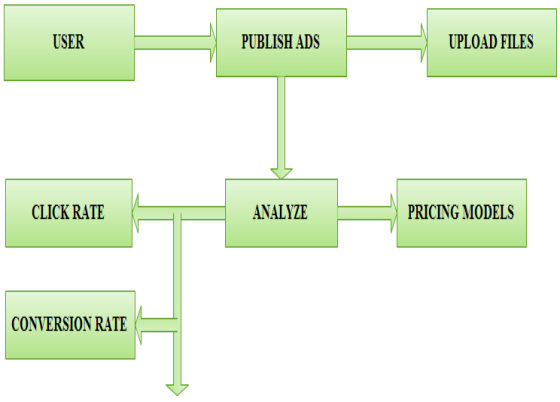

Fig 3.1: Overall system architecture

IV. RESULTS AND DISCUSSION

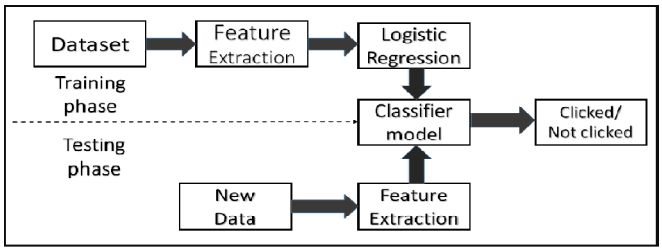

Fig 4.1: System Model for CTR Prediction Classifier

Click-through rate estimation plays a vital role in selection of an advertisement. In this paper, we proposed a novel approach to CTR prediction task by applying supervised machine learning algorithm and using the concept of Logistic Regression. This paper describes results obtained from experiments on the advertisement data set. The features described in the paper are easily implantable on the web scale. We show that our model can differentiate between regions which have null click rates from those which might get more clicks depending on their place and depth. One of the greatest future prospects is in making the CTR estimation dependent on the users' query. In this paper, we have predicted the query-independent CTR of an advertisement.

Knowing what the query is may give more information on the expected CTR for each ad. The same model presented here could be employed with an added query-dependent features such as number of words present in the query, Further research may join testing complex features, number of words appearing in the ad text or landing page, describing query-ad similarity and user behavior, similarity between the query and the bid term, leading to development of highly personalized advertising. The techniques that become more precise with the increase in training set size is an interesting challenge. Another issue at hand is automatic monitoring having many comments features.

V. CONCLUSION AND FUTURE ENHANCEMENT

This paper presented the first to study the problem of predicting the viewability chance for a given scroll depth and a user/webpage pair. Solving this issue can benefit online advertisers to allow them to invest more effectively in advertising and can benefit publishers to increase their revenue? The algorithm used in this paper that can predict the viewability for any given scroll depth where an ad is placed. The experimental results show models have substantially better prediction performance than the comparative systems. The algorithm can better adapt to the shift of user interests and webpage attractiveness and has less memory consumption.

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