Modeling Users For Online Advertising

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Abstract

Online advertising can target users at a fine level of granularity. To do this effectively, we need models to represent users and their behavior. In this thesis, we study several problems related to models of online users.

– We implement a user-profile driven ad crawler system and empirically investigate the relationship between user profiles and ads shown to them. We observe user profiles play a greater role in display ads than in video ads.

– We design a neural network model `app2vec` to vectorize mobile apps, by looking at how users use these apps. We analyze the learned app vectors qualitatively and quantitatively and use these vectors to design efficient algorithms for app-install advertising, such as ad conversion prediction and ad selection.

– Finally, we design a lookalike audience extension system. Advertisers provide a list of past converters as “seed users”, and our system determines users similar to the seed. Rather than assuming linear separability of lookalike and non-lookalike users like in prior work, we propose a campaign specific nearest-neighbor based approach. Our system works efficiently on billions of users and effectively improves ad campaign conversion rate in practice at Yahoo!.

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