

## Homework 5

*Handed Out: November 1, 2019**Due: November 15, 2019 11:59 pm*

## 1 General Instructions

- This assignment is due at 11:59 PM on the due date. We will be using Gradescope for collecting this assignment. The homework **MUST** be submitted in pdf format on gradescope Contact TAs if you face technical difficulties in submitting the assignment. We shall **NOT** accept any late submission!
- Please make sure to appropriately map/assign the pages of your submitted pdf to each sub-question listed in the homework outline. Handwritten answers are not acceptable. Name your pdf file as YourNetid-HW5.pdf
- For all questions, you need to explain the logic of your answer/result for every subpart. A result/answer without any explanation will not receive any points.
- It is OK to discuss with your classmates and your TAs regarding the methods, but it is **NOT** OK to work together or share code. Plagiarism is an academic violation to copy, to include text from other sources, including online sources, without proper citation. To get a better idea of what constitutes plagiarism, consult the CS Honor code (<http://cs.illinois.edu/academics/honor-code>) on academic integrity violations, including examples, and recommended penalties. There is a zero tolerance policy on academic integrity violations; Any student found to be violating this code will be subject to disciplinary action.
- Please use Piazza if you have questions about the homework. Also feel free to send TAs emails and come to office hours.
- Please find the link to the Liu and Tang paper pdf below <sup>1</sup>.

## 2 Question 1 (2 points)

What is homophily? Why is this important in behavioral targeting that uses social information?

## 3 Question 2 (6 points)

Please answer the following questions based on the Liu and Tang paper [1] which was discussed in class. Each part carries 2 points.

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<sup>1</sup><http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.309.5609&rep=rep1&type=pdf>

1. The paper talks about a trade-off between an individual's profile and social information in behavioral targeting. Identify a case when using social information is likely to yield poorer results. Explain why.
2. Identify a case when using social information is going to be very valuable. Explain why.
3. Refer to Figure 2 from the paper (which is also given in class slide 30). Let's look at the ad clicks for the category Hispanic targeting in this figure. Explain why the likelihood of clicking on a display ad is so high if at least one friend has clicked on an ad in this category compared to the case when no friends have clicked on any ad.

## 4 Question 3 (2 points)

If you are an advertiser and you develop a behavioral profile for an user, should you focus on their long term or short term interests? How will you make decisions on what you do? Explain with reasons.

## 5 Question 4 - Advertising models (10 points)

This is a 3 part question. The questions are based on the discussions that was carried out in-class about advertising model on 10/25 and 11/01. The first question carries 4 points, while the others carry 3 points each.

1. This question is based on the advertising model of Stack Exchange. Their advertising model is as follows—It has high bar for entry, you need to have at least 10000 USD to spend. There are no auctions. The advertising is based on contract. There is no real-time bidding. Discuss and identify two positive and two negative aspects of this advertising model compared to real time bidding.
2. The second question is based on the precise micro-targeting practices of consumers that happens during behavioral targeting and computational advertising in general. Advertisers micro-target consumers at fine grained level. However, should we consider such micro-targeting as predatory or unfair for more vulnerable consumers like the elderly or children? In other words, is micro-targeting in the context of vulnerable population a positive or a negative development? Discuss.
3. Based on your discussion of micro-targeting scenario in the previous part, now consider this case—the display of political ads in a platform like Facebook is based on micro-targeting. Similar to Twitter, should Facebook ban all political ads on its platform? Discuss.

## References

- [1] Kun Liu and Lei Tang. “Large-scale behavioral targeting with a social twist”. In: *Proceedings of the 20th ACM international conference on Information and knowledge management*. ACM. 2011, pp. 1815–1824.