Electronic Commmerce
CAS CS 591 – Fall 2015
The Course Project

1   Project Guidelines

What am I looking for in a strong project?

- First, I am hoping that there will be an elegant aspect of electronic commerce that you are able to investigate in your work. In the first part of the class, we have largely focused on measurement and modeling papers that begin from a compelling hypothesis and investigate the question through datasets. While I think this is an excellent model for a class project, it is not the only appropriate one. Other appropriate directions could involve design and analysis of a market mechanism, or starting a preliminary investigation of an open question, such as a theoretical question, in an e-commerce paper.

- Second, I am expecting that there will be a rigorous quantitative evaluation of your approach, regardless of your methodology. This could take the form of an in-depth analysis, or an experimental evaluation of a new method, or quantitative modeling of a new mechanism. What we are shooting for is a rigorously designed evaluation section that both cleanly and elegantly builds the case for the aspect or approach you elected to study. I am not expecting you to conduct your research in isolation – you should plan on frequent discussions with either myself or other faculty advisor to make sure your project is on track.

2   Deliverables

- Project proposal: by October 29, I ask you to submit a two-page summary (minimum) of your proposed project activities. This includes an overview of the area you intend to study and the research direction you intend to pursue, along with a basic description of your methodology or approach. Include a working bibliography (mandatory) of pieces of related work that you intend to draw from when conducting your study.

- We will reserve the last class of the semester for a poster session of the class projects. Possibly we will coordinate with other graduate classes on the exact timing, but I will expect you to produce a poster (and accompanying 5-10 minute commentary) highlighting your results. We will talk about guidelines for a good poster presentation as the date approaches.

- During finals week, a conference-style writeup of your results will be due. I don't care a great deal about the length of the writeup (anywhere from 6-10 pages in double-columned format may be appropriate); the quality of the writeup is far more important. We will talk about guidelines for a good paper as the end of the semester approaches. I will also give you a LaTeX template which I will ask you to use for your paper later in the course.

3 Project Ideas

Before I enumerate a few project pointers (none of which are guaranteed to bear fruit), let me first start with a word of caution. As with any piece of research, if you are not intensely interested in getting to the bottom of a problem, then you are not likely to make much progress. Therefore, **do not** choose a topic just because it has been suggested to you — pick a topic you care about deeply. (If there is no such topic, that's a good indication that a career in e-commerce research is probably not for you). Also, use the resources that are available to you, i.e. talk with me and with other faculty members about possible project directions that you are considering, and continue to consult with us throughout the semester. Finally, picking a good project can be very challenging, so get started thinking about topics and reading papers early.

Some ideas are listed below, mostly drawn from papers that appeared in recent Proceedings of the ACM Symposium on Economics and Computation (until recently, ACM Symposium on Electronic Commerce) (see class website for links), but it is likely that the best projects will follow a line of the students' own initiative, and not one of those mentioned below.

Multi-Level Marketing: One interesting direction is multi-level marketing, where people at the top of the pyramid get compensated for recruiting others into (typically) a sales effort. A similar model was adopted by the winning MIT-based team that competed in DARPA's Network (Red Balloon) Challenge a few years back. See: Moshe Babaioff, Shahar Dobzinski, Sigal Oren and Aviv Zohar, "On Bitcoin and Red Balloons" and Fabio Drucker and Lisa Fleischer, "Simple Sybil-Proof Mechanisms for Multi-Level Marketing", or find your own starting point.

Online Diffusion: Many recent directions in electronic commerce related to social networks, and word-of-mouth marketing. One line is to reason about how information diffuses and propagates through these networks. There is a great deal of work here. Some recent papers include Sharad Goel, Duncan Watts, Daniel Goldstein, "The Structure of Online Diffusion Networks"; Flavio Chierichetti, Jon Kleinberg and Alessandro Panconesi, "How to Schedule a Cascade in an Arbitrary Graph"; and Eytan Bakshy and Dean Eckles, "Effects of Social Cues and Tie Strength in Social Advertising: Evidence from Field Experiments".

Voter Models: A different social network direction relates to how individuals' choices influence other individuals. A widely studied model is the so-called voter model, dating back to the early '90s. Investigating this theoretical model in the context of consumer choice could make for a nice project bridging between theory and practice. One starting point is: Durrett et al. "Graph fission in an evolving voter model". Proc. Nat'l. Acad. Sci. 109 (2012).

Online Advertising: Later in the class, we will be coming back to this topic in more depth, but there is a very rich ecosystem here. Just google "online advertising ecosystem kawaja" to see what I'm talking about. Many aspects of this field are open to investigation, for example: Mohammad Mahdian, Arpita Ghosh, Preston McAfee and Sergei Vassilvitskii, "To match or not to match: Economics of cookie matching in online advertising".

Many other examples, firms, and problem domains are in scope. This is just a small, but representative sample to give you some ideas.