Mathematical Models in Marketing

Spring 2016

Fridays, 10:45 am – 2:00 pm

Instructor: Rajeev Kohli

Overview

The purpose of the course is to provide students an introduction to mathematical models in marketing. The course covers a mix of standard topics (e.g., preference models, segmentation, marketing mix) and more recent topics (e.g., social media, web search, advertising auctions). Students can expect to gain an understanding of how mathematical methods are used to study marketing problems. The emphasis of the course is on developing the skills to evaluate and undertake research using mathematical methods.

Classes will be a combination of lectures and discussions of assigned articles. You are expected to contribute to class discussions, actively listen and think critically about the concepts and issues discussed in the course. Reading the required papers for each class is the best way to prepare for class participation. You are expected to prepare a short critique (2-3 pages) of selected articles and lead the class discussion on selected papers. Both your critique and class discussion should focus on providing:

1. A succinct summary of the objective and contribution of the research.

2. A careful critique of the research, including a discussion of the paper’s major strengths and weaknesses (spend most of the time here).

3. Future research issues in the problem area.

Grading

30% homework; 40% research proposal; 30% class preparation and participation.

You should identify a topic for the research proposal by the third week of class, so that you have sufficient time to acquire the relevant background and develop your
analysis. The paper should develop a model so that the potential contribution can be assessed. But the entire paper need not be completed. For example, you do not have to collect data, or write it as a paper ready for submission to a journal. High quality work is expected. Using canned computer programs to analyze a data set is not appropriate for the course.

Readings

Readings for the sessions are given below. All the major journals in marketing are available online through Columbia University libraries. A pdf copy of the Easley and Kleinberg book *Networks, Crowds, and Markets: Reasoning About a Highly Connected World* is available from Jon Kleinberg’s website.

Sessions 1 and 2. Models of compensatory and non-compensatory preferences.


**Sessions 3. Segmentation, Targeting, Personalization.**


Session 5. Diffusion, information and cascades


2. Easley, D. and J. Kleinberg (2010), *Networks, Crowds, and Markets: Reasoning About a Highly Connected World,* Chapters 16 (information cascades), 19 (cascading behavior in networks) and 22 (markets and information).

Sessions 6. Networks and social media.


2. Easley, D. and J. Kleinberg (2010), Networks, Crowds, and Markets: Reasoning About a Highly Connected World, Chapters 2 (graph theory and social networks), 3 (strong and weak ties), 4 (networks in their surrounding contexts) and 20 (the small worlds phenomenon).


Session 7 and 8. Pricing and promotions.


5. Easley, D. and J. Kleinberg (2010), Networks, Crowds, and Markets: Reasoning About a Highly Connected World, Chapter 9 (auctions), Chapter 14 (link analysis and web search) and Chapter 15 (sponsored search markets).


Sessions 9 and 10. Advertising and distribution channels.


Session 11. Retailing and salesforce.


Session 12. Presentations.