Prerequisites: None.

Time: Fall 2015, Mondays and Wednesdays at 4-5:20pm, MRF229

Instructors: Professors Kristina Lerman (lerman@isi.edu)

Course Syllabus

Course Introduction

The phenomenal growth of social media has transformed the social, political, and technological landscapes. Social media sparked a revolution by putting knowledge production and communication tools in the hands of the masses. Today on sites such as Twitter, Facebook, and YouTube, large numbers of people publish rich content, annotate it with descriptive metadata, communicate and respond to others. Social media has transformed how we create and consume knowledge, respond to disasters, monitor environment, manage resources, and interact with the world and one another. What’s more, by exposing individual and collective behavior, social media delivers large quantities of social data for analysis, offering new research opportunities and new computational challenges.

This course will examine topics in social data analysis, including influence and centrality in social media, information diffusion on networks, topic modeling and sentiment analysis, identifying social bots, and predicting behavior. We will see how AI, network analysis, and statistical methods can be used to study these topics. While there are no prerequisites, I expect students to be proficient in programming, algorithms and data structures, and have taken college level or above courses in linear algebra and statistics. AI and machine learning coursework is a plus.

Course Requirements

There are no required textbooks. The reading material is based on recently published technical papers available via the ACM/IEEE/Springer digital libraries. All USC students have automatic access to these digital archives.

Grading

The class will run as a seminar course with student participation (10%), homework (30% of the grade) and weekly quizzes (30% of the grade). An integral part of the course is the class project (30% of the grade) using real-world social media data.

Statement for Students with Disabilities

Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to TA) as early in the semester as possible. DSP is located in STU 301
and is open 8:30 a.m.–5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776.

**Statement on Academic Integrity**
USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one’s own academic work from misuse by others as well as to avoid using another’s work as one’s own. All students are expected to understand and abide by these principles. Scampus, the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A: http://www.usc.edu/dept/publications/SCAMPUS/gov/. Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at: http://www.usc.edu/student-affairs/SJACS/.

**Emergency Preparedness/Course Continuity in a Crisis**
In case of a declared emergency if travel to campus is not feasible, USC executive leadership will announce an electronic way for instructors to teach students in their residence halls or homes using a combination of Blackboard, teleconferencing, and other technologies.
Topics and Readings

- **Week 1: August 24**
  - Topic: Course Introduction

- **Week 1: August 26**
  - Topic: Phenomenology of social media
  - Readings:

- **Week 2: August 31**
  - Topic: Topic Analysis Basics
  - Readings:

- **Week 2: September 2**
  - Topic: Sentiment Analysis
  - Readings:

- **Homework #1 assigned**

- **Week 3: September 7**
  - Labor Day
• **Week 3: September 9**
  - **Topic:** Network Analysis Basics
  - **Readings:**
    2. D. Austin, “It’s a small world afterall”
  - **Quiz 1**

• **Week 4: September 14**
  - **Topic:** Influence and Centrality in Social Networks
  - **Readings:**
    1. Freeman, L. 1979 “Centrality in Social Networks: Conceptual Clarification”, *Social Networks* 1, No. 3.

• **Week 4: September 16**
  - **Topic:** Influence and Centrality in Social Networks
  - **Readings:**
    1. E Bakshy, J. M. Hofman, W. A. Mason, D. J. Watts. 2011 “Everyone's an influencer: quantifying influence on Twitter” In *Proceedings of Int. Conf. on Web Search and Data Mining (WSDM)*
  - **Quiz 2**

• **Week 5: September 21**
  - **Topic:** Influence and Centrality in Social Networks
  - **Readings:**
  - **Homework #1 due**

• **Week 5: September 23**
  - **Topic:** Dynamic processes on networks
• **Readings:**

• **Quiz 3**

• **Homework #2 assigned**

• **Week 6: September 28**
  • **Topic: Social ties and network structure**
  • **Readings:**

• **Week 6: September 30**
  • **Topic: Social ties and link prediction**
  • **Readings:**

• **Quiz 4**

• **Week 7: October 5**
  • **Topic: Information diffusion**
  • **Readings:**
- **Week 7: October 7**
  - **Topic:** Information diffusion
  - **Readings:**
    1. Ver Steeg, G., Lerman, K. and Ghosh, R. 2011 “What stops social epidemics?”, in *Proc. 5th International AAAI Conference on Weblogs and Social Media (ICWSM)*
  - **Project proposals due**
  - **Quiz 5**

- **Week 8: October 12**
  - **Topic:** Social Spam and Malicious Behavior
  - **Readings:**
  - **Homework #2 due**

- **Week 8: October 14**
  - **Topic:** Social Spam and Malicious Behavior
  - **Readings:**
  - **Quiz 6**

- **Week 9: October 19**
  - **Topic:** Geospatial social data mining
  - **Readings:**

- **Week 9: October 21**
  - **Topic: Geospatial social data mining**
  - **Readings:**
    - [optional] Scellato, S., Noulas, A., Lambiotte, R., Mascolo, C. 2011 “Socio-spatial Properties of Online Location-based Social Networks” In Proceedings of the 5th International AAAI Conference on Weblogs and Social Media (ICWSM)
  - **Quiz 7**

- **Week 10: October 26**
  - **Topic: Privacy in a Networked World**
  - **Readings:**
    2. M. De Choudhury, S. Counts, E. Horvitz, A. Hoff. *Characterizing and Predicting Postpartum Depression from Facebook Data*, *ICWSM 2014*

- **Week 10: October 28**
  - **Topic: Privacy in a Networked World**
  - **Readings:**
  - **Quiz 8**
• **Week 11: November 2**
  - **Topic: Predicting the future with social media**
  - **Readings:**
    2. Asur, S and Huberman, B (2010) “Predicting the future with social media”, *Web Intelligence and Intelligent Agent Technology (WI-IAT)*

• **Week 11: November 4**
  - **Topic: Predicting the future with social media**
  - **Readings:**
  - **Project mid-term report due**
  - **Quiz 9**

• **Week 12: November 9**
  - **Topic: Emotional contagion**
  - **Readings:**

• **Week 12: November 11**
• **Topic:** Friendship paradox and detection of contagions
  
  **Readings:**

• **Quiz 10**

• **Week 13: November 16**
  
  **Topic:** Crowdsourcing with Mechanical Turk
  
  **Readings:**

• **Week 13: November 18**
  
  **Topic:** Social tagging and folksonomies
  
  **Readings**

• **Quiz 11**

• **Week 14: November 23**
  
  **Topic:** Free topic or class presentations, depending on enrollment
  
  **Readings:**

• **Week 14: November 25**
  
  **Thanksgiving Holiday**

• **Week 15: November 30**
  
  4. Class presentations

• **Week 15: December 2**
  
  1. Class presentations