MMC6936 Computational Methods for Media Research
Spring 2025

Professor: Jieun Shin
Department of Media Production, Management, Technology
Email: jieun.shin@ufl.edu
Office: Weimer 1098
Office Hours: Fridays 12:30 p.m.-2:30 p.m. and by appointment.

Course Description

Computational social science is an exciting, emerging field offering various research tools. This course is an introductory and project-oriented course with an emphasis on data collection and computational methods. In this course, students will learn how to conduct social research using digital trace data (broadly defined as data collected through digital means) and computational methods (including but not limited to text analysis and social network analysis). Throughout the semester, students will practice translating their ideas into empirical research. Each week, students will have the opportunity to try their hands at analyzing data from a wide range of data sources. The goal is to help students identify datasets and apply proper methods to analyze their own data. We will mainly use the R software environment to collect, clean, and analyze data. Previous experience with R is not assumed.

Course Goals

Upon successful completion of this course, students will be able to

1. Collect digital trace data from the webs
2. Become familiar with computational methods and tools to analyze the data
3. Construct and execute basic programs in R
4. Use techniques to effectively visualize information
5. Understand the advantages and limitations of digital data

Course Schedule

Time	Module	Assignment
Week 1 (Jan. 15)	Module 0. Introduction [Required] • Kesari, A., Kim, J. Y., Shah, S., Brown, T., Ventura, T., & Law, T. (2023). Training Computational Social Science Ph.D. Students for Academic and Non-Academic Careers. PS: Political Science & Politics, 1-6. • Radford, J., & Lazer, D. (2019). Big Data for Sociological Research. The Wiley Blackwell Companion to Sociology, 417-443. • Salganik, M. J. (2019). "1.2 Welcome to the digital age",Links to an external site. Bit by bit: Social research in the digital age. Princeton University Press. [Recommended] • Hofman et al. (2021). Integrating explanation and prediction in computational social science. Actions Nature, 595(7866), 181-188. • Lazer, D. M., Pentland, A., Watts, D. J., Aral, S., Athey, S., Contractor, N., ... & Nelson, A. (2020). Computational social science: Obstacles and opportunities, Science, 369(6507), 1060-1062.	
Week 2 (Jan. 25)	Module 1. R programming • Barton Poulson (2019): Learning R (LinkedIn Course) • Google R course (2019): Data Analysis with R programming (Coursera)Links to an external site. - Choose an option to audit for free content • Archives: An introduction to R.	Lab1
Week 3 (Jan. 29)	Module 2. Volume data [Required] • Salganik, M. J. (2019). Chapter 2 (Observing Behavior). Links to an external site.Bit by bit: Social research in the digital age. Princeton University Press. • Arendt, F., & Fawzi, N. (2019). Googling for Trump: Investigating online information seeking during the 2016	Lab 2

	US presidential election. Information, Communication & Society, 22(13), 1945-1955. • Kim, C., & Yang, S. U. (2017). Like, comment, and share on Facebook: How each behavior differs from the other. Public relations review, 43(2), 441-449. [Recommended] • Radford, J. & Joseph, K. (2020). Theory in, theory out: the uses of social theory in machine learning for social scienceLinks to an external site. Frontier in Big Data. • Jungherr, A., Schoen, H., Posegga, O., & Jürgens, P. (2017). Digital trace data in the study of public opinion: An indicator of attention toward politics rather than political support. Social Science Computer Review, 35(3), 336-356.	
Week 4 (Feb. 5)	Module 3. Data collection [Required] • Acker, A., & Kreisberg, A. (2020). Social media data archives in an API-driven world. Archival Science, 20(2), 105-123. • Ohme, J., Araujo, T., Boeschoten, L., Freelon, D., Ram, N., Reeves, B. B., & Robinson, T. N. (2024). Digital trace data collection for social media effects research: APIs, data donation, and (screen) tracking. Communication Methods and Measures, 18(2), 124-141. • Bruns, A. (2021). After the 'APIcalypse': Social media platforms and their fight against critical scholarly research. Disinformation and Data Lockdown on Social Platforms, 14-36. • [Recommended] • Edelmann, A., Wolff, T., Montagne, D., & Bail, C. A. (2020). Computational social science and sociology. Annual review of sociology, 46(1), 61-81.	Lab 3
Week 5 (Feb. 12)	Module 4. Text data (part 1) [Required] • Humphreys, A., & Wang, R. (2017). Automated text analysis for consumer research, 44(6), 1274-1306.	Lab 4

	• Welbers, K., Van Atteveldt, W., & Benoit, K. (2017). Text analysis in R. Communication Methods and Measures, 11(4), 245-265. • Berger, J., Humphreys, A., Ludwig, S., Moe, W. W., Netzer, O., & Schweidel, D. A. (2020). Uniting the tribes: Using text for marketing insight. Journal of Marketing, 84(1), 1-25 [Recommended] • DiMaggio, Paul. (2015). Adapting computational text analysis to social science (and vice versa). Big Data & Society 2(2): 1-5. • Tausczik, Y. R., & Pennebaker, J. W. (2010). The psychological meaning of words: LIWC and computerized text analysis methods. Journal of language and social psychology, 29(1), 24-54.	
Week 6 (Feb. 19)	Module 5. Text data (part 2) [Required] • Taboada, M. (2016). Sentiment Analysis: An overview from Linguistics. Annual Review of Linguistics, 2, 325-347. • Puschmann, C., & Powell, A. (2018). Turning words into consumer preferences: How sentiment analysis is framed in research and the news media. Social Media+ Society, 4(3) [Recommended] • Valenzuela, S., Piña, M., & Ramírez, J. (2017). Behavioral effects of framing on social media users: How conflict, economic, human interest, and morality frames drive news sharing. Journal of Communication, 67(5), 803-826 • Soroka, S., Young, L., & Balmas, M. (2015). Bad news or mad news? Sentiment scoring of negativity, fear, and anger in news content. The ANNALS of the American Academy of Political and Social Science, 659(1), 108-121.	Lab 5

Week 7 (Feb. 26)	Module 6. Topic Modeling [Required] • Blei, D. (2012). Topic modeling and digital humanitiesLinks to an external site.. Journal of Digital Humanities, 2(1). • Ying, L., Montgomery, J. M., & Stewart, B. M. (2022). Topics, concepts, and measurement: A crowdsourced procedure for validating topics as measures. Political Analysis, 30(4), 570-589. • Hannigan, T. R., Haans, R. F., Vakili, K., Tchalian, H., Glaser, V. L., Wang, M. S., ... & Jennings, P. D. (2019). Topic modeling in management research: Rendering new theory from textual data. Academy of Management Annals, 13(2), 586-632. [Recommended] • Jacobi, C., Van Atteveldt, W., & Welbers, K. (2016). Quantitative analysis of large amounts of journalistic texts using topic modelling. Digital Journalism, 4(1), 89-106. • Song, H., Eberl, J. M., & Eisele, O. (2020). Less fragmented than we thought? Toward clarification of a subdisciplinary linkage in communication science, 2010–2019. Journal of Communication, 70(3), 310-334.	Lab6
Week 8 (Mar. 5)	Module 7. Project Idea Pitch	
Week 9 (Mar. 12)	Module 8. Merging Dataset [Required] • Bit by Bit. Chapter 3. Asking questions. • Stier, S., Breuer, J., Siegers, P., & Thorson, K. (2020). Integrating survey data and digital trace data: Key issues in developing an emerging field. Social Science Computer Review, 28(5), 503-516. • Shin, J. (2020). How Do Partisans Consume News on Social Media? A Comparison of Self-Reports With	Lab7

	Digital Trace Measures Among Twitter Users. Social Media+ Society, 6(4), 2056305120981039. [Recommended] • Hopp, T., Ferrucci, P., & Vargo, C. J. (2020). Why do people share ideologically extreme, false, and misleading content on social media? A self-report and trace data–based analysis of countermedia content dissemination on Facebook and Twitter. Human Communication Research, 46(4), 357-384. • Araujo, T., Wonneberger, A., Neijens, P., & de Vreese, C. (2017). How much time do you spend online? Understanding and improving the accuracy of self-reported measures of internet use. Communication Methods and Measures, 11(3), 173-190. • Vraga, E. K., & Tully, M. (2020). Who is exposed to news? It depends on how you measure: Examining self-reported versus behavioral news exposure measures. Social Science Computer Review, 38(5), 550-566.	
Week 10 (Mar. 19)	Module 9. Network1 [Required] • Borgatti, S. P., Mehra, A., Brass, D. J., & Labianca, G. (2009). Network analysis in the social sciences. science, 323(5916), 892-895. • Scott, J. & Carrington, P.J. (2011). The Sage handbook of social network analysis. Chapter1: Introduction. [Recommended] • Valente, T. W. (2017). Putting the network in network interventions. Proceedings of the National Academy of Sciences, 114(36), 9500-9501. • Wired. (2020). The science that spans #MeToo, Memes, and Covid19.Links to an external site. • Hayat, T., Dimitrova, D., & Wellman, B. (2020). The differential impact of network connectedness and size on researchers' productivity and influence. Information, Communication & Society, 23(5), 701-718.	Lab 8

Week 11 (Mar. 26)	Module 10. Network 2 [Required] • Valente (2010): Chapter 8. Social Networks and Health: Models, Methods, and Applications. • Himelboim, I. (2017). Social network analysis (social media). The international encyclopedia of communication research methods, 1-15. [Recommended] • Howison, J., Wiggins, A., & Crowston, K. (2011). Validity issues in the use of social network analysis with digital trace data. Journal of the Association for Information Systems, 12(12), 2. • Teng, C. Y., Lin, Y. R., & Adamic, L. A. (2012, June). Recipe recommendation using ingredient networks. In Proceedings of the 4th Annual ACM Web Science Conference (pp. 298-307). • Shin, J., Jian, L., Driscoll, K., & Bar, F. (2017). Political rumoring on Twitter during the 2012 US presidential election: Rumor diffusion and correction. new media & society, 19(8), 1214-1235.	Lab 9
Week 12 (Apr. 2)	Module 11. Network 3 [Required] • Yeo, J. (2023). Interorganizational coordination for immigrant integration into local society. Journal of International Migration and Integration, 24(2), 567-585. • Shumate, M., & Palazzolo, E. T. (2010). Exponential random graph (p*) models as a method for social network analysis in communication research. Communication Methods and Measures, 4(4), 341-371 • Pilny, A., & Atouba, Y. (2018). Modeling valued organizational communication networks using exponential random graph models. Management Communication Quarterly, 32(2), 250-264. [Recommended] • Chen, H., Mehra, A., Tasselli, S., & Borgatti, S. P. (2022). Network dynamics and organizations: A review	Lab 10

	and research agenda. Journal of Management, 48(6), 1602-1660.	
Week 13 (Apr. 9)	Presentation	
Week 14 (Apr. 16)	Presentation	
Week 15 (Apr. 23)	Final project	Submit the paper

Required Text
All required readings are in the Course Shell. There are no required textbooks.

Note.
1. Please ask class-related questions in the question forum, not in the "comments" section of an assignment. This way, you can share the answers with other fellow students.
2. For technical issues with Canvas, please contact E-learning technical support 352-392-4357 (select option 2) or e-mail Learningsupport@ufl.edu. http://helpdesk.ufl.edu/

GRADING

Area	Percent of Grade
10 Labs (5 % each)	50%
Final presentation	10%
Final paper	40%
Total	100%

Grading scale
100-93 A; 92-90 A-; 89-87 B+; 86-84 B; 83-80 B-; 79-77 C+; 76-74 C; 73-70 C-; 69-67 D+; 66-64 D; 63-60 D-; 59 and below E

Labs (assignments)
All labs are due on the specified dates, usually by midnight on Sundays. Assignments turned in after the designated due date will receive a penalty (50 % of the available points within 24 hours after the due date). Assignments will not be accepted after 24 hours. Additionally, with respect to assignments and discussions, it is assumed that students will present them professionally. This means students will use proper grammar, word usage, spelling, and content organization. Academic honesty is expected on all assignments and discussions.

Task	Description
Lab1	This assignment is about importing data, reporting very basic descriptive statistics, and visualizing the relationships between variables.
Lab2	This assignment asks you to identify two continuous variables and report various statistical analysis
Lab3	This lab asks you to collect data of your own from CrowdTangle. For this homework, you don't need actually to conduct the analysis.
Lab4	This assignment asks you to find an article that used LIWC dictionaries and briefly explain what the study tried to measure
Lab5	Download a dataset from CrowdTangle based on your interest and then plot negative or positive sentiments over time.
Lab6	This lab asks you to run the topic modeling on the full dataset. It might take a few hours. Submit your plot showing the distribution of words for 15 topics.
Lab7	Import two different types of datasets into R: You need to report the brief descriptions of key variables requested and visualize the relationships
Lab8	Convert the edge list into an igraph object and answer the questions such as degree distributions.
Lab9	Plot networks based on their attributes and change the thickness of lines based on the edge values
Lab10	You are asked to run ERGM models on the network data and report whether the hypotheses are supported.

Final Presentation

Each student will present their project (in progress) for my feedback. Aim for a 30-minute PowerPoint presentation followed by a 10-minute Q&A session. The presentation should include the main research question and/or hypotheses, detailed methods, and major findings.

Final Project

As a part of the assigned work for this course, you are required to complete a research project of your own choosing on one or two methods covered in this course. The premise of the project must be closely related to some aspect of the course material but may explore an avenue that was left unaddressed in class. The final project report should be around 20 pages. Please submit your report by April 28.

The final report should include the following elements. Prepare your manuscript in APA style.

1. Literature review: This section should include the motivation and background of your project. Explain the context and why the problem matters. Why are they worth studying? What difference would knowing the answers make?

2. Methods: (A) Dataset- Describe the real, existing dataset that you used. (B) Data Analysis- Describe how you analyzed the data.

3. Results: Present and discuss your research results. Focus on the results that are most interesting, surprising, or important. Discuss the consequences or implications. Make sure to include tables, graphs, or figures.

4. Discussion: Interpret and describe the significance of your findings in light of what was already known about the research problem. Also, include the limitations of your approach.

OTHER CLASS POLICIES

Students with Special Needs: Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Course Evaluations: Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at https://evaluations.ufl.edu. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results/."

Academic Honesty: The University of Florida Honor Code applies to all activities associated with this class. UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/) specifies a number of behaviors that are in violation of this code and possible sanctions. You can review UF's academic honesty guidelines in detail at: https://www.dso.ufl.edu/sccr/seminars-modules/academic-integrity-module

Religious Observance: Religiously observant students wishing to be absent on holidays that require missing class should notify their professors in writing at the beginning of the semester and should discuss with them, in advance, acceptable ways of making up any work missed because of the absence.

Attendance: Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

Recording lectures: Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To "publish" means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code."

Campus Resources: Health and Wellness • U Matter, We Care: If you or a friend is in distress, please contact umatter@ufl.edu or 352 392-1575 so that a team member can reach out to the student. • Counseling and Wellness Center: counseling.ufl.edu/cwc, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies. • Sexual Assault Recovery Services (SARS): Student Health Care Center, 392-1161. • University Police Department at 392-1111 (or 9-1-1 for emergencies), or police.ufl. edu.