Matthew D. Sweitzer, Ph.D.

Phone: (815) 307-2647
Email: email@matthewsweitzer.com
Website: matthewsweitzer.com

Overview

My research focuses on using computational modeling methods to understand how social communication evolves, adapts, and informs over time and in complex systems. My coursework included training in statistical modeling, network analysis, and agent-based simulation methods. My research conducted during my graduate program at Ohio State University used these methods to investigate the dynamics of social network formation and how information and opinions are transmitted across network structures. More recently, my work at Sandia National Laboratories allowed me to develop new skills in machine learning methods, such as reinforcement learning and deep neural networks, as well as transformer models used to identify topics in a corpus of text data.

Professional Experience

Postdoctoral Appointee – Machine Intelligence and Visualization   July 30, 2021 – *present*
Sandia National Laboratories

Graduate Technical Intern – Machine Intelligence and Visualization   May 6, 2019 – July 30, 2021
Sandia National Laboratories

- Led the development and testing of a new network layout algorithm and analytic measure for testing communicative vibration theory and the prediction of social group stability; predictions tested with random forests and deep neural networks.
- Established a natural language processing pipeline incorporating multiple methods and visualized results into a live interactive analysis tool.
- Programmed agent-based models of disinformation flow and integrated both reinforcement learning agents and Bayesian hyperparameter optimization.
- Presented methods and results at project funding meetings, symposia, and scientific conferences.

Technical Skills

Programming Languages:
  Python, R, SQL, Bash, Groovy, Javascript, HTML, CSS, and LaTeX

Machine Learning and Data Analytic Methods:
  pytorch, scikitlearn, ERGM (and related; e.g. BTERGM) and CUG methods for network analysis and simulation, time-series analysis, and statistical modeling (e.g., regression, Bayes)

Simulation Software:
  Mesa (python package), Netlogo, Repast, N2A, and Anylogic

High-performance Computing Environments:
  Distributed batch processing using Slurm, Torque, Weights & Biases, and Amazon AWS

Other Software/Platforms:
  Shiny, oTree, Breadboard, Amazon Mechanical Turk, Matlab, and SPSS

Education

2015 – 2021	Ohio State University - Columbus
	Ph.D., Communication
	Dissertation:
	   "Selection homophily in dynamic political communication networks:
	      An interpersonal perspective."

2015 – 2019	Ohio State University - Columbus *M.A., Communication*
2008 – 2012	University of Missouri - Columbia *B.A., Communication, with honors*

Peer-Reviewed Publications

Bayer, J. B., **Sweitzer, M. D.**, Xiang, H., Mohan, S., & Meyers, E. (*in press*). Reimagining the personal network: The case of Path. *Social Media & Society.*

Coronel, J. C., Ott, J., Hubner, A., **Sweitzer, M. D.**, & Lerner, S. (*in press*). How are competitive framing environments transformed by person-to-person communication? An integrated social transmission, content analysis, and eye movement monitoring approach. *Communication Research.* doi:10.1177/0093650220903596

Shulman, H. C., **Sweitzer, M. D.**, Bullock, O. M., Coronel, J. C., Bond, R. M., & Poulsen, S. (*in press*). Predicting vote choice and election outcomes from ballot wording: The role of processing fluency in low information direct democracy elections. *Political Communication.* doi:10.1080/10584609.2022.2092920

Bond, R. M., & **Sweitzer, M. D.** (2022). Political homophily in a large-scale online communication network. *Communication Research, 49*(1), 93-115. doi:10.1177/0093650218813655

Coronel, J. C., Bullock, O. M., Shulman, H. C., **Sweitzer, M. D.**, Bond, R. M., & Poulsen, S. (2021). Eye movements predict large-scale voting decisions. *Psychological Science, 32*(6), 836-848. doi:10.1177/0956797621991142

Hubner, A., McKnight, J. M., **Sweitzer, M. D.**, & Bond, R. M. (2021). Down to a r/science: Integrating computational approaches to the study of credibility on Reddit. *Computational Communication Research, 3*(1), 91-115. doi:10.5117/CCR2021.1.004.HUBN

Coronel, J. C., Poulsen, S., & **Sweitzer, M. D.** (2020). Investigating the generation and spread of numerical misinformation: A combined eye movement monitoring and social transmission approach. *Human Communication Research, 46*(1), 25-54. doi:10.1093/hcr/hqz012

Holt, L. F., & **Sweitzer, M. D.** (2020). More than a black and white issue: Ethnic identity, social dominance orientation, and support for the Black Lives Matter movement. *Self and Identity, 19*(1), 16-31. doi:10.1080/15298868.2018.1524788

Melamed, D., Simpson, B., Harrell, A., Munn, C. W., Abernathy, J., & **Sweitzer, M. D.** (2020). Homophily and segregation in cooperative networks. *American Journal of Sociology, 125*(4), 1084-1127. doi:10.1086/708142

Sweitzer, M. D., & Shulman, H. C. (2018). The effects of metacognition in survey research: Experimental, cross-sectional, and content-analytic evidence. *Public Opinion Quarterly, 82*(4), 745-768. doi:10.1093/poq/nfy034

Coronel, J. C., & **Sweitzer, M. D.** (2018). Remembering political messages in dynamic information environments: Insights from eye movements. *Human Communication Research, 44*(4), 374-398. doi:10.1093/hcr/hqy006

Shulman, H. C., & **Sweitzer, M. D.** (2018). Advancing framing theory: Designing an equivalency frame to improve political information processing. *Human Communication Research, 44*(2), 155-175. doi:10.1093/hcr/hqx006

Shulman, H. C., & **Sweitzer, M. D.** (2018). Varying metacognition through public opinion questions: How language can affect political engagement. *Journal of Language and Social Psychology, 37*(2), 224-237. doi:10.1177/0261927X17707557

Published Proceedings

Gunda, T., & **Sweitzer, M. D.**. (*in press*). A natural language processing tool to support stakeholder engagements during a consent-based siting process. In *International High-Level Radioactive Waste Management Conference Proceedings.* La Grange Park, IL: American Nuclear Society.

Sanchez, D., Hackett, K., **Sweitzer, M. D.**, & Gunda, T.. (*in press*). Tag it: A natural language processing approach to enhancing delineation of public comments regarding the consent-based siting process. In *International High-Level Radioactive Waste Management Conference Proceedings.* La Grange Park, IL: American Nuclear Society.

Doyle, C., Naugle, A., Bernard, M., Lakkaraju, K., Kittinger, R., **Sweitzer, M. D.**, & Rothganger, F. (2020). Group formation theory at multiple scales. In R. Thomson, H. Bisgin, C. Dancy, A. Hyder, & M. Hussain (Eds.), *Social, Cultural, and Behavioral Modeling, SBP-BRiMS 2020* (pp. 171-181). Springer. doi:10.1007/978-3-030-61255-9_17

Berkemer, S. J., Cheong, S. L., Edgerton, J., Kogan, M., Laisshram, R., Pacheco, A. R., Shannon, A., **Sweitzer, M. D.**, & Wang, X. (2019). A study on public transport mobility flows in Singapore. In *2018 Complex Systems Summer School Proceedings*, (pp. 22). Santa Fe, NM: Santa Fe Institute. Retrieved from https://wiki.santafe.edu/images/9/9d/Proceedings_2018_v2.pdf

Gunda, T., **Sweitzer, M. D.**, Comer, K. T., Finn, C., Murillo-Sandoval, S., & Huff, J. (2019). Evolution of water narratives in local U.S. newspapers: A case study of Utah and Georgia. In *2018 Complex Systems Summer School Proceedings*, (pp. 9). Santa Fe, NM: Santa Fe Institute. Retrieved from https://wiki.santafe.edu/images/9/9d/Proceedings_2018_v2.pdf

Conference Presentations

International High-Level Radioactive Waste Management Conference 2022

A natural language processing tool to support stakeholder engagements during a consent-based siting process
Gunda, T., & **Sweitzer, M. D.**

Tag it: A natural language processing approach to enhancing delineation of public comments regarding the consent-based siting process
Sanchez, D., Hackett, K., **Sweitzer, M. D.**, & Gunda, T.

International Conference on Computational Social Science 2022

Using social simulations to train, test, and evaluate models for social prediction
Lakkaraju, K., Naugle, A., **Sweitzer, M. D.**, Wiryadinata, S., & Lehrer, G.

National Communication Association (NCA) Annual Convention 2020

Retracing the Path of personal network curation into social media
Bayer, J. B., **Sweitzer, M. D.**, Xiang, H., Mohan, S., & Myers, E.

International Conference on Social Computing, Behavioral-Cultural Modeling, & Prediction and Behavior Representation in Modeling and Simulation (SBP-BRiMS) 2020

Group formation theory at multiple scales
Doyle, C., Naugle, A., Bernard, M., Lakkaraju, K., Kittinger, R., **Sweitzer, M. D.**, & Rothganger, F.

International Conference on Complex Systems (ICCS) 2020

Communicative vibration: A graph-theoretic approach to group stability in an online social network
Sweitzer, M. D., Kittinger, R., Doyle, C., Naugle, A., Lakkaraju, K., Rothganger, F., & Verzi, S.

Association for Education in Journalism and Mass Communication (AEJMC) Annual Conference 2020

Transforming science information via person-to-person communication: Insights from experimental transmission chains and eye movements
Hubner, A., Coronel, J. C., Ott, J., **Sweitzer, M. D.**, & Lerner, S.

International Communication Association (ICA) Annual Convention 2020

Explaining how people vote on ballot initiatives with language difficulty and metacognition: Results from two ecological experiments
Shulman, H. C., **Sweitzer, M. D.**, Bullock, O. M., Coronel, J. C., Bond, R. M., & Poulsen, S.

Examining how stereotypes cue double-standards for Blacks and women in news
Holt, L. F., & **Sweitzer, M. D.**

Thinking reflectively or intuitively: How cognitive reflection moderates the effect of language complexity on abstention
Poulsen, S., Coronel, J. C., **Sweitzer, M. D.**, Bullock, O. M., Shulman, H. C., & Bond, R. M.

National Communication Association (NCA) Annual Convention 2019

Choice homophily in political discussion networks: Evidence from formal dynamic models of the selectivity function
Sweitzer, M. D.

Investigating how person-to-person communication transforms frames: A combined social transmission, content analysis, and eye movement monitoring approach **(top paper)**
Coronel, J. C., Ott, J., **Sweitzer, M. D.**, Hubner, A., & Lerner, S.

International Communication Association (ICA) Annual Convention 2019

Using eye movements to determine when laboratory findings can be generalized to naturalistic settings: Linguistic features of messages and real-world voting behaviors
Coronel, J. C., Bullock, O., Shulman, H. C., **Sweitzer, M. D.**, Bond, R. M., & Poulsen, S.

American Geophysical Union (AGU) Fall Meeting 2018

Evolution of water narratives in local U.S. newspapers
Witte, A., Hornberger, G. M., Gunda, T., Gilligan, J., & **Sweitzer, M. D.**

American Political Science Association (APSA) Annual Meeting 2018

Political homophily in a large-scale online communication network
Bond, R. M., & **Sweitzer, M. D.**

Association for Education in Journalism and Mass Communication (AEJMC) Annual Conference 2018

More than a black and white issue: Racialized identity and support for Black Lives Matter
Holt, L. F., & **Sweitzer, M. D.**

International Communication Association (ICA) Annual Convention 2018

Political homophily in a large-scale online communication network
Bond, R. M., & **Sweitzer, M. D.**

Down to a r/science: Integrating computational approaches to the study of communication on Reddit
Bond, R. M., Hubner, A., McKnight, J., & **Sweitzer, M. D.**

The generation and spread of numerical misinformation: A combined eye movement and social transmission approach
Coronel, J. C., Poulsen, S., & **Sweitzer, M. D.**

National Communication Association (NCA) Annual Convention 2017

Survey of surveys: A content analysis of the language complexity in public opinion polls
Sweitzer, M. D., & Shulman, H. C.

Political Networks (PolNet) Conference 2017

Partisan network selection: Theoretical and agent-based models of homophilic political discussion networks
Sweitzer, M. D., & Bond, R. M.

International Communication Association (ICA) Annual Convention 2017

Eye movements as measures of memory in communication research **(top paper)**
Coronel, J. C., & **Sweitzer, M. D.**

National Communication Association (NCA) Annual Convention 2016

Advancing framing theory: Using frames to improve public opinion via metacognition
Shulman, H. C., & **Sweitzer, M. D.**

American Political Science Association (APSA) Annual Meeting 2016

Television news content predicts political knowledge
Sweitzer, M. D., & Bond, R. M.

Using structural topic models to assess television news content
Bond, R. M., & **Sweitzer, M. D.**

Research Grants

Miller Research Award, $17,288.87 - Ohio State University, School of Communication 2018
Principal Investigator: Jason Coronel

Honors and Awards

Walter Lippmann Best Article of the Year Award 2021
for "Investigating the generation and spread of numerical misinformation"
American Political Science Association – Political Communication Section

Best Paper Award for "More than a black and white issue" 2020
The International Society for Self and Identity

Doris Gildea Morgan Scholarship Award (senior researcher award) 2019
The Ohio State University School of Communication

Top Paper Award for "Investigating how person-to-person communication transforms frames" 2019
    National Communication Association – Political Communication Division

Walter B. Emery Memorial Scholarship Award (junior researcher award) 2018
    The Ohio State University School of Communication

Top Paper Award for "Eye movements as measures of memory in communication research" 2017
    International Communication Association – Communication, Science, & Biology Division

Travel Award 2017
    International Communication Association – Communication, Science, & Biology Division

Graduate Fellowship Award 2017
    Political Networks Conference

Honors Society Member 2011–*present*
    Lambda Pi Eta National Communication Honors Society, Chi Beta chapter

Edward and Ellen Kniep Memorial Scholarship 2008 – 2012
    University of Missouri

John and Virginia Sutherland Scholarship 2008 – 2012
    University of Missouri

Service

International Communication Association - Political Communication Division
    Invited Reviewer (Autumn 2017, 2018, 2019, 2020)

International Communication Association - Computational Methods Group
    Invited Reviewer (Autumn 2020)

National Communication Association - Political Communication Division
    Invited Reviewer (Spring 2018, 2019, 2020)

Ohio State University School of Communication
    Peer Mentor (Autumn 2018–Spring 2019)

Ohio State University School of Communication - Graduate Student Organization
    Treasurer (Autumn 2016–Summer 2017)

Additional Training

Machine Learning & Deep Learning Workshops June 25 – July 28, 2022
    Sandia National Laboratories

Complex Systems Summer School June 10 – July 6, 2018
    Santa Fe Institute

Workshops on social network analysis June 14 – 15, 2017
    Political Networks Conference

Workshops on structural equation modeling August 8 – 9, 2016
    Statistical Horizons and The Ohio State University, School of Communication

Graduate teaching workshops August 15 – 17, 2015
    The Ohio State University, University Center for the Advancement of Teaching

Academic Appointments

The Ohio State University

Teaching

Social Media – Instructor of Record	Summer 2021
no evaluation data	
Communication Industry Research Methods – Laboratory Instructor	Spring 2021
Dr. Jason Coronel; Student evaluation: 5.00/5	
Communication Industry Research Methods – Laboratory Instructor	Fall 2020
Dr. Jason Coronel; Student evaluation: 4.44/5	
Communication Industry Research Methods – Instructor of Record	Summer 2020
Student evaluation: 4.64/5	
Communication Industry Research Methods – Laboratory Instructor	Spring 2019
Dr. Olga Kamenchuk; Student evaluation: 4.67/5	
Communication Industry Research Methods – Laboratory Instructor	Fall 2018
Dr. Olga Kamenchuk; Student evaluation: 4.05/5	
Persuasive Communication – Instructor of Record	Spring 2016
Student evaluation: 4.74/5	
Crisis Communication – Teaching Assistant	Fall 2015
Dr. Lanier Holt; no evaluation data	

Graduate Research Associate

Dr. Robert Bond	Fall 2016 – Summer 2017, Spring 2020
Dr. David DeAndrea	Fall 2019
Dr. Lanier Holt	Fall 2017 – Spring 2018
Dr. Jason Coronel	Summer 2016, Summer 2018

Professional Memberships

International Society for Computational Social Science (ISCSS)	Member, 2022 – *present*
International Communication Association (ICA)	Member, 2017 – *present*
National Communication Association (NCA)	Member, 2016 – *present*
American Political Science Association (APSA)	Member, 2016 – *present*

Professional References

Dr. Robert Bond (advisor)
School of Communication
The Ohio State University
bond.136@osu.edu

Dr. Hillary Shulman (committee)
School of Communication
The Ohio State University
shulman.36@osu.edu

Dr. William Eveland, Jr. (committee)
School of Communication
The Ohio State University
eveland.6@osu.edu

Dr. Jason Coronel
School of Communication
The Ohio State University
coronel.4@osu.edu

Dr. Thushara Gunda
Sandia National Laboratories
tgunda@sandia.gov

Dr. Asmeret Naugle
Sandia National Laboratories
abier@sandia.gov