

# Matthew D. Sweitzer, Ph.D.

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## Professional Experience

### **Sandia National Laboratories** – Machine Intelligence and Visualization

*Senior Member of Technical Staff*  
*Postdoctoral Appointee*  
*Graduate Technical Intern*

September 30, 2022 – *present*  
July 30, 2021 – September 30, 2022  
July 26, 2019 – July 30, 2021

### **Sandia National Laboratories** – Energy Water System Integration

*Graduate Technical Intern*

May 6, 2019 – July 26, 2019

- Served as work package manager for the DOE Office of Nuclear Energy's Spent Fuel and High-Level Waste Management program
- 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, Rust, HTML, CSS, and L<sup>A</sup>T<sub>E</sub>X

### *Machine Learning and Data Analytic Methods:*

pytorch, scikitlearn, ERGM-family and other methods for network analysis and simulation, time-series analysis, and statistical modeling (e.g., regression, Bayes)

### *Simulation Software:*

Mesa, Netlogo, Repast, N2A, and Anylogic

### *High-performance Computing Environments:*

Distributed batch processing using Slurm, Torque, Weights & Biases, Microsoft Azure, and Amazon AWS

### *Other Software/Platforms:*

Shiny, plotly, oTree, Breadboard, Amazon Mechanical Turk, Matlab, Stata, and SPSS

## Education

2015 – 2021

Ohio State University - Columbus

*Ph.D., Communication*

Dissertation:

“Selection homophily in dynamic political communication networks:  
An interpersonal perspective.”

Committee:

Dr. Robert Bond (Chair, School of Communication)

Dr. Skyler Cranmer (Political Science)

Dr. William Eveland, Jr. (School of Communication)

Dr. Hillary Shulman (School of Communication)

2015 – 2019

Ohio State University - Columbus

*M.A., Communication*

2008 – 2012

University of Missouri - Columbia

*B.A., Communication, with honors*

## Peer-Reviewed Publications

- Sweitzer, M. D.** & Gunda, T. (2024). Spatiotemporal analyses of news media coverage on “nuclear waste”: A natural language processing approach. *Nuclear Technology*, 210(9), 1706-1721. doi:10.1080/00295450.2023.2229566.
- Sweitzer, M. D.**, Gunda, T., & Gilligan, J. M. (2023). Water narratives in local newspapers within the United States. *Frontiers in Environmental Science - Water and Wastewater Management*, 11. doi:10.3389/fenvs.2023.1038904
- Coronel, J. C., Ott, J., Hubner, A., **Sweitzer, M. D.**, & Lerner, S. (2023). How are competitive framing environments transformed by person-to-person communication? An integrated social transmission, content analysis, and eye movement monitoring approach. *Communication Research*, 50(1), 3-29. doi:10.1177/0093650220903596
- Bayer, J. B., **Sweitzer, M. D.**, Xiang, H., Mohan, S., & Meyers, E. (2022). Reimagining the personal network: The case of Path. *Social Media & Society*, 8(3) 1-17. doi:10.1177/20563051221119475
- 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
- Shulman, H. C., **Sweitzer, M. D.**, Bullock, O. M., Coronel, J. C., Bond, R. M., & Poulsen, S. (2022). Predicting vote choice and election outcomes from ballot wording: The role of processing fluency in low information direct democracy elections. *Political Communication*, 39(5), 652-673. doi:10.1080/10584609.2022.2092920
- 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

## Selected Peer-Reviewed Conference Proceedings

- Sweitzer, M. D.**, Sanchez, D. N., Rogers, A., Gunda, T., Drakopoulos, L., & LaForce, T. (2024). Thematic shifts in discussion and questions about consent-based siting. In *Proceedings of the American Nuclear Society*. La Grange Park, IL: American Nuclear Society.
- Gunda, T., & **Sweitzer, M. D.** (2022). 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. (2022). 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., Laishram, 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](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](https://wiki.santafe.edu/images/9/9d/Proceedings_2018_v2.pdf)

## Selected Conference Presentations

- Machine Learning Conference (MLCON) 2024
- Detecting emergent discourse dynamics in online social media*  
**Sweitzer, M. D.**, Krofcheck, D., Doyle, C., Sorenson, A., & Naugle, A.
- Changes in emotional content of forum messages precede user action*  
 Doyle, C., Naugle, A., **Sweitzer, M. D.**, Krofcheck, D., & Sorenson, A.
- International Conference on Computational Social Science (IC2S2) 2024
- Detecting emergent discourse dynamics in online social media*  
**Sweitzer, M. D.**, Krofcheck, D., Doyle, C., Sorenson, A., & Naugle, A.
- Predicting children's comprehension of science concepts from real-world educational videos using eye movements and machine learning*  
 Coronel, J. C., **Sweitzer, M. D.**, Bonus, J. A., Dore, R. A., & Lerner, B.
- A dynamic model of the relationship between online influence and real-world action*  
 Naugle, A., Doyle, C., Krofcheck, D., **Sweitzer, M. D.**, & Sorenson, A.
- Changes in emotional content of forum messages precede user action*  
 Doyle, C., Naugle, A., **Sweitzer, M. D.**, Krofcheck, D., & Sorenson, A.
- American Nuclear Society (ANS) 2024
- Thematic shifts in discussion and questions about consent-based siting*  
**Sweitzer, M. D.**, Sanchez, D. N., Rogers, A., Gunda, T., Drakopoulos, L., & LaForce, T.
- Conference on Data Analysis (CoDA) 2023
- Detecting effective influence campaigns: Integrated theory-based modeling and data analysis of strategy, persuasion, and action*  
 Naugle, A., Krofcheck, D., Doyle, C., Sorensen, A., **Sweitzer, M. D.**, & Link, H.
- Longitudinal Analysis of Public Input for Consent-Based Siting: A Case Study of Human-Machine Teaming*  
 Gunda, T., Sanchez, D. N., **Sweitzer, M. D.**, & Rogers, A. N.
- Predicting action from topic, sentiment, and emotional content of forum posts*  
 Doyle, C., Naugle, A., Krofcheck, D., **Sweitzer, M. D.**, & Sorenson, A.
- 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 Social Computing, Behavioral-Cultural Modeling, & Prediction and Behavior Representation in Modeling and Simulation (SBP-BRiMS) 2022  
*A complex, integrative agent-based model of disinformation cascades*  
**Sweitzer, M. D.**, Lakkaraju, K., Wiryadinata, S., Lehrer, G., & Naugle, A.  
*A simulation test bed for evaluating data analytic predictors of disinformation flow*  
 Lakkaraju, K., **Sweitzer, M. D.**, Wiryadinata, S., Lehrer, G., & Naugle, A.
- 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 <i>More than a black and white issue: Racialized identity and support for Black Lives Matter</i> Holt, L. F., & <b>Sweitzer, M. D.</b>	2018
International Communication Association (ICA) Annual Convention <i>Political homophily in a large-scale online communication network</i> Bond, R. M., & <b>Sweitzer, M. D.</b>  <i>Down to a r/science: Integrating computational approaches to the study of communication on Reddit</i> Bond, R. M., Hubner, A., McKnight, J., & <b>Sweitzer, M. D.</b>  <i>The generation and spread of numerical misinformation: A combined eye movement and social transmission approach</i> Coronel, J. C., Poulsen, S., & <b>Sweitzer, M. D.</b>	2018
National Communication Association (NCA) Annual Convention <i>Survey of surveys: A content analysis of the language complexity in public opinion polls</i> <b>Sweitzer, M. D.</b> , & Shulman, H. C.	2017
Political Networks (PolNet) Conference <i>Partisan network selection: Theoretical and agent-based models of homophilic political discussion networks</i> <b>Sweitzer, M. D.</b> , & Bond, R. M.	2017
International Communication Association (ICA) Annual Convention <i>Eye movements as measures of memory in communication research (top paper)</i> Coronel, J. C., & <b>Sweitzer, M. D.</b>	2017
National Communication Association (NCA) Annual Convention <i>Advancing framing theory: Using frames to improve public opinion via metacognition</i> Shulman, H. C., & <b>Sweitzer, M. D.</b>	2016
American Political Science Association (APSA) Annual Meeting <i>Television news content predicts political knowledge</i> <b>Sweitzer, M. D.</b> , & Bond, R. M.  <i>Using structural topic models to assess television news content</i> Bond, R. M., & <b>Sweitzer, M. D.</b>	2016

## Research Grants

<i>Stakeholder Analytics Work Package</i> , \$371,962 - Department of Energy, Office of Nuclear Energy Principal Investigator: Matthew Sweitzer	2024
<i>Stakeholder Analytics Work Package</i> , \$467,921 - Department of Energy, Office of Nuclear Energy Principal Investigator: Matthew Sweitzer	2023
<i>Miller Research Award</i> , \$17,289 - Ohio State University, School of Communication Principal Investigator: Jason Coronel	2018

## Honors and Awards

<i>Michael Pfau Outstanding Article Award</i> for “Predicting vote choice and election outcomes from ballot wording: The role of processing fluency in low information direct democracy elections” National Communication Association – Political Communication Division	2024
<i>Thunderbird Achievement Award</i> for “Stakeholder Analytics” project leadership and deliverables Sandia National Laboratories	2022
<i>Walter Lippmann Best Article of the Year Award</i> for “Investigating the generation and spread of numerical misinformation” American Political Science Association – Political Communication Section	2021

<i>Best Paper Award</i> for “More than a black and white issue” The International Society for Self and Identity	2020
<i>Doris Gildea Morgan Scholarship Award</i> (senior researcher award) The Ohio State University School of Communication	2019
<i>Top Paper Award</i> for “Investigating how person-to-person communication transforms frames” National Communication Association – Political Communication Division	2019
<i>Walter B. Emery Memorial Scholarship Award</i> (junior researcher award) The Ohio State University School of Communication	2018
<i>Top Paper Award</i> for “Eye movements as measures of memory in communication research” International Communication Association – Communication, Science, & Biology Division	2017
<i>Travel Award</i> International Communication Association – Communication, Science, & Biology Division	2017
<i>Graduate Fellowship Award</i> Political Networks Conference	2017
<i>Honors Society Member</i> Lambda Pi Eta National Communication Honors Society, Chi Beta chapter	2011–present
<i>Edward and Ellen Kniep Memorial Scholarship</i> University of Missouri	2008 – 2012
<i>John and Virginia Sutherland Scholarship</i> University of Missouri	2008 – 2012

### Invited Talks

<i>Research Industry Career Opportunities after Grad School</i> University of New Mexico – Communication and Journalism Department	2023
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### Additional Training

<i>Machine Learning &amp; Deep Learning Workshops</i> Sandia National Laboratories	June 25 – July 28, 2022
<i>Complex Systems Summer School</i> Santa Fe Institute	June 10 – July 6, 2018
<i>Workshops on social network analysis</i> Political Networks Conference	June 14 – 15, 2017
<i>Workshops on structural equation modeling</i> Statistical Horizons and The Ohio State University, School of Communication	August 8 – 9, 2016
<i>Graduate teaching workshops</i> The Ohio State University, University Center for the Advancement of Teaching	August 15 – 17, 2015

## Professional Memberships

American Nuclear Society (ANS)	2023 – <i>present</i>
International Society for Computational Social Science (ISCSS)	2022 – <i>present</i>
International Communication Association (ICA)	2017 – <i>present</i>
National Communication Association (NCA)	2016 – <i>present</i>
American Political Science Association (APSA)	2016 – <i>present</i>

## Professional References

Dr. Thushara Gunda  
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Dr. Carmen Mendez  
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Dr. Robert Bond (advisor)  
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