

CASE 2022

**The 5th Workshop on Challenges and Applications of  
Automated Extraction of Socio-political Events from Text**

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# Keynote Talk: A total error approach to validating event data that is transparent, scalable, and practical to implement

Scott Althaus

University of Illinois Urbana-Champaign

**Abstract:** There are at least two reasonable ways to make your way toward where you want to go: looking down to carefully place one foot in front of the other, and looking up to focus on where you hope to arrive. Looking up beats looking down if there's a particular destination in mind, and for constructing valid event data that destination usually takes the form of high-quality human judgment. Yet many approaches to generating event data on protests and acts of political violence using fully-automated systems implicitly adopt a "looking down" approach by benchmarking validity as a series of incremental improvements over prior algorithmic efforts. And even those efforts that adopt a "looking up" approach often treat human-generated gold standard data as if it was *prima facie* valid, without ever testing or confirming the accuracy of this assumption. It stands to reason that if we want to automatically produce valid event data that approaches the validity of human judgment, then we also need to validate the human judgment tasks that provide the point of comparison. But because of obvious difficulties in implementing such a rigorous assessment within the time and budget constraints of typical research projects, this more rigorous double-validation approach is rarely attempted.

This presentation outlines a "looking up" approach for double-validating fully-automated event data developed by the Cline Center for Advanced Social Research at the University of Illinois Urbana-Champaign (USA), illustrates that approach with a test of the precision and recall for two widely-used event classification systems (the PETRARCH-2 coder used in Phoenix and TERRIER, as well as the BBN ACCENT coder used in W-ICEWS), and demonstrates the utility of the approach for developing fully-automated event data algorithms with levels of validity that approach the quality of human judgment.

The first part of the talk reviews the Cline Center's total error framework for identifying 19 types of error that can affect the validity of event data and addresses the challenge of applying a total error framework when authoritative ground truth about the actual distribution of relevant events is lacking (Althaus, Peyton, and Shalmon, 2022). We argue that carefully constructed gold standard datasets can effectively benchmark validity problems even in the absence of ground truth data about event populations. We propose that a strong validity assessment for event data should, at a minimum, possess three characteristics. First, there should be a standard describing ideal data; a gold standard that, in the best case, takes the form of ground truth. Second, there should be a direct "apples to apples" comparison of outputs from competing methods given identical input. Third, the test should use appropriate metrics for measuring agreement between the gold standard and data produced by competing approaches.

The second part of the talk presents the results of a validation exercise meeting all three criteria that is applied to two algorithmic event data pipelines: the Python Engine for Text Resolution and Related Coding Hierarchy (PETRARCH-2) and the BBN ACCENT event coder. It then reviews a recent Cline Center project that has built a fully-automated event coder which produces dramatic improvements in validity over both PETRARCH-2 and BBN ACCENT by leveraging the total error framework and a reliance on the double-validation approach using high-quality gold standard benchmark datasets.

**Bio:** Scott Althaus (<https://pol.illinois.edu/directory/profile/salthaus>): is Merriam Professor of Political Science, Professor of Communication, and Director of the Cline Center for Advanced Social Research at the University of Illinois Urbana-Champaign. He also has faculty appointments with the School of Information Sciences and the National Center for Supercomputing Applications. His work with the Cline Center applies text analytics methods and Artificial Intelligence algorithms to extract insights from millions of news stories in ways that produce new forms of knowledge that advance societal well-being around the world. His own research interests explore the communication processes that support political

accountability in democratic societies and that empower political discontent in non-democratic societies. His interests focus on four areas of inquiry: (1) how journalists construct news coverage about public affairs, (2) how leaders attempt to shape news coverage for political advantage, (3) how citizens use news coverage for making sense of public affairs, and (4) how the opinions of citizens are communicated back to leaders. He has particular interests in popular support for war, data science methods for extreme-scale analysis of news coverage, cross-national comparative research on political communication, the psychology of information processing, and communication concepts in democratic theory. His current projects include using data mining methods to help journalists cover terrorist attacks in responsible ways, a solo-authored book manuscript to be published by Cambridge University Press about the dynamics of popular support for war in the United States, and a co-authored book manuscript (with Tamir Sheafer and Gadi Wolfsfeld) in press with Oxford University Press on understanding the role of media in supporting governmental accountability and increasing the government's responsiveness to citizen needs.

J. Craig Jenkins (<https://sociology.osu.edu/people/jenkins.12>) is Academy Professor Emeritus of Sociology at The Ohio State University. He directed the Mershon Center for International Security Studies from 2011 to 2015 and is now senior research scientist. Jenkins is author of more than 100 referred articles and book chapters, as well as author or editor of several books including *The Politics of Insurgency: The Farm Worker's Movement of the 1960s* (1986); *The Politics of Social Protest: Comparative Perspectives on States and Social Movements*, with Bert Klandermans (University of Minnesota Press, 1995); *Identity Conflicts: Can Violence be Regulated?*, with Esther Gottlieb (Transaction Publishers, 2007) and *Handbook of Politics: State and Society in Global Perspective*, with Kevin T. Leicht (Springer, 2010). He has received numerous awards, including the Robin M. Williams Jr. Award for Distinguished Contributions to Scholarship, Teaching and Service from the Section on Peace, War and Social Conflict of the American Sociological Association (2015), fellow of the American Association for the Advancement of Science (2009), Joan Huber Faculty Fellow (2003), chair of the Section on Committees of the American Sociological Association (1998-2000), chair of the Section on Political Sociology, ASA (1995-96), and chair of the Section on Collective Behavior and Social Movements, ASA (1994-95). He was elected to the Sociological Research Association in 1993 and was a national security fellow at the Mershon Center for International Security at Ohio State in 1988, a Mershon Center professor from 2003-06 and chair of the Sociology Department, 2006-2010. Jenkins has received numerous grants from funding agencies, including the National Science Foundation, National Endowment for Humanities and Russell Sage Foundation. In 2010-11, he received a Liev Eriksson Mobility Grant from the Norway Research Council. In 2011-12, Jenkins was a Fulbright Fellow to Norway and a visiting professor at the Peace Research Institute of Oslo (PRIO) in Oslo, Norway. In 2017, Jenkins and co-investigator Maciek Slomczynski received a \$1.4 million grant from the National Science Foundation for a four-year project on "Survey Data Recycling: New Analytic Framework, Integrated Database and Tools for Cross-National Social, Behavioral and Economic Research." Jenkins has served as deputy editor of *American Sociological Review* (1986-1989), and on the editorial boards of *Journal of Political and Military Sociology*, *International Studies Quarterly*, *Sociological Forum*, and *Sociological Quarterly*.

# Keynote Talk: Event Extraction in the Era of Large Language Models: Structure Induction and Multilingual Learning

Thien Huu Nguyen  
University of Oregon

**Abstract:** Events such as protests, disease outbreaks, and natural disasters are prevalent in text from different languages and domains. Event Extraction (EE) is an important task of Information Extraction that aims to identify events and their structures in unstructured text. The last decade has witnessed significant progress for EE research, featuring deep learning and large language models as the state-of-the-art technologies. However, a key issue of existing EE methods involves modeling input text sequentially to solve each EE tasks separately, thus limiting the abilities to encode long text and capture various types of dependencies to improve EE performance. In this talk, I will present some of our recent efforts to address this issue where text structures are explicitly learned to realize important objects and their interactions to facilitate the predictions for EE.

In addition, current EE research still mainly focuses on a few popular languages, e.g., English, Chinese, Arabic, and Spanish, leaving many other languages unexplored for EE. In this talk, I will also introduce our current research focus on developing evaluation benchmarks and models to extend EE systems to multiple new languages, i.e., multilingual and cross-lingual learning for EE. Finally, I will highlight some research challenges that can be studied in future work for EE.

**Bio:** Thien Huu Nguyen (<https://ix.cs.uoregon.edu/thien/>) is an assistant professor in the Department of Computer and Information Science at the University of Oregon. He obtained his Ph.D. in natural language processing (NLP) at New York University (working with Ralph Grishman) and did a postdoc at the University of Montreal (working with Yoshua Bengio). Thien's research areas involve information extraction, language grounding, and deep learning where he developed one of the first deep learning models for entity recognition, relation extraction, and event extraction. His current research explores multi-domain and multilingual NLP that aims to learn transferable representations to perform information extraction tasks over different domains and languages. Thien is the director of the NSF IUCRC Center for Big Learning (CBL) at the University of Oregon. His research has been supported by NSF, IARPA, Army Research Office, Adobe Research, and IBM Research.

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- 09:00 - 18:30     *Day 1*
- 09:00 - 17:30     *Tutorials*
- 11:00 - 12:30     *Poster Session (S2)*
- 12:30 - 14:00     *Lunch Break (LB)*
- 14:00 - 15:30     *Afternoon Session (S3)*
- 15:30 - 16:00     *Afternoon Coffee Break (B2)*
- 16:00 - 17:30     *Afternoon Session (S4)*
- 17:30 - 18:30     *Keynote 1 Session (S5)*

**Thursday, December 8, 2022**

- 09:00 - 18:30     *Day 2*
- 09:00 - 17:30     *Tutorials*
- 11:00 - 12:30     *Poster Session (S2)*
- 12:30 - 14:00     *Lunch Break (LB)*
- 14:00 - 15:30     *Afternoon Session (S3)*
- 15:30 - 16:00     *Afternoon Coffee Break (B2)*
- 16:00 - 17:30     *Afternoon Session (S4)*
- 17:30 - 18:30     *Keynote 2 Session (S5)*