

Steven Bethard

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College of Information Science
University of Arizona

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RESEARCH INTERESTS

Natural language processing and machine learning theory and applications, including modeling the language of time and timelines, normalizing text to medical and geospatial ontologies, and information extraction models for clinical applications.

CHRONOLOGY OF EDUCATION

2002-08 – 2007-12 Ph.D. Computer Science and Cognitive Science, University of Colorado
Dissertation: [Finding Event, Temporal and Causal Structure in Text: A Machine Learning Approach](#). Advisor: James H. Martin
1998-08 – 2002-05 B.S., B.A. Computer Science, Mathematics, Linguistics, University of Arizona

CHRONOLOGY OF EMPLOYMENT

2021-11 –	GIDP Faculty	University of Arizona, Applied Mathematics GIDP
2020-08 –	Associate Professor	University of Arizona, School of Information
2020-02 –	Courtesy Appointment	University of Arizona, Computer Science
2017-03 –	Courtesy Appointment	University of Arizona, Linguistics
2016-10 –	GIDP Faculty	University of Arizona, Cognitive Science GIDP
2016-08 – 2020-08	Assistant Professor	University of Arizona, School of Information
2013-08 – 2016-08	Assistant Professor	University of Alabama at Birmingham, Department of Computer and Information Sciences
2011-10 – 2015-10	Visiting Professor	KU Leuven, Department of Computer Science
2011-09 – 2013-08	Research Associate	University of Colorado, Institute of Cognitive Science
2010-09 – 2011-08	Postdoctoral Fellow	KU Leuven, Department of Computer Science
2009-06 – 2009-08	Senior Research Scientist	Johns Hopkins University, Human Language Technology Center of Excellence
2009-01 – 2010-08	Postdoctoral Scholar	Stanford University, Department of Computer Science
2008-01 – 2008-12	Research Associate	University of Colorado, Institute of Cognitive Science

HONORS AND AWARDS

2024-04 Research Excellence Award (\$500), University of Arizona School of Information
2021-04 Teaching Award, University of Arizona School of Information
2016-02 Kevin and Jo Ann Reilly Endowed Award (\$1000), University of Alabama at Birmingham
2009-06 Vannevar Bush Best Paper Award (\$1000), Joint Conference on Digital Libraries
2008-12 Daniel Henkel Service Award, University of Colorado Office of International Education
2002-03 NSF Graduate Research Fellowship Honorable Mention
1998-08 Flinn Scholar
1998-08 National Merit Scholar

SERVICE/OUTREACH

LOCAL/STATE OUTREACH

2015, 2016 Site coordinator, North American Computational Linguistics Olympiad

NATIONAL/INTERNATIONAL SERVICE: COMMITTEES

2024-2026 Treasurer, Nations of the Americas Chapter of the Association for Computational Linguistics

2024-2026 Member, Peer Review Standing Committee of the Association for Computational Linguistics

2022-2024 President, Special Interest Group on the Lexicon (SIGLEX)

of the Association for Computational Linguistics

2020-2022 Vice-President Elect, Special Interest Group on the Lexicon (SIGLEX)

of the Association for Computational Linguistics

2016-2020 Board member (SemEval representative), Special Interest Group on the Lexicon (SIGLEX)

of the Association for Computational Linguistics

NATIONAL/INTERNATIONAL SERVICE: CONFERENCE ORGANIZATION

2025 Senior area chair, Annual Meeting of the Association for Computational Linguistics (ACL)

2025 Area chair, Joint Conference on Lexical and Computational Semantics (*SEM)

2023-2024 Program Chair, North American Chapter of the Association for Computational Linguistics (NAACL)

2016, 2019, 2020, 2022-2024

Organizer, Clinical Natural Language Processing Workshop (Clinical NLP)

2021 Area chair, Annual Meeting of the Association for Computational Linguistics (ACL)

2021 Publication Chair, North American Chapter of the Association for Computational Linguistics (NAACL)

2021 Organizer, Source-Free Domain Adaptation for Semantic Processing shared task

2020 Publication Chair, Annual Meeting of the Association for Computational Linguistics (ACL)

2019 Area chair, Annual Meeting of the Association for Computational Linguistics (ACL)

2019 Area chair, North American Chapter of the Association for Computational Linguistics (NAACL)

2018 Organizer, Parsing Time Normalizations shared task

2016–2018 Co-Chair, International Workshop on Semantic Evaluation (SemEval)

2015–2017 Organizer, Clinical TempEval shared task

2015–2016 Area chair, Annual Meeting of the Association for Computational Linguistics (ACL)

2014 Organizer, Workshop on Computational Approaches to Causality in Language

2014 Organizer, Language Identification in Code-Switched Data shared task

2013 Publication Chair, Empirical Methods in Natural Language Processing (EMNLP)

2013 Faculty advisor, ACL Student Research Workshop

2012–2013 Organizer, SemEval Spatial Role Labeling Task

2011–2012 Mentor, ACL Student Research Workshop

2011 Organizer, American Medical Informatics Association Virtual Journal Club on Temporal Reasoning

NATIONAL/INTERNATIONAL SERVICE: GRANT REVIEWING

2026 US National Institutes of Health, Pioneer Award

2025 US National Institutes of Health, Health Services Research

2023 US National Institutes of Health, Health Services and Systems
 2022, 2023 US National Science Foundation, Division of Behavioral and Cognitive Sciences
 2022 US National Institutes of Health, Clinical Data Management and Analysis
 2021 US National Institutes of Health, Risk, Prevention and Health Behavior
 2021 Israeli Ministry of Science and Technology, Natural Language Processing
 2020 México: Consejo Nacional de Ciencia y Tecnología, Frontier Science
 2013, 2015, 2018
 US National Science Foundation, Division of Information and Intelligent Systems
 2017 Israel Science Foundation (ISF), Individual Research Grants
 2017 US National Institutes of Health, Biomedical Library and Informatics
 2017 Netherlands Organization for Scientific Research (NWO), Council for the Humanities
 2016 Swiss National Science Foundation, Division of Mathematics, Physical and Engineering Sciences

NATIONAL/INTERNATIONAL SERVICE: JOURNAL REVIEWING

2016–2025 Transactions of the Association for Computational Linguistics (TACL), standing reviewer
 2014, 2019, 2023, 2024
 Journal of the American Medical Informatics Association (JAMIA)
 2011–2013, 2022, 2024
 Journal of Artificial Intelligence Research (JAIR)
 2023–2024 Artificial Intelligence In Medicine
 2024–2025 npj Digital Medicine
 2008, 2022, 2023
 Language Resources and Evaluation (LRE)
 2012–2013, 2015, 2019–2021
 Journal of Natural Language Engineering (JNLE)
 2019–2020 Transactions on Audio, Speech and Language Processing
 2018–2019 Journal of Biomedical Informatics
 2018 PLOS ONE
 2013, 2015 Cognition
 2014 Computational Linguistics (CL)
 2013–2014 Transactions on Asian Language Information Processing (TALIP)
 2013 Journal of Language Modeling (JLM)
 2013 Transactions on Information Forensics & Security (TIFS)
 2010–2011 International Journal on Digital Libraries (IJDL)
 2011 Transactions on Computational Biology and Bioinformatics (TCBB)

NATIONAL/INTERNATIONAL SERVICE: CONFERENCE REVIEWING

2026 International Conference on Learning Representations
 2021–2025 Association for Computational Linguistics Rolling Review (ARR), Action Editor
 2024 Conference on Language Modeling (COLM)
 2009, 2011, 2013–2022
 Empirical Methods in Natural Language Processing (EMNLP)
 2012, 2016, 2022
 International Conference on Computational Linguistics (COLING)
 2018 Machine Learning for Healthcare (MLHC)

2009, 2011–2014, 2017–2018
 Annual Meeting of the Association for Computational Linguistics (ACL)
 2010, 2012–2013, 2016, 2018
 North American Chapter of the Association for Computational Linguistics (NAACL)
 2012–2013, 2023
 Joint Conference on Lexical and Computational Semantics (*SEM)
 2017
 International Joint Conference on Natural Language Processing (IJCNLP)
 2016
 International Joint Conference on Artificial Intelligence (IJCAI)
 2015–2016
 International World Wide Web Conference (WWW)
 2012, 2014
 European Chapter of the Association for Computational Linguistics (EACL)
 2013
 American Medical Informatics Association Annual Symposium (AMIA)
 2010–2013
 Joint Conference on Digital Libraries (JCDL)
 2011
 Conference on Natural Language Learning (CoNLL)
 2010
 International Conference on Language Resources and Evaluation (LREC)
 2007–2008
 IEEE International Conference on Semantic Computing (ICSC)

NATIONAL/INTERNATIONAL SERVICE: WORKSHOP REVIEWING

2025
 NAACL Student Research Workshop
 2021–2023
 Workshop on Biomedical Language Processing (BioNLP)
 2021
 Workshop on Domain Adaptation for NLP (Adapt-NLP)
 2012–2018, 2021–2022
 International Workshop on Semantic Evaluation (SemEval)
 2019
 Workshop on Natural Language Processing and Computational Social Science
 2019, 2021, 2023
 Combined Workshop on Spatial Language Understanding (SpLU)
 & Grounded Communication for Robotics (RoboNLP)
 2018–2020
 International Workshop on Spatial Language Understanding (SpLU)
 2020, 2023
 Workshop for Natural Language Processing Open Source Software (NLP-OSS)
 2017
 Workshop on Ethics in Natural Language Processing (EthNLP)
 2016
 Workshop on Cross-Platform Text Mining and Natural Language Processing Interoperability
 2015
 Workshop on Replicability and Reusability in Natural Language Processing (RRNLP)
 2014
 Workshop on Computational Approaches to Causality in Language (CAtoCL)
 2014
 Workshop on Computational Approaches to Code Switching (CodeSwitch)
 2014
 Workshop on Open Infrastructures and Analysis Frameworks for HLT (OIAF4HLT)

DEPARTMENTAL SERVICE

2023–2024, 2025–2026
 Chair, faculty search committee, University of Arizona College of Information Science
 2022, 2025
 Chair, faculty promotion committee, University of Arizona College of Information Science
 2019, 2020, 2023, 2025
 Member, faculty promotion committee, University of Arizona College of Information Science
 2023–2024
 Member, peer review committee, University of Arizona School of Information
 2022–2023
 Member, Inclusion, Diversity, Equity, Access, actionable Leadership and Strategy (IDEALS)
 committee, University of Arizona School of Information
 2018–2023
 Academic Advisor for MS INFO students, University of Arizona School of Information
 2017–2023
 Member, curriculum committee, University of Arizona School of Information

2016–2017, 2018–2023

Graduate committee, University of Arizona School of Information

2015–2016 Member, faculty search committee, University of Alabama at Birmingham

Computer and Information Science

2014–2016 Member, undergraduate curriculum committee, University of Alabama at Birmingham

Computer and Information Science

2014–2016 Member, Ph.D. qualifying exam committee, University of Alabama at Birmingham

Computer and Information Science

2004–2007 Member, student grants committee, University of Colorado Boulder

Institute of Cognitive Science

2004 Member, faculty search committee, University of Colorado Boulder

Department of Linguistics

COLLEGE-LEVEL SERVICE

2019–2023 Computational Social Science Advisory Committee,

University of Arizona College of Social and Behavioral Sciences

2012–2013 Curriculum design committee, University of Colorado Boulder social media certificate

UNIVERSITY-LEVEL SERVICE

2018–2026 Data Science Resources and Training Steering Committee, University of Arizona

2023–2024 Artificial Intelligence Access and Integrity Working Group, University of Arizona

2018–2021 Cognitive Science GIDP Executive Committee

2007–2008 CU International Leader, University of Colorado Boulder

2005–2007 International Peer Mentor, University of Colorado Boulder

PUBLICATIONS/CREATIVE ACTIVITY

Notes:

Co-authors who were undergraduate, graduate, or postdoctoral advisees are marked with [⊙].

Publications based substantially on work done as a graduate student are marked with [★].

The Google Scholar h5-index is noted beside the venue when available.

CHAPTERS IN SCHOLARLY BOOKS AND MONOGRAPHS

1. Yotam Shmargad, Stephen A Rains, Kevin Coe, Kate Kenski, and **Steven Bethard**. “[Detecting Antisocial Norms in Large-Scale Online Discussions](#)”. In: *Social processes of online hate*. Ed. by Joseph B. Walther and Ronald E. Rice. July 2024, pp. 220–249.
2. **Steven Bethard**. “[Machine Learning and Deep Learning Algorithms](#)”. In: *Natural Language Processing in Biomedicine: A Practical Guide*. Ed. by Hua Xu and Dina Demner Fushman. 2024, pp. 43–76.
3. Samuel González López, **Steven Bethard**, and Aurelio López-López. “[Identifying Weak Sentences in Student Drafts: A Tutoring System](#)”. In: *Methodologies and Intelligent Systems for Technology Enhanced Learning*. Ed. by Tania Di Mascio, Rosella Gennari, Pierpaolo Vitorini, Rosa Vicari, and Fernando de la Prieta. Vol. 292. Advances in Intelligent Systems and Computing. June 2014, pp. 77–85.
4. **Steven Bethard**, Hong Yu, Ashley Thornton, Vasileios Hatzivassiloglou, and Dan Jurafsky. [★]“[Extracting opinion propositions and opinion holders using syntactic and lexical cues](#)”. In: *Computing Attitude and Affect in Text: Theory and Applications*. Ed. by James G. Shanahan, Yan Qu, and Janyce Wiebe. 2005, pp. 125–141.

EDITED CONFERENCE PROCEEDINGS

5. Asma Ben Abacha, **Steven Bethard**, Danielle Bitterman, Tristan Naumann, and Kirk Roberts, eds. [“Proceedings of the 7th Clinical Natural Language Processing Workshop”](#). Oct. 2025.
6. Kevin Duh, Helena Gomez, and **Steven Bethard**, eds. [“Findings of the Association for Computational Linguistics: NAACL 2024”](#). June 2024.
7. Kevin Duh, Helena Gomez, and **Steven Bethard**, eds. [“Proceedings of the 2024 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies \(Volume 1: Long Papers\)”](#). June 2024.
8. Kevin Duh, Helena Gomez, and **Steven Bethard**, eds. [“Proceedings of the 2024 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies \(Volume 2: Short Papers\)”](#). June 2024.
9. Tristan Naumann, Asma Ben Abacha, **Steven Bethard**, Kirk Roberts, and Danielle Bitterman, eds. [“Proceedings of the 6th Clinical Natural Language Processing Workshop”](#). June 2024.
10. Tristan Naumann, Asma Ben Abacha, **Steven Bethard**, Kirk Roberts, and Anna Rumshisky, eds. [“Proceedings of the 5th Clinical Natural Language Processing Workshop”](#). July 2023.
11. Tristan Naumann, **Steven Bethard**, Kirk Roberts, and Anna Rumshisky, eds. [“Proceedings of the 4th Clinical Natural Language Processing Workshop”](#). July 2022.
12. Kristina Toutanova, Anna Rumshisky, Luke Zettlemoyer, Dilek Hakkani-Tur, Iz Beltagy, **Steven Bethard**, Ryan Cotterell, Tanmoy Chakraborty, and Yichao Zhou, eds. [“Proceedings of the 2021 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies”](#). June 2021.
13. Anna Rumshisky, Kirk Roberts, **Steven Bethard**, and Tristan Naumann, eds. [“Proceedings of the 3rd Clinical Natural Language Processing Workshop”](#). Nov. 2020.
14. Anna Rumshisky, Kirk Roberts, **Steven Bethard**, and Tristan Naumann, eds. [“Proceedings of the 2nd Clinical Natural Language Processing Workshop”](#). June 2019.
15. Marianna Apidianaki, Saif M. Mohammad, Jonathan May, Ekaterina Shutova, **Steven Bethard**, and Marine Carpuat, eds. [“Proceedings of The 12th International Workshop on Semantic Evaluation \(SemEval-2018\)”](#). June 2018.
16. **Steven Bethard**, Marine Carpuat, Marianna Apidianaki, Saif M. Mohammad, Daniel Cer, and David Jurgens, eds. [“Proceedings of the 11th International Workshop on Semantic Evaluation \(SemEval-2017\)”](#). Aug. 2017.
17. Anna Rumshisky, Kirk Roberts, **Steven Bethard**, and Tristan Naumann, eds. [“Proceedings of the Clinical Natural Language Processing Workshop \(ClinicalNLP\)”](#). Dec. 2016.
18. **Steven Bethard**, Marine Carpuat, Daniel Cer, David Jurgens, Preslav Nakov, and Torsten Zesch, eds. [“Proceedings of the 10th International Workshop on Semantic Evaluation \(SemEval-2016\)”](#). June 2016.
19. Oleksandr Kolomiyets, Marie-Francine Moens, Martha Palmer, James Pustejovsky, and **Steven Bethard**, eds. [“Proceedings of the EACL 2014 Workshop on Computational Approaches to Causality in Language \(CAtoCL\)”](#). Apr. 2014.
20. David Yarowsky, Timothy Baldwin, Anna Korhonen, Karen Livescu, and **Steven Bethard**, eds. [“Proceedings of the 2013 Conference on Empirical Methods in Natural Language Processing”](#). Oct. 2013.

21. Anik Dey, Sebastian Krause, Ivelina Nikolova, Eva Vecchi, **Steven Bethard**, Preslav I. Nakov, and Feiyu Xu, eds. “51st Annual Meeting of the Association for Computational Linguistics Proceedings of the Student Research Workshop”. Aug. 2013.

REFEREED JOURNAL ARTICLES

22. Yingya Li, Timothy Miller, **Steven Bethard**, and Guergana Savova. “Identifying task groupings for multi-task learning using pointwise V-usable information”. In: *Journal of Biomedical Informatics* h5-index: 73 169 (July 2025), p. 104881.
23. Ashley Stava, Wayne E Thogmartin, Robert Merideth, **Steven Bethard**, Faiz Currim, Jonathan J Derbridge, Kirk Emerson, Egoitz Laparra[○], Aaron Lien, Emily McGovern, Justin Pidot, Marc Miller, Krista Romero-Cardenas, Blaze Smith, Carly Winnebald, and Laura López-Hoffman. “Quantifying the substantive influence of public comment on United States federal environmental decisions under NEPA”. In: *Environmental Research Letters* h5-index: 123 20.7 (June 2025), p. 074028.
24. Juliana L. Barbati, Stephen A. Rains, Kate Kenski, Yotam Shmargad, **Steven Bethard**, and Kevin Coe. “Examining the Dynamics of Uncivil Discourse Between Sub-National Political Officials and the Public on Twitter”. In: *Mass Communication and Society* h5-index: 34 28.1 (Jan. 2025), pp. 154–173.
25. Zeyu Zhang[○] and **Steven Bethard**. “A survey on geocoding: algorithms and datasets for toponym resolution”. en. In: *Language Resources and Evaluation* h5-index: 36 (June 2024).
26. Egoitz Laparra[○], Alex Binford-Walsh, Kirk Emerson, Marc L. Miller, Laura López-Hoffman, Faiz Currim, and **Steven Bethard**. “Addressing structural hurdles for metadata extraction from environmental impact statements”. In: *Journal of the Association for Information Science and Technology* h5-index: 51 74.9 (June 2023), pp. 1124–1139.
27. Stephen A. Rains, Kate Kenski, Leah Dajches, Kaylin Duncan, Kun Yan, Yejin Shin, Jules L. Barbati, **Steven Bethard**, Kevin Coe, and Yotam Shmargad. “Engagement with incivility in tweets from and directed at local elected officials”. In: *Communication and Democracy* 57.1 (Apr. 2023), pp. 143–152.
28. Stephen A Rains, Jake Harwood, Yotam Shmargad, Kate Kenski, Kevin Coe, and **Steven Bethard**. “Engagement with partisan Russian troll tweets during the 2016 U.S. presidential election: a social identity perspective”. In: *Journal of Communication* h5-index: 44 73.1 (Dec. 2022), pp. 38–48.
29. Kirk Emerson, Elizabeth Baldwin, Tyler A. Scott, Justin R. Pidot, Aaron M. Lien, Faiz Currim, **Steven Bethard**, Sudha Ram, Marc L. Miller, and Laura López-Hoffman. “Toward NEPA performance: A framework for assessing EIAs”. In: *Environmental Impact Assessment Review* h5-index: 86 97 (Nov. 2022), p. 106879.
30. Stephen A Rains, Yotam Shmargad, Kevin Coe, Kate Kenski, and **Steven Bethard**. “Assessing the Russian Troll Efforts to Sow Discord on Twitter during the 2016 U.S. Election”. In: *Human Communication Research* h5-index: 30 47.4 (Aug. 2021), pp. 477–486.
31. Samuel González-López, **Steven Bethard**, Francisca Cecilia Encinas Orozco, and Adrian Pastor López-Monroy. “Consumer Cynicism Identification for Spanish Reviews using a Spanish Transformer Model”. In: *Procesamiento del Lenguaje Natural* h5-index: 24 66.0 (Mar. 2021), pp. 111–120.
32. Dongfang Xu[○], Manoj Gopale[○], Jiacheng Zhang[○], Kris Brown, Edmon Begoli, and **Steven Bethard**. “Unified Medical Language System resources improve sieve-based generation and Bidirectional Encoder Representations from Transformers (BERT)-based ranking for concept normalization”. In: *Journal of the American Medical Informatics Association* h5-index: 91 (July 2020).

33. Egoitz Laparra[○], **Steven Bethard**, and Timothy A Miller. “Rethinking domain adaptation for machine learning over clinical language”. In: *JAMIA Open* h5-index: 37 (Apr. 2020).
34. Chen Lin, **Steven Bethard**, Dmitriy Dligach, Farig Sadeque[○], Guergana Savova, and Timothy A Miller. “Does BERT need domain adaptation for clinical negation detection?”. In: *Journal of the American Medical Informatics Association* h5-index: 91 27.4 (Feb. 2020), pp. 584–591.
35. Samuel González López, Aurelio López-López, **Steven Bethard**, and Jesús Miguel García Gorrostieta. “A Model for Identifying Steps in Undergraduate Thesis Methodology”. In: *Research in Computing Science* 148.5 (2019), pp. 17–24.
36. Egoitz Laparra[○], Dongfang Xu[○], and **Steven Bethard**. “From Characters to Time Intervals: New Paradigms for Evaluation and Neural Parsing of Time Normalizations”. In: *Transactions of the Association for Computational Linguistics* h5-index: 96 6 (May 2018), pp. 343–356.
37. John D. Osborne[○], Matthew B. Neu, Maria I. Danila, Tamar Solorio, and Steven J. Bethard. “CUILESS2016: a clinical corpus applying compositional normalization of text mentions”. In: *Journal of Biomedical Semantics* h5-index: 21 9.1 (Jan. 2018), p. 2.
38. Timothy Miller, Dmitriy Dligach, **Steven Bethard**, Chen Lin, and Guergana Savova. “Towards generalizable entity-centric clinical coreference resolution”. In: *Journal of Biomedical Informatics* h5-index: 73 69 (May 2017), pp. 251–258.
39. Chen Lin, Dmitriy Dligach, Timothy A Miller, **Steven Bethard**, and Guergana K Savova. “Multilayered temporal modeling for the clinical domain”. In: *Journal of the American Medical Informatics Association* h5-index: 91 23.2 (Mar. 2016), pp. 387–395.
40. John D Osborne[○], Matthew Wyatt, Andrew O Westfall, James Willig, **Steven Bethard**, and Geoff Gordon. “Efficient identification of nationally mandated reportable cancer cases using natural language processing and machine learning”. In: *Journal of the American Medical Informatics Association* h5-index: 91 (Mar. 2016).
41. Ligaj Pradhan, Chengcui Zhang, and **Steven Bethard**. “Extracting Hierarchy of Coherent User Concerns to Discover Intricate User Behavior from User Reviews”. In: *International Journal of Multimedia Data Engineering and Management (IJMDEM)* 7.4 (2016), pp. 63–80.
42. Quynh Thi Ngoc Do, **Steven Bethard**, and Marie-Francine Moens. “Domain Adaptation in Semantic Role Labeling Using a Neural Language Model and Linguistic Resources”. In: *IEEE/ACM Transactions on Audio, Speech, and Language Processing* h5-index: 79 23.11 (Nov. 2015), pp. 1812–1823.
43. Wim De Mulder, **Steven Bethard**, and Marie-Francine Moens. “A survey on the application of recurrent neural networks to statistical language modeling”. In: *Computer Speech & Language* h5-index: 47 30.1 (Mar. 2015), pp. 61–98.
44. Nathanael Chambers, Taylor Cassidy, Bill McDowell, and **Steven Bethard**. “Dense Event Ordering with a Multi-Pass Architecture”. In: *Transactions of the Association for Computational Linguistics* h5-index: 96 2 (Oct. 2014), pp. 273–284.
45. Md. Arafat Sultan, **Steven Bethard**, and Tamara Sumner. “Back to Basics for Monolingual Alignment: Exploiting Word Similarity and Contextual Evidence”. In: *Transactions of the Association for Computational Linguistics* h5-index: 96 2 (May 2014), pp. 219–230.

46. William F. Styler IV, **Steven Bethard**, Sean Finan, Martha Palmer, Sameer Pradhan, Piet C. de Groen, Brad Erickson, Timothy Miller, Chen Lin, Guergana Savova, and James Pustejovsky. “[Temporal Annotation in the Clinical Domain](#)”. In: *Transactions of the Association for Computational Linguistics* [h5-index: 96] 2 (Apr. 2014), pp. 143–154.
47. Jyotishman Pathak, Kent R Bailey, Calvin E Beebe, **Steven Bethard**, David S Carrell, Pei J Chen, Dmitriy Dligach, Cory M Endle, Lacey A Hart, Peter J Haug, Stanley M Huff, Vinod C Kaggal, Dingcheng Li, Hongfang Liu, Kyle Marchant, James Masanz, Timothy Miller, Thomas A Oniki, Martha Palmer, Kevin J Peterson, Susan Rea, Guergana K Savova, Craig R Stancl, Sunghwan Sohn, Harold R Solbrig, Dale B Suesse, Cui Tao, David P Taylor, Les Westberg, Stephen Wu, Ning Zhuo, and Christopher G Chute. “[Normalization and standardization of electronic health records for high-throughput phenotyping: the SHARPN consortium](#)”. In: *Journal of the American Medical Informatics Association* [h5-index: 91] 20.e2 (Nov. 2013), e341–e348.
48. Dmitriy Dligach, **Steven Bethard**, Lee Becker, Timothy Miller, and Guergana K. Savova. “[Discovering body site and severity modifiers in clinical texts](#)”. In: *Journal of the American Medical Informatics Association* [h5-index: 91] (Oct. 2013).
49. Philipp Wetzler, **Steven Bethard**, Heather Leary, Kirsten Butcher, Soheil Danesh Bahreini, Jin Zhao, James H. Martin, and Tamara Sumner. “[Characterizing and Predicting the Multifaceted Nature of Quality in Educational Web Resources](#)”. In: *ACM Transactions on Interactive Intelligent Systems* [h5-index: 33] 3.3 (Oct. 2013), 15:1–15:25.
50. Michael Levin, Stefan Krawczyk, **Steven Bethard**, and Dan Jurafsky. “[Citation-based bootstrapping for large-scale author disambiguation](#)”. In: *Journal of the American Society for Information Science and Technology* [h5-index: 51] 63.5 (May 2012), pp. 1030–1047.
51. **Steven Bethard**, Zhiyong Lu, James H. Martin, and Lawrence Hunter. ★“[Semantic Role Labeling for Protein Transport Predicates](#)”. In: *BMC Bioinformatics* [h5-index: 73] 9.1 (June 2008), p. 277.
52. **Steven Bethard**, James H. Martin, and Sara Klingenstein. ★“[Finding Temporal Structure in Text: Machine Learning of Syntactic Temporal Relations](#)”. In: *International Journal of Semantic Computing (IJSC)* [h5-index: 11] 1.4 (Dec. 2007), pp. 441–458.

REFEREED CONFERENCE ARTICLES

53. Xin Su[⊙], Sungduk Yu, Phillip Howard, and **Steven Bethard**. “[A Semantic Parsing Framework for End-to-End Time Normalization](#)”. In: *The Thirty-ninth Annual Conference on Neural Information Processing Systems* [h5-index: 371]. Dec. 2025.
54. Xin Su[⊙], Phillip Howard, and **Steven Bethard**. “[Transformer-Based Temporal Information Extraction and Application: A Review](#)”. In: *Proceedings of the 2025 Conference on Empirical Methods in Natural Language Processing* [h5-index: 218]. Ed. by Christos Christodoulopoulos, Tanmoy Chakraborty, Carolyn Rose, and Violet Peng. Nov. 2025, pp. 28810–28829.
55. Xin Su[⊙], Tiep Le, **Steven Bethard**, and Phillip Howard. “[Semi-Structured Chain-of-Thought: Integrating Multiple Sources of Knowledge for Improved Language Model Reasoning](#)”. In: *Proceedings of the 2024 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies (Volume 1: Long Papers)* [h5-index: 126]. June 2024, pp. 8597–8613.

56. Zeyu Zhang[⊙], Egoitz Laparra[⊙], and **Steven Bethard**. “Improving Toponym Resolution by Predicting Attributes to Constrain Geographical Ontology Entries”. In: *Proceedings of the 2024 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies (Volume 2: Short Papers)* [h5-index: 126]. June 2024, pp. 35–44.
57. Xin Su[⊙], Phillip Howard, Nagib Hakim, and **Steven Bethard**. “Fusing Temporal Graphs into Transformers for Time-Sensitive Question Answering”. In: *Findings of the Association for Computational Linguistics: EMNLP 2023*. Ed. by Houda Bouamor, Juan Pino, and Kalika Bali. Dec. 2023, pp. 948–966.
58. Lijing Wang, Yingya Li, Timothy Miller, **Steven Bethard**, and Guergana Savova. “Two-Stage Fine-Tuning for Improved Bias and Variance for Large Pretrained Language Models”. In: *Proceedings of the 61st Annual Meeting of the Association for Computational Linguistics (Volume 1: Long Papers)* [h5-index: 236]. July 2023, pp. 15746–15761.
59. Zeyu Zhang[⊙] and **Steven Bethard**. “Improving Toponym Resolution with Better Candidate Generation, Transformer-based Reranking, and Two-Stage Resolution”. In: *Proceedings of the The 12th Joint Conference on Lexical and Computational Semantics (*SEM 2023)* [h5-index: 20]. July 2023, pp. 48–60.
60. Xin Su[⊙], Yiyun Zhao[⊙], and **Steven Bethard**. “A Comparison of Strategies for Source-Free Domain Adaptation”. In: *Proceedings of the 60th Annual Meeting of the Association for Computational Linguistics (Volume 1: Long Papers)* [h5-index: 236]. May 2022, pp. 8352–8367.
61. Yiyun Zhao[⊙], Jian Gang Ngui, Lucy Hall Hartley, and **Steven Bethard**. “Do pretrained transformers infer telicity like humans?” In: *Proceedings of the 25th Conference on Computational Natural Language Learning* [h5-index: 30]. Nov. 2021, pp. 72–81.
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156. Tugay Bilgis[⊙], Nimet Beyza Bozdog[⊙], and **Steven Bethard**. “Gallagher at SemEval-2023 Task 5: Tackling Clickbait with Seq2Seq Models”. In: *Proceedings of the The 17th International Workshop on Semantic Evaluation (SemEval-2023)* [h5-index: 40]. July 2023, pp. 1650–1655.
157. Nimet Beyza Bozdog[⊙], Tugay Bilgis[⊙], and **Steven Bethard**. “Arizonans at SemEval-2023 Task 9: Multilingual Tweet Intimacy Analysis with XLM-T”. In: *Proceedings of the The 17th International Workshop on Semantic Evaluation (SemEval-2023)* [h5-index: 40]. July 2023, pp. 1656–1659.
158. Kadir Bulut Ozler[⊙] and **Steven Bethard**. “clulab at MEDIQA-Chat 2023: Summarization and classification of medical dialogues”. In: *Proceedings of the 5th Clinical Natural Language Processing Workshop*. July 2023, pp. 144–149.
159. John Culnan[⊙], Damian Romero Diaz[⊙], and **Steven Bethard**. “Exploring transformers and time lag features for predicting changes in mood over time”. In: *Proceedings of the Eighth Workshop on Computational Linguistics and Clinical Psychology*. July 2022, pp. 226–231.
160. Hyunju Song[⊙] and **Steven Bethard**. “UA-KO at SemEval-2022 Task 11: Data Augmentation and Ensembles for Korean Named Entity Recognition”. In: *Proceedings of the 16th International Workshop on Semantic Evaluation (SemEval-2022)* [h5-index: 40]. July 2022, pp. 1608–1612.
161. Nazia Tasnim, Md. Istiak Shihab, Asif Shahriyar Sushmit, **Steven Bethard**, and Farig Sadeque[⊙]. “TEAM-Atreides at SemEval-2022 Task 11: On leveraging data augmentation and ensemble to recognize complex Named Entities in Bangla”. In: *Proceedings of the 16th International Workshop on Semantic Evaluation (SemEval-2022)* [h5-index: 40]. July 2022, pp. 1524–1530.
162. Egoitz Laparra[⊙], Xin Su[⊙], Yiyun Zhao[⊙], Özlem Uzuner, Timothy Miller, and **Steven Bethard**. “SemEval-2021 Task 10: Source-Free Domain Adaptation for Semantic Processing”. In: *Proceedings of the 15th International Workshop on Semantic Evaluation (SemEval-2021)* [h5-index: 40]. Aug. 2021, pp. 348–356.

163. Xin Su[⊙], Yiyun Zhao[⊙], and **Steven Bethard**. “The University of Arizona at SemEval-2021 Task 10: Applying Self-training, Active Learning and Data Augmentation to Source-free Domain Adaptation”. In: *Proceedings of the 15th International Workshop on Semantic Evaluation (SemEval-2021)* [h5-index: 40]. Aug. 2021, pp. 458–466.
164. Moonsung Kim[⊙] and **Steven Bethard**. “TTUI at SemEval-2020 Task 11: Propaganda Detection with Transfer Learning and Ensembles”. In: *Proceedings of the Fourteenth Workshop on Semantic Evaluation* [h5-index: 40]. Dec. 2020, pp. 1829–1834.
165. Vikas Yadav[⊙], Egoitz Laparra[⊙], Ti-Tai Wang[⊙], Mihai Surdeanu, and **Steven Bethard**. “University of Arizona at SemEval-2019 Task 12: Deep-Affix Named Entity Recognition of Geolocation Entities”. In: *Proceedings of the 13th International Workshop on Semantic Evaluation* [h5-index: 40]. June 2019, pp. 1319–1323.
166. Egoitz Laparra[⊙], Dongfang Xu[⊙], Ahmed Elsayed, **Steven Bethard**, and Martha Palmer. “SemEval 2018 Task 6: Parsing Time Normalizations”. In: *Proceedings of The 12th International Workshop on Semantic Evaluation* [h5-index: 40]. June 2018, pp. 88–96.
167. Dongfang Xu[⊙], Vikas Yadav[⊙], and **Steven Bethard**. “UARizona at the MADE1.0 NLP Challenge”. In: *Proceedings of the 1st International Workshop on Medication and Adverse Drug Event Detection*. Ed. by Feifan Liu, Abhyuday Jagannatha, and Hong Yu. Vol. 90. Proceedings of Machine Learning Research. May 2018, pp. 57–65.
168. Farig Sadeque[⊙], Dongfang Xu[⊙], and **Steven Bethard**. “UARizona at the CLEF eRisk 2017 Pilot Task: Linear and Recurrent Models for Early Depression Detection”. In: *CEUR workshop proceedings: Working Notes of CLEF 2017 - Conference and Labs of the Evaluation Forum*. Sept. 2017.
169. **Steven Bethard**, Guergana Savova, Martha Palmer, and James Pustejovsky. “SemEval-2017 Task 12: Clinical TempEval”. In: *Proceedings of the 11th International Workshop on Semantic Evaluation (SemEval-2017)* [h5-index: 40]. Aug. 2017, pp. 565–572.
170. **Steven Bethard**, Guergana Savova, Wei-Te Chen, Leon Derczynski, James Pustejovsky, and Marc Verhagen. “SemEval-2016 Task 12: Clinical TempEval”. In: *Proceedings of the 10th International Workshop on Semantic Evaluation (SemEval-2016)* [h5-index: 40]. June 2016, pp. 1052–1062.
171. Nicolas Rey-Villamizar, Prasha Shrestha, Tamar Solorio, Farig Sadeque[⊙], **Steven Bethard**, and Ted Pedersen. “Semi-supervised CLPsych 2016 Shared Task System Submission”. In: *Proceedings of the Third Workshop on Computational Linguistics and Clinical Psychology*. June 2016, pp. 171–175.
172. **Steven Bethard**, Leon Derczynski, Guergana Savova, James Pustejovsky, and Marc Verhagen. “SemEval-2015 Task 6: Clinical TempEval”. In: *Proceedings of the 9th International Workshop on Semantic Evaluation (SemEval 2015)* [h5-index: 40]. June 2015, pp. 806–814.
173. James Gung, John Osborne[⊙], and **Steven Bethard**. “CUAB: Supervised Learning of Disorders and their Attributes using Relations”. In: *Proceedings of the 9th International Workshop on Semantic Evaluation (SemEval 2015)* [h5-index: 40]. June 2015, pp. 417–421.
174. Md Arafat Sultan, **Steven Bethard**, and Tamara Sumner. “DLS@CU: Sentence Similarity from Word Alignment and Semantic Vector Composition”. In: *Proceedings of the 9th International Workshop on Semantic Evaluation (SemEval 2015)* [h5-index: 40]. June 2015, pp. 148–153. Winner of the English shared task.

175. Tamar Solorio, Elizabeth Blair, Suraj Maharjan, **Steven Bethard**, Mona Diab, Mahmoud Ghoneim, Abdelati Hawwari, Fahad AlGhamdi, Julia Hirschberg, Alison Chang, and Pascale Fung. “[Overview for the First Shared Task on Language Identification in Code-Switched Data](#)”. In: *Proceedings of the First Workshop on Computational Approaches to Code Switching*. Oct. 2014, pp. 62–72.
176. Md Arafat Sultan, **Steven Bethard**, and Tamara Sumner. “[DLS@CU: Sentence Similarity from Word Alignment](#)”. In: *Proceedings of the 8th International Workshop on Semantic Evaluation (SemEval 2014)* h5-index: 40. Aug. 2014, pp. 241–246. Winner of the shared task.
177. **Steven Bethard**. “[ClearTK-TimeML: A minimalist approach to TempEval 2013](#)”. In: *Second Joint Conference on Lexical and Computational Semantics (*SEM), Volume 2: Proceedings of the Seventh International Workshop on Semantic Evaluation (SemEval 2013)* h5-index: 40. June 2013, pp. 10–14. Winner of the shared task.
178. Oleksandr Kolomiyets, Parisa Kordjamshidi, Marie-Francine Moens, and **Steven Bethard**. “[SemEval-2013 Task 3: Spatial Role Labeling](#)”. In: *Second Joint Conference on Lexical and Computational Semantics (*SEM), Volume 2: Proceedings of the Seventh International Workshop on Semantic Evaluation (SemEval 2013)* h5-index: 40. June 2013, pp. 255–262.
179. Ifeyinwa Okoye, **Steven Bethard**, and Tamara Sumner. “[CU: Computational Assessment of Short Free Text Answers - A Tool for Evaluating Students’ Understanding](#)”. In: *Second Joint Conference on Lexical and Computational Semantics (*SEM), Volume 2: Proceedings of the Seventh International Workshop on Semantic Evaluation (SemEval 2013)* h5-index: 40. June 2013, pp. 603–607.
180. Md. Arafat Sultan, **Steven Bethard**, and Tamara Sumner. “[DLS@CU-CORE: A Simple Machine Learning Model of Semantic Textual Similarity](#)”. In: *Second Joint Conference on Lexical and Computational Semantics (*SEM), Volume 1: Proceedings of the Main Conference and the Shared Task: Semantic Textual Similarity* h5-index: 20. June 2013, pp. 176–180.
181. Parisa Kordjamshidi, **Steven Bethard**, and Marie-Francine Moens. “[SemEval-2012 Task 3: Spatial Role Labeling](#)”. In: **SEM 2012: The First Joint Conference on Lexical and Computational Semantics – Proceedings of the Sixth International Workshop on Semantic Evaluation (SemEval 2012)* h5-index: 40. June 2012, pp. 365–373.
182. **Steven Bethard** and James H. Martin. ★“[CU-TMP: Temporal Relation Classification Using Syntactic and Semantic Features](#)”. In: *Proceedings of the Fourth International Workshop on Semantic Evaluations (SemEval-2007)* h5-index: 40. June 2007, pp. 129–132.

REFEREED DEMONSTRATION ARTICLES

183. Mihai Surdeanu, John Hungerford, Yee Seng Chan, Jessica MacBride, Benjamin Gyori, Andrew Zupon, Zheng Tang, Haoling Qiu, Bonan Min, Yan Zverev, Caitlin Hilverman, Max Thomas, Walter Andrews, Keith Alcock, Zeyu Zhang[⊙], Michael Reynolds, **Steven Bethard**, Rebecca Sharp, and Egoitz Laparra[⊙]. “[Taxonomy Builder: a Data-driven and User-centric Tool for Streamlining Taxonomy Construction](#)”. In: *Proceedings of the Second Workshop on Bridging Human–Computer Interaction and Natural Language Processing*. July 2022, pp. 1–10.

184. Rebecca Sharp, Adarsh Pyarelal, Benjamin Gyori, Keith Alcock, Egoitz Laparra[○], Marco A. Valenzuela-Escárcega, Ajay Nagesh, Vikas Yadav[○], John Bachman, Zheng Tang, Heather Lent, Fan Luo, Mithun Paul, **Steven Bethard**, Kobus Barnard, Clayton Morrison, and Mihai Surdeanu. “[Eidos, INDRA, & Delphi: From Free Text to Executable Causal Models](#)”. In: *Proceedings of the 2019 Conference of the North American Chapter of the Association for Computational Linguistics (Demonstrations)* h5-index: 126. June 2019, pp. 42–47.
185. Christopher Manning, Mihai Surdeanu, John Bauer, Jenny Finkel, **Steven Bethard**, and David McClosky. “[The Stanford CoreNLP Natural Language Processing Toolkit](#)”. In: *Proceedings of 52nd Annual Meeting of the Association for Computational Linguistics: System Demonstrations* h5-index: 236. June 2014, pp. 55–60.

TECHNICAL REPORTS

186. Kathy Baker, **Steven Bethard**, Michael Bloodgood, Ralf Brown, Chris Callison-Burch, Glen Copper-smith, Bonnie Dorr, Wes Filardo, Kendall Giles, Anni Irvine, Mike Kayser, Lori Levin, Justin Martineau, Jim Mayfield, Scott Miller, Aaron Phillips, Andrew Philpot, Christine Piatko, Lane Schwartz, and David Zajic. *Semantically Informed Machine Translation (SIMT)*. Tech. rep. Johns Hopkins University Human Language Technology Center of Excellence, Jan. 2010.

PREPRINTS

187. **Steven Bethard**. “[We need to talk about random seeds](#)”. arXiv, Oct. 2022.

THESIS

188. **Steven Bethard**. ★“[Finding Event, Temporal and Causal Structure in Text: A Machine Learning Approach](#)”. PhD thesis. University of Colorado at Boulder, Dec. 2007.

SCHOLARLY PRESENTATIONS

COLLOQUIA

- 13 Sep 2024 University of Illinois Urbana-Champaign: “Mapping Text to Structured Representations”
- 13 Feb 2024 University of Colorado Boulder: “Mapping Text to Structured Representations”
- 27 Jul 2022 University of Colorado Boulder: “Adapting machine learning models for clinical language processing”
- 20 Jun 2022 University of Arizona (CS): “Adapting machine learning models for clinical language processing”
- 26 Feb 2021 University of Alabama at Birmingham: “Adapting natural language processing models across clinical domains”
- 6 Apr 2018 University of Arizona (CogSci): “Teaching Computers the Language of Time”
- 16 Mar 2018 University of Arizona (MIS): “Parsing the Language of Time”
- 22 Apr 2016 University of Arizona (iSchool): “Parsing the Language of Time”
- 28 Mar 2016 University of Southern Mississippi: “Parsing the Language of Time”
- 3 Mar 2016 University of South Alabama: “Parsing the Language of Time”
- 9 Feb 2016 University of Colorado Boulder: “Parsing the Language of Time”
- 21 Jan 2016 University of California Davis: “Parsing the Language of Time”
- 18 Mar 2015 Northeastern University: “Extracting Timelines from Unstructured Text”
- 20 Feb 2015 Tufts University: “Extracting Timelines from Unstructured Text”

- 9 Jul 2014 i2b2 Academic Users' Group Annual Meeting: "State of the Art in Timeline Extraction"
- 18 Jun 2012 University of Arizona: "Extracting Timelines from Unstructured Text"
- 7 Mar 2012 Radboud University Nijmegen: "Extracting Timelines from Unstructured Text"
- 3 Feb 2012 University of Chicago: "Extracting Timelines from Unstructured Text"
- 27 Jan 2012 Indiana University: "Extracting Timelines from Unstructured Text"
- 14 Jan 2011 University of Arizona: "Exploring ERP effects of metaphor via crowdsourcing"
- 15 Jul 2008 Johns Hopkins University: "Extracting event structure: building models and corpora"
- 12 Jun 2008 University of Pittsburgh: "Building corpora to support the semantic analysis of text"
- 9 Feb 2007 Western State College: "Meaning from Text: Teaching Computers to Read"
- 26 Feb 2007 University of Texas at Dallas: "Timelines from Text: Research and Resources"
- 6 Apr 2010 Xerox-PARC: "Learning the Temporal Ordering of Textual Events"
- 1 Jun 2010 NSF workshop on Chinese temporal and discourse annotation: "Mechanical Turk and Web Counts: Collecting and Using Distributional Information about Event Durations"

CONFERENCES

- 10 Dec 2022 2022 Conference on Empirical Methods in Natural Language Processing, Birds of a Feather session: "We need to talk about random seeds"
- 16 Feb 2019 2019 Annual Meeting of the American Association for the Advancement of Science (AAAS-2019), Machine Learning and Human Language scientific session: "Human Annotation and Machine Learning in Understanding the Language of Time"
- 5 Nov 2016 2016 Conference on Empirical Methods in Natural Language Processing (EMNLP-2016) Workshop on Uphill Battles in Language Processing: "Visualizing the Content of a Children's Story in a Virtual World: Lessons Learned"
- 16 Jun 2016 10th International Workshop on Semantic Evaluation (SemEval-2016): "SemEval-2016 Task 12: Clinical TempEval"
- 5 Jun 2015 9th International Workshop on Semantic Evaluation (SemEval-2015): "SemEval-2015 Task 6: Clinical TempEval"
- 4 Jun 2015 9th International Workshop on Semantic Evaluation (SemEval-2015): "CUAB: Supervised Learning of Disorders and their Attributes using Relations"
- 29 May 2014 Ninth International Conference on Language Resources and Evaluation (LREC 2014): "ClearTK 2.0: Design Patterns for Machine Learning in UIMA"
- 19 Oct 2013 Conference on Empirical Methods in Natural Language Processing (EMNLP 2013): "A Synchronous Context Free Grammar for Time Normalization"
- 14 Jun 2013 7th International Workshop on Semantic Evaluation (SemEval-2013): "ClearTK-TimeML: A minimalist approach to TempEval 2013"
- 24 May 2012 Eighth International Conference on Language Resources and Evaluation (LREC 2012): "Annotating Story Timelines as Temporal Dependency Structures"
- 6 Jun 2012 NAACL 2010 Workshop on Creating Speech and Language Data with Amazon's Mechanical Turk: "Crowdsourcing and language studies: the new generation of linguistic data"
- 17 Jun 2009 Joint Conference on Digital Libraries (JCDL 2009): "Automatically characterizing resource quality for educational digital libraries"
- 16 Jun 2009 Joint Conference on Digital Libraries (JCDL 2009): "Topic Model Methods for Automatically Identifying Out-of-Scope Resources"
- 4 Jun 2009 NAACL-HLT 2009 Workshop on Computational Approaches to Linguistic Creativity (CALC-09): "Topic Model Analysis of Metaphor Frequency for Psycholinguistic Stimuli"
- 17 Jun 2008 46th Annual Meeting of the Association for Computational Linguistics: "Learning Semantic

- Links from a Corpus of Parallel Temporal and Causal Relations”
- 28 May 2008 Sixth International Conference on Language Resources and Evaluation (LREC 2008): “Building a Corpus of Temporal-Causal Structure”
- 17 Sep 2007 First IEEE International Conference on Semantic Computing (ICSC 2007) “Timelines from Text: Identification of Syntactic Temporal Relations”
- 24 Jun 2007 Fourth International Workshop on Semantic Evaluations (SemEval-2007): “CU-TMP: Temporal Relation Classification Using Syntactic and Semantic Features”
- 26 Mar 2007 AAAI Spring Symposium on Machine Reading: “Semantic integration in learning from text”
- 22 Jul 2006 Empirical Methods in Natural Language Processing (EMNLP 2006): “Identification of Event Mentions and their Semantic Class”
- 22 Mar 2004 AAAI Spring Symposium on Exploring Attitude and Affect in Text: “Automatic extraction of opinion propositions and their holders”

AWARDED GRANTS AND CONTRACTS

FEDERAL

- 2022-08 – 2025-07 \$574,654 PI: Lai US National Science Foundation, BCS
[Learning science concepts through metaphor comprehension, production, and conversation: Behavioral, neural and artificial intelligence measures](#)
 Role: Co-PI
- 2016-01 – 2025-05 \$3,500,000 PI: Savova, Bethard US National Institutes of Health, BD2K R01
[Extended Methods and Software Development for Health NLP](#)
 Role: PI
- 2010-09 – 2023-05 \$6,500,000 PI: Savova US National Institutes of Health, NLM, R01
[Temporal Relation Discovery for Clinical Text](#)
 Role: Site PI
- 2018-09 – 2022-08 \$1,500,000 PI: López-Hoffman US National Science Foundation, SBE, SMA
[A Data Science Platform and Mechanisms for Its Sustainability](#)
 Role: Co-PI
- 2021-01 – 2022-12 \$400,000 PI: Crane, Bethard US National Institutes of Health, NLM, R01
[Using natural language processing to determine predictors of healthy diet and physical activity behavior change in ovarian cancer survivors](#)
 Role: PI
- 2018-09 – 2022-07 \$1,100,000 PI: Miller US National Institutes of Health, NLM, R01
[Automated Domain Adaptation for Clinical Natural Language Processing](#)
 Role: Site PI
- 2017-12 – 2022-07 \$4,500,000 PI: Surdeanu Defense Advanced Research Projects Agency
[GRASP: Global Reading and Assembly for Semantic, Probabilistic World Models](#)
 Role: Co-PI
- 2021-03 – 2022-06 \$750,000 PI: RedShred, LLC Air Force
[VADER: Voice Assistant for Data Entry and Recording](#)
 Role: Site PI
- 2013-03 – 2014-01 \$19,000 PI: Bethard US National Science Foundation, CISE, IIS
[ACL 2013 Student Research Workshop](#)
 Role: Principal Investigator

2012-09 – 2015-11	€1,993,326	PI: Moens	EU FP7 ICT FET-Open
			Machine Understanding for Interactive Storytelling
		Role: Co-PI	
2007-09 – 2008-09	\$138,213	PI: Martin	US National Science Foundation, CISE, IIS
			SGER: Relevance Models for Digital Repository Management
		Role: Senior Personnel	
2006-08 – 2006-12	\$10,000		US Department of Homeland Security
			<i>Dissertation Grant Award</i>
2003-08 – 2006-08	\$82,800 plus tuition		US Department of Homeland Security
			<i>Graduate Fellowship</i>

INSTITUTIONAL

2015-11 – 2017-11	\$132,557	PI: Wells	University of Alabama Health Services Foundation
			Natural Language Processing to Identify COPD Exacerbations in Real Time
		Role: Co-Investigator	

MENTORING

POSTDOCTORAL: ADVISOR

1. Egoitz Laparra, School of Information, University of Arizona, 2017-2025
2. John Culnan, School of Information, University of Arizona, 2022
3. Cynthia M Kroeger, Nutrition Obesity Research Center, University of Alabama at Birmingham, 2015-2016
NIH F32 “Research-reporting fidelity within dietary weight-loss supplement literature”

POSTDOCTORAL: MEMBER OF COMMITTEE

1. Jiarui Yao, Computational Health Informatics Program, Boston Children’s Hospital, 2022
2. Lizhou Fan, Computational Health Informatics Program, Boston Children’s Hospital, 2024

DOCTORAL: ADVISOR

1. Yanyan Dong, Ph.D., Information Science, University of Arizona, expected 2028
2. Ayesha Khatun, Ph.D., Information Science, University of Arizona, expected 2027
3. Yaeun Kwon, Ph.D., Information Science, University of Arizona, expected 2027
4. Jiacheng Zhang, Ph.D., Information Science, University of Arizona, expected 2027
5. Kadir Bulut Ozler, Ph.D., Information Science, University of Arizona, expected 2026
6. Sarah Stueve, Ph.D., Information Science, University of Arizona, expected 2026
7. Xin Su, Ph.D., Information, University of Arizona, 2024
Dissertation: [Structured Information Extraction and Applications in Complex Reasoning](#)
8. Zeyu Zhang, Ph.D., Information, University of Arizona, 2023
Dissertation: [Improving Geocoding by Incorporating Geographical Hierarchy and Attributes Into Transformer Networks](#)
9. Yiyun Zhao, Ph.D., Linguistics, University of Arizona, 2022
Dissertation: [How to probe linguistic knowledge and bias](#)
10. Dongfang Xu, Ph.D., Information, University of Arizona, 2021
Dissertation: [Neural Network Algorithms for Ontology Informed Information Extraction](#)
11. Vikas Yadav, Ph.D., Information, University of Arizona, 2020
Dissertation: [Evidence Retrieval for Explainable Question Answering](#)

12. Farig Sadeque, Ph.D., Information, University of Arizona, 2019
Dissertation: [User behavior in social media: engagement, incivility, and depression](#)
13. John Osborne, Ph.D., Computer and Information Sciences, U. of Alabama at Birmingham, 2016
Dissertation: [Machine Learning of Composite Concepts and the Alleviation of The Content Completeness Problem in Text Mention Normalization](#)
14. Upendra Sapkota, Ph.D., Computer and Information Sciences, U. of Alabama at Birmingham, 2015
Dissertation: [Improving the performance of cross-domain authorship attribution](#)

DOCTORAL: CO-ADVISOR

1. Rongbing Xie, Ph.D., Public Health, University of Alabama at Birmingham, 2017
Thesis: *Modeling depression treatment strategies for human immunodeficiency virus (HIV) positive patients*
2. Quynh Thi Ngoc Do, Ph.D., Computer Science, KU Leuven, 2017
Thesis: *Domain adaptation in natural language processing for visualizing a children's story in a virtual world*

DOCTORAL: MEMBER OF DISSERTATION COMMITTEE

1. Manoj Gopale, Ph.D., Electrical and Computer Engineering, University of Arizona, 2025
Dissertation: *Advances in Breaking AES Encryption using Power-based Side Channels and Machine Learning*
2. Sarah Pungitore, Ph.D., Applied Mathematics, University of Arizona, 2025
Dissertation: *Next-Generation Computational Phenotyping with Large Language Models*
3. Ruoyao Wang, Ph.D., Information, University of Arizona, 2025
Dissertation: *Text-based Simulation for Scientific Reasoning*
4. Shahriar Golchin, Ph.D., Computer Science, University of Arizona, 2024
Dissertation: *Data Contamination in Large Language Models*
5. Reza Ehsani, Ph.D., Hydrology, University of Arizona, 2023
Dissertation: *Improving Global Satellite Remote Sensing Precipitation Products Utilizing Machine Learning*
6. Eunsung Yoon, Ph.D., Sociology, University of Arizona, 2023
Dissertation: *The Influence of Competitors on Decision Making: Comparative Studies of Reference Groups*
7. Zhengzhong Liang, Ph.D., Computer Science, University of Arizona, 2023
Dissertation: *Explainable Multi-Step Reasoning Over Natural Language*
8. Ariyan Zarei, Ph.D., Computer Science, University of Arizona, 2023
Dissertation: *Advancements In 2D And 3D Computer Vision Driven By Domain Science Challenges And Data*
9. Hoang Van, Ph.D., Computer Science, University of Arizona, 2022
Dissertation: *Mitigating Data Scarcity For Neural Language Models*
10. Georgios Michalopoulos, Ph.D., Computer Science, University of Waterloo, 2022
Dissertation: *Innovations in Domain Knowledge Augmentation of Contextual Models*
11. Farhad Akhbardeh, Ph.D., Computing and Information Sciences, Rochester Institute of Technology, 2022
Dissertation: *NLP and ML Methods for Pre-processing, Clustering and Classification of Technical Logbook Datasets*
12. Mohammad Abdolhosseini Moghaddam, Ph.D., Hydrology, University of Arizona, 2020
Dissertation: *Application and Limitation of Deep Learning Algorithms to Hydrogeology – Data Driven*

- Approaches to Understanding Effective Hydraulic Conductivity, Flux, and Monitoring Network Design*
13. Gretchen Stahlman, Ph.D., Information, University of Arizona, 2019
Dissertation: *Exploring the Long Tail of Astronomy: A Mixed-Methods Approach to Searching for Dark Data*
 14. Ligaj Pradhan, Ph.D., Computer Science, University of Alabama at Birmingham, 2017
Dissertation: *Enhancing Collaborative Filtering-based Rating-Prediction by Discovering and Incorporating User Concerns from User Reviews*
 15. Paramita Mirza, Ph.D., Information and Communication Technologies, University of Trento, 2016
Dissertation: *Extracting Temporal and Causal Relations between Events*
 16. Md. Arafat Sultan, Ph.D., Computer Science, University of Colorado Boulder, 2016
Dissertation: *Short-Text Semantic Similarity: Algorithms and Applications*
 17. Reed Milewicz, Ph.D., Computer Science, University of Alabama at Birmingham, 2016
Dissertation: *Improving the scalability of directed model checking of concurrent java code through hybrid and distributed analysis*
 18. Samuel González López, Ph.D., Computer Science, I. N. de Astrofísica, Óptica y Electrónica, Mexico, 2015
Dissertation: *Linguistic Analysis of Research Drafts of Undergraduate Students*
 19. Ifeyinwa Okoye, Ph.D., Computer Science, University of Colorado Boulder, 2013
Dissertation: *Applying the theory of conceptual change to improve students' understanding of science concepts with an educational recommender system*
 20. Oleksandr Kolomiyets, Ph.D., Computer Science, KU Leuven, 2012
Dissertation: *Algorithms for Temporal Information Processing of Text and their Applications*
 21. Raquel Mochales Palau, Ph.D., Computer Science, KU Leuven, 2011
Dissertation: *Automatic Detection and Classification of Argumentation in a Legal Case*

DOCTORAL: MEMBER OF COMPREHENSIVE EXAM COMMITTEE

1. Tim Mo, Statistics and Data Science, University of Arizona, Fall 2025
2. Ali Mostafavi, Mechanical Engineering, University of Arizona, Fall 2025
3. Wenting Luo, Statistics and Data Science, University of Arizona, Fall 2025
4. Deepshana Shahi, Information, University of Arizona, Spring 2025
5. Gaurav Sharma, Information, University of Arizona, Spring 2025
6. Shashank Yadav, Biomedical Engineering, University of Arizona, Fall 2024
7. Reina Mendoza, Psychology, University of Arizona, Fall 2024
8. Salena Ashton, Information, University of Arizona, Spring 2024
9. Maria Alexeeva Zupon, Linguistics, University of Arizona, Spring 2022
10. Loren Champlin, Information, University of Arizona, Fall 2021

DOCTORAL: RESEARCH PROJECT MENTOR

1. Yaeun Kwon, University of Arizona, 2024
2. Ruoyao Wang, University of Arizona, 2023-2024
3. Gaurav Sharma, University of Arizona, 2023-2024
4. Damian Romero-Diaz, University of Arizona, 2021
5. Loren Champlin, University of Arizona, 2021
6. Manoj Gopale, University of Arizona, 2019

MASTERS: ADVISOR

1. Sarah Hyunju Song, M.S., Computer Science, University of Arizona, 2024
Thesis: [Metadata Enhancement Using Large Language Models: Improving the Quality of Aggregated Records in the iSamples Project](#)
2. Jiacheng Zhang, M.S., Computer Science, University of Arizona, 2021
Thesis: [General Benefits of Monolingual Pre-training in Transformers](#)

MASTERS: CO-ADVISOR

1. Bram Jans, M.S., Computer Science, KU Leuven, 2011
Thesis: *Construction and evaluation of databases of narrative event chains*
2. Saurabh Shekhar Verma, M.S., Artificial Intelligence, KU Leuven, 2011
Thesis: *Identification and Classification of Temporally Relevant Events in Text*
3. Carine Yu, M.S., Artificial Intelligence, KU Leuven, 2011
Thesis: *The Bedtime Story Generator*

MASTERS: MEMBER OF COMMITTEE

1. Lindsay Krebs, M.S., Psychology, University of Arizona, 2024
Thesis: *Metaphor production and science concept learning in high-school-aged students*
2. Ashley Stava, M.S., Natural Resources Management and Policy, University of Arizona, 2023
Thesis: *The Impact of Public Comments: A Quantitative Study of Public Engagement in the NEPA Process*
3. Marko Kreso, M.S., Computer Science, University of Arizona, 2022
Thesis: *Improving Extractive Summaries through Abstractive Transformers*
4. Sina Ehansi, M.S., Computer Science, University of Arizona, 2022
Thesis: *OD-TQA: On-Demand Visual Augmentation for Textual Question Answering Task*
5. Maria Alexeeva Zupon, M.S., Human Language Technology, University of Arizona, 2019
Internship with Crane AI
6. Amaris Le Fay, M.S., Human Language Technology, University of Arizona, 2019
Internship with Valueinnova
7. John Blazic, M.S., Human Language Technology, University of Arizona, 2018
Internship with PitchVantage
8. Ralph Frank McSweeney IV, M.S., Computer and Information Sciences, U. of Alabama at Birmingham, 2015
Thesis: *Malware Detection through Disassembled Function Analysis*

MASTERS: RESEARCH PROJECT MENTOR

1. Shreemithra Naveen, University of Arizona, 2025
2. Sai Laasya Gorantla, University of Arizona, 2025
3. Siva Rohit Kondapaneni, University of Arizona, 2025
4. Yanyan Dong, University of Arizona, 2024
5. Hinoki Crum, University of Arizona, 2023
6. Kyle Arechiga, University of Arizona, 2023
7. Yuehting Wu, University of Arizona, 2022
8. Maria Alexeeva Zupon, University of Arizona, 2022
9. Riah Coulter, University of Arizona, 2021
10. Peiwen Su, University of Arizona, 2021

11. Wenmo Sun, University of Arizona, 2021
12. Zhengnan Xie, University of Arizona, 2021
13. Yawen Chen, University of Arizona, 2020
14. Ragheb Al-Ghezi, University of Arizona, 2019
15. Ti-Tai Wang, University of Arizona, 2019
16. Xiaoxiao Chen, University of Arizona, 2019
17. Moonsung Kim, University of Arizona, 2019

UNDERGRADUATE: ADVISOR

1. Abhyuday Singh, B.S., Computer Science, University of Arizona, 2025
Honors Thesis: *Comparing Pretrained Llms Across Transformer, State-Space And Hybrid Architectures*
2. Tugay Bilgis, B.S., Computer Science, University of Arizona, 2024
Honors Thesis: *Revisiting Medical Concept Normalization: a Comparative Analysis of Transformer-based Models and Search Engine Approaches*
3. Winston Zeng, B.S., Computer Science, University of Arizona, 2023
Honors Thesis: *Fine-tuning Transformer-based Natural Language Generation Algorithms for USDA Grains Reports for Farmers, Producers, and Small Businesses*
4. Amanda Bertsch, B.S., Computer Science, University of Arizona, 2021
Honors Thesis: *Detection of Puffery on the English Wikipedia*

UNDERGRADUATE: RESEARCH PROJECT MENTOR

1. Minglai Wang, University of Arizona, 2025
2. Hyungji Kim, University of Arizona, 2025
3. Abhyuday Singh, University of Arizona, 2023-2024
4. Reza Sanayei, University of Arizona, 2023-2024
5. MohammadHossein Rezaei, University of Arizona, 2023-2024
6. Nimet Beyza Bozdog, University of Arizona, 2022-2024
7. Tugay Bilgis, University of Arizona, 2022-2023
8. Taoseef Aziz, University of Arizona, 2022
9. Elijah Acuña, University of Arizona, 2021
10. Sarah Hyunju Song, University of Arizona, 2021
11. Winston Zeng, University of Arizona, 2020
12. Sophia Wang, University of Arizona, 2018-2019
13. Isaac Gonzalo Manrique, University of Arizona, 2017
14. Andrew Markley, University of Alabama at Birmingham, 2016
15. Jonathan Parker, University of Alabama at Birmingham, 2015-2016
16. Colin Hartmann, University of Alabama at Birmingham, 2015-2016

COURSES TAUGHT

2025-Fa Instructor	ISTA 457 / INFO 557: Neural Networks	6 undergrad 41 grad
2023-Fa Instructor	ISTA 457 / INFO 557: Neural Networks	25 undergrad 56 grad
2022-Fa Instructor	ISTA 457 / INFO 557: Neural Networks	20 undergrad 41 grad
2022-Sp Instructor	INFO 507: Information Research Methods	15 grad
2021-Fa Instructor	ISTA 457 / INFO 557: Neural Networks	16 undergrad 30 grad
2021-Sp Instructor	INFO 507: Information Research Methods	24 grad
2020-Fa Instructor	ISTA 457 / INFO 557: Neural Networks	10 undergrad 37 grad

2019-Fa	Instructor	ISTA 457 / INFO 557: Neural Networks	9 undergrad	47 grad
2019-Sp	Instructor	LING 439/539: Statistical Natural Language Processing	13 undergrad	31 grad
2018-Fa	Instructor	ISTA 457 / INFO 557: Neural Networks	10 undergrad	21 grad
2018-Sp	Instructor	ISTA 457 / INFO 557: Neural Networks	8 undergrad	26 grad
2017-Sp	Instructor	ISTA 116: Statistical Foundations for the Information Age	64 undergrad	
2016-Fa	Instructor	ISTA 116: Statistical Foundations for the Information Age	59 undergrad	
2016-Sp	Instructor	CS 460/660/760: Artificial Intelligence	12 undergrad	9 grad
2015-Fa	Instructor	CS 201: Introduction to Programming	48 undergrad	
2015-Fa	Instructor	CS 499: Senior Capstone	25 undergrad	
2015-Sp	Instructor	CS 460/660/760: Artificial Intelligence	9 undergrad	19 grad
2014-Fa	Instructor	CS 201: Introduction to Programming	63 undergrad	
2014-Fa	Instructor	CS 499: Senior Capstone	16 undergrad	
2014-Sp	Instructor	CS 460/660/760: Artificial Intelligence	4 undergrad	24 grad
2013-Fa	Instructor	CS 499: Senior Capstone	5 undergrad	
2008-Fa	Instructor	CSCI 3202: Introduction to Artificial Intelligence	57 undergrad	
2002-Sp	Section Leader	CSC 345: Analysis of Discrete Structures	20 undergrad	
2001-Fa	Section Leader	CSC 245: Introduction to Discrete Structures	20 undergrad	
2001-Sp	Section Leader	CSC 335: Object-Oriented Programming and Design	20 undergrad	
2000-Fa	Section Leader	CSC 227: Program Design and Development	20 undergrad	
2000-Sp	Section Leader	CSC 127a: Introduction to Computer Science	20 undergrad	

GUEST LECTURES

- 06 Apr 2023 “Adapting machine learning models for clinical language processing” in INFO 507: Information Research Methods
- 12 Oct 2022 “Neural Networks” in NSCS 320: Issues and Themes in Cognitive Science
- 03 Sep 2020 “Neural Networks” in NSCS 320: Issues and Themes in Cognitive Science
- 21 Oct 2019 “Neural Networks” in INFO 507: Information Research Methods
- 30 Aug 2018 “Neural Networks” in NSCS 320: Issues and Themes in Cognitive Science