ELIZABETH SPAULDING

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EDUCATION

University of Colorado Boulder *(Current)*
Ph.D. in Computer Science
Advisor: James H. Martin

University of Nebraska-Lincoln *May 2019*
B.S. in Mathematics GPA: 4.0/4.0
Minors in Computer Science, Spanish

RESEARCH AND INDUSTRY EXPERIENCE

Ph.D. Thesis
The meaning of agency and patiency to machines and people. *April 2025*

My dissertation focused on using linguistic theory as a lens to understand how language models represent meaning, and to what extent theories of meaning based on human speech and writing hold true in models that learn language statistically.

- Planned and executed fine-tuning and prompting experiments on language models such as GPT-4, Llama, OLMo, and BERT, using a broad swath of tools, including the OpenAI API, Huggingface transformers, Pytorch Lightning, and Langchain (publications [1] and [3]).
- Demonstrated the feasibility of applying semantic proto-role labeling to computational social science questions by analyzing human-written corpora for patterns of agency and patiency (submitted for anonymous peer review May 2025).

Graduate Research Assistant University of Colorado Boulder
DARPA KAIROS Project *December 2022 - May 2024*

AIDA and KAIROS were ambitious multi-university DARPA projects centered around extracting and clustering events from news articles and creating knowledge graphs to synthesize and visualize competing narratives in the news.

- Designed, built, and maintained an ontology for explainable, scalable event extraction from newstext
- Led a diverse, geographically-distributed team of seven researchers, including faculty, industry scientists, and graduate students, on two peer-reviewed publications ([2] and [4]) on the design of ontological frameworks for explainable NLP
- Led a junior graduate student in developing similarity metrics for instantiated event structures extracted from newstext

CTO Intern Bloomberg, L.P.
Joint End-to-end Semantic Proto-role Labeling *June 2022 - December 2022*

- Designed, built, and evaluated a fine-tuned language model using Pytorch Lightning, HuggingFace transformers, and Bloomberg's in-house deep learning infrastructure
- The end-to-end semantic proto-role labeling pipeline I developed either met or surpassed previous state-of-the-art models that were *not* end-to-end
- Published novel research at ACL [1] with a system demonstrating that a BERT encoder is capable of achieving state-of-the-art results on several pipeline tasks in one forward pass

Graduate Research Assistant University of Colorado Boulder
DARPA AIDA Project *June 2020 - December 2022*

- Developed event matching code in Java for team's entity and event clustering pipeline
- Facilitated transition from DARPA's manually-created program ontology to the Wikidata ontology

- Annotated news documents containing claims in the domain of COVID-19 to support automated claim extraction

Software Engineer Intern Atilika
Word Replace *June 2021 - August 2021*

- Developed a Chrome extension to be integrated into the company's Japanese language learning software, japanese.io
- Designed algorithm to locate English vocabulary words in sentences on webpages and replace them with their Japanese counterparts, using multilingual sentence embeddings for sense disambiguation
- Created the software prototype using Javascript and Python

TECHNICAL SKILLS

Languages & Tools:	Python, C++, Java, JavaScript, R, PyTorch, HuggingFace, Langchain, Tensorflow, TensorBoard, scikit-learn, NumPy, Pandas, spaCy, NLTK, Git
Methods:	Deep learning, neural networks, large language models, clustering, regression, classification, data wrangling, predictive models, knowledge graphs

CLASSES TAUGHT

CSCI 5832, Natural Language Processing, CU Boulder, TA, *S24, F24, Su24, F21*
CSCI 2824, Discrete Structures, CU Boulder, Instructor, *Su23*
CSCI 1300, Starting Computing (C++), CU Boulder, Lead TA, *F19, F20, S21*
CSCI 2270, Data Structures (C++), CU Boulder, TA, *S20*

PUBLICATIONS

[1] **Elizabeth Spaulding**, Shaffiudin Rehan Ahmed, James Martin. 2025. On the Role of Semantic Proto-roles in Semantic Analysis: What do LLMs know about agency? Forthcoming in *Proceedings of the 63rd Annual Meeting of the Association for Computational Linguistics (Findings)*, Vienna, Austria. Association for Computational Linguistics.

[2] **Elizabeth Spaulding**, Kathryn Conger, Anatole Gershman, Mahir Morshed, Susan Windisch Brown, James Pustejovsky, Rosario Uceda-Sosa, Sijia Ge and Martha Palmer. 2024. PropBank goes Public: Incorporation into Wikidata. In *Proceedings of the 18th Linguistic Annotation Workshop (LAW-XVIII)*, St. Julians, Malta. European Association for Computational Linguistics.

[3] **Elizabeth Spaulding**, Gary Kazantsev, and Mark Dredze. 2023. Joint End-to-end Semantic Proto-role Labeling. In *Proceedings of the 61st Annual Meeting of the Association for Computational Linguistics (Volume 2: Short Papers)*, pages 723 - 736, Toronto, Canada. Association for Computational Linguistics.

[4] **Elizabeth Spaulding**, Kathryn Conger, Anatole Gershman, Rosario Uceda-Sosa, Susan Windisch Brown, James Pustejovsky, Peter Anick, and Martha Palmer. 2023, June 20. The DARPA Wikidata Overlay: Wikidata as an ontology for natural language processing. In *Proceedings of the 15th International Conference on Computational Semantics (ICWS).* The 2023 Joint ACL - ISO Workshop on Interoperable Semantic Annotation, Nancy, France.

[5] Sarah Beemer, Zak Boston, April Bukoski, Daniel Chen, Princess Dickens, Andrew Gerlach, Torin Hopkins, Parth Anand Jawale, Chris Koski, Akanksha Malhotra, Piyush Mishra, Saliha Muradoglu, Lan Sang, Tyler Short, Sagarika Shreevastava, **Elizabeth Spaulding**, Testumichi Umada, Beilei Xiang, Changbing Yang, and Mans Hulden. 2020. Linguist vs. Machine: Rapid Development of Finite-State Morphological Grammars. In *Proceedings of the 17th SIGMORPHON Workshop on Computational Research in Phonetics, Phonology, and Morphology*, pages 162170, Online. Association for Computational Linguistics.

AWARDS & LEADERSHIP

Summer Graduate School Fellowship (2024)
Nelson A. Prager Family and J. H. Martin Endowed Grad Fellowship (2023)
CU Boulder CS Pedagogy Committee Grad Student Representative (2023 – 2025)

Lead Graduate Student Fellowship (2022)
David T. Spalding Graduate Teaching Fund Fellowship (2022)
CU Boulder Center for Teaching & Learning (CTL) Lead TA (2022 – 2024)
Dean's Summer Research Fellowship (2020)
University of Nebraska Regents Scholarship (2015)