Kevin Stowe | Curriculum Vitae

817 17th Street, Unit 3002, Denver, Colorado, 80202

+1 517 648 8953 • kevincstowe@gmail.com
kevincstowe.github.io

I'm a doctoral candidate in the Department of Linguistics, pursing a joint degree in Linguistics and Computer Science, focused on Natural Language Processing (NLP). My research is primarily in automatic metaphor detection, semantic processing, and machine learning. I am fascinated by the variety of language utterances people produce and understand, and my work tends to deal with the computational frameworks necessary to handle these novelties. My dissertation research is on how to better represent syntactic information for automatic detection and interpretation of metaphors. I've employed novel methods for improving training data based on linguistic analysis, and improved the performance of state-of-the-art systems for multiple metaphor tasks.

I have also worked extensively with professor Leysia Palen in the Department of Computer Science, applying NLP technology to the understanding of social media data produced during natural disasters. We worked with the National Center for Atmospheric Research to use modern computational methods to understand social media responses and reactions to natural disasters. This work culminated in the production of annotation schema and machine learning techniques, employing NLP methods to better identify vulnerable populations, assess their risk, and analyze their decision making behavior.

I successfully advanced to candidacy by defending my dissertation proposal, *Leveraging Syntax for Automatic Metaphor Processing*, in May of 2018 and plan on defending my dissertation in July of 2019.

Technical skills

- **Programming Languages:** Proficient in Python and Java, with some experience in C++, Ruby, R, PHP, and SQL. Also web development experience with HTML, CSS, Javascript and PHP.
- **Natural Language Processing:** Extensive experience with machine learning and NLP toolkits, including SciKit-Learn, ClearNLP, Stanford Core NLP, Gensim, PyTorch and Keras. Familiar with a variety of NLP tasks, including sentiment analysis, named entity tagging, and word-sense disambiguation.
- **Linguistic Background:** Traditional background in phonetics, phonology, morphology, syntax, and semantics. My primary interests are in lexical semantics, pragmatics, formal logic, and metaphor interpretation.
- **Management Background:** I've managed a variety of annotation projects, including behavioral annotation of Twitter data and word sense annotation, using Excel as well as custom in-house tools.

Education

Current.....

- **University of Colorado, Boulder** **Boulder, Colorado**
  PhD Student, Linguistics, joint degree in Cognitive Science. Advisor : Martha Palmer *2013–Present*
  Doctoral Candidate pursing a joint degree in Linguistics and Computer Science through the Institute of Cognitive Science (ICS).

Main CS Coursework	**Main Ling Courswork**
Machine Learning	Computational Lexical Semantics
Fundamentals of Programming Languages	Construction Grammar
Natural Langauge Processing	Computational Phonology
User-Centered Design	Semantics and Pragmatics
Computation for Research	Phonology, Morphology, Syntax

Previous.....

- **Indiana University** **Bloomington, Indiana**
  MA, Linguistics *2009–2011*
  Coursework in corpus linguistics, computational approaches to syntax, discrete mathematics and natural language processing.
- **Michigan State University** **East Lansing, Michigan**
  BA, Linguistics *2004–2009*
  Coursework included core linguistics, advanced semantics and pragmatics, and German and Russian languages.

Research Projects

- **Dissertation : Computational Approaches to Metaphor and Syntax**
  adv: Martha Palmer & Jim Martin

  My doctoral dissertation for the University of Colorado is focused on using syntactic features coupled with deep learning to improve automatic metaphor detection. Drawing from evidence that metaphoric meaning can often be derived via syntactic features like argument structure, I've employed information from syntactic parses and lexical resources to improve deep learning models. Through a variety of strategies including improving training data and embeddings models, I've improved the performance of state-of-the-art models on multiple metaphor detection tasks. I hope to continue to work on balancing linguistic analysis and deep learning to continue to improve state-of-the-art methods for figurative language.
- **Computational Language and Education Research Lab (CLEAR)**
  adv: Martha Palmer

  I work with Professor Martha Palmer on a variety of computational lexical resources, including VerbNet and PropBank. My responsibilities include ensuring compatability with outside resources, implementation of new infrastructure, developing interface tools for other researchers, and improving the accuracy, consistency, and coverage of the resources. Our current work involves linking VerbNet with the Generative Lexicon and improving consistency among semantic predicates, and improving automatic classification with better annotation.

  For more, see https://verbs.colorado.edu/verbnet/
- **Communicating Hazard Information in the Modern Environment (CHIME)**
  adv: Leysia Palen

  I also worked with the Empowering the Public with Information in Crisis (EPIC) lab at the University of Colorado along with the National Center for Atmospheric Research (NCAR). This project aimed to identify relevant information from social media during natural disasters in order to assist first responders, government agencies, and affected populations. We developed improved machine learning classification for tweet relevance, as well building classification based on language and location for predicting evacuation behavior.

  For more, see http://epic.cs.colorado.edu/

Publications and More

Primary Author

- (in submission) Stowe, Kevin; Moeller, Sarah; Michaelis, Laura; Palmer, Martha. Linguistic Analysis Improves Neural Metaphor Detection. Submitted to *Association of Computational Linguistics* (ACL), 2019. Florence, Italy.

- Stowe, Kevin; Palmer, Martha; Anderson, Jennings; Kogan, Marina; Palen, Leysia; Anderson, Kenneth M.; Morss, Rebecca; Demuth, Julie; Lazrus, Heather. Developing and Evaluating Annotation Procedures for Twitter Data during Hazard Events. in *Proceedings of the Joint Workshop on Linguistic Annotation, Multiword Expressions and Constructions (LAW-MWE-CxG-2018)*, held with the International Committee on Computational Linguistics Conference (COLING). pg 133-143. 2018. Santa Fe, New Mexico, US.

- Stowe, Kevin; Anderson, Jennings; Palmer, Martha; Palen, Leysia; Anderson, Kenneth M. Improving Classification of Twitter Behavior During Hurricane Events. in *Proceedings of the Workshop on Natural Language Processing for Social Media (SocialNLP)*, held with the 56th Meeting of the Association of Computational Linguistics (ACL). pg 67-75. 2018. Melbourne, Australia

- Stowe, Kevin; Palmer, Martha. Leveraging Syntactic Constructions for Metaphor Identification and Interpretation. in *Proceedings of the Workshop on Figurative Language Processing*, held with the 16th Meeting of the North American Association of Computational Linguistics (NAACL). pg 17-26. 2018. New Orleans, Louisiana, US

- Stowe, Kevin; Paul, Michael J.; Palmer, Martha; Palen, Leysia; Anderson, Kenneth M. Identifying and Categorizing Disaster-Related Tweets, in *Proceedings of the International Workshop on Natural Language Processing for Social Media* at the Conference on Empirical Methods in Natural Language Processing (EMNLP). pg 1-6. 2016. Austin, Texas, US

Contributing Author

- Demuth, Julie L. et al, "sometimes da #beachlife ain't always da wave": Understanding People's Evolving Hurricane Risk Communication, Risk Assessments, and Responses Using Twitter Narratives, accepted to *Weather, Climate, and Society*. 2018.

- Palmer, Martha et al, The Pitfalls of Shortcuts: Tales from the word sense tagging trenches. in *Essays in Lexical Semantics and Computational Lexicography - In Honor of Adam Kilgarriff*. M. Diab, A. Villavicencio, M. Apidianaki, V. Kordoni, A. Korhonen, P. Nakov, M. Stevenson (editors). Springer series Text, Speech and Language Technology. Springer, 2018.

- Morss, Rebecca et al, Hazardous Weather Predication and Communication in the Modern Information. in *Bulletin of the American Meteorological Society*. 2016. 98, pg 2653-2674

- Anderson, Jennings et al; Far Far Away in *Far Rockaway*: Responses to Risks and Impacts during Hurricane Sandy through First-Person Social Media Narratives, in *Proceedings of ISCRAM*, Rio de Janeiro, Brazil, 2016.

- Bonial, Claire; Stowe, Kevin; Palmer, Martha. Renewing and Revising SemLink, in *The GenLex Workshop on Linked Data in Linguistics*, pg 9-17, 2013. Pisa, Italy

Presentations

- The Syntax and Semantics of Metaphor. For the Graduate Student Open House, University of Colorado, Mar 25th, 2019.

- Modern Computational Approaches to Metaphor. For LING 7800, Computational Lexical Semantics, instr. Martha Palmer. Nov 9th, 2018.

Program Committees

- Program Committee Member, Conference on Computational Natural Language Learning (CoNLL), 2017, Vancouver, Canada
- Program Committee Member, Corpus Linguistics Fest, 2016, Bloomington, Indiana, http://cl.indiana.edu/clif16/

Other

- Sponsor, Computer Science Senior Project, Computational Language and Education Research Website Development, 2019
- Student Volunteer, North American Association of Computational Linguistics (NAACL) 2015, Denver, Colorado
- Computer science tutor for Linguistic students, particularly in the aim of improving basic programming skills. Primarily in Python and C++, with other support as required.

Previous Employment

- **FindMyAudience (https://findmyaudience.wordpress.com/)** **Boulder, Colorado**
  NLP Consultant *May 2015–October 2015*

  I worked for FindMyAudience, a technology startup, to identify possible audiences for authors and publishing companies. Together we developed methods for identifying book similarities and consumer interests from social media and other sources using continuous word representations and latent semantics models.

- **Avaya Labs** **Westminster, Colorado**
  NLP Researcher *Summer 2013*

  As a research intern, I did analysis of social media data (Twitter and Facebook) using machine learning algorithms, particularly clustering, to determine trends in user interactions with public company sites. We identified differences in positive and negative reactions to a variety of companies using topic modelling on social media, allowing for better interaction between companies and their customers.

- **Jackson National Life** **Okemos, Michigan**
  Software Developer *2011-2012*

  I started as a software trainee and became a developer. Studying Java and SQL, I worked to promote new branches of company business and provide support to company staff.