

# Carolyn Jane Anderson

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## Research Focus

My research focuses on context-sensitive expressions: words whose meanings change depending on who is speaking to whom, and where. These aspects of language are some of the most challenging for artificial intelligence to grasp, because they are situational, grounded, and interactive. Exploring these questions can help us understand general cognitive behavior such as theory of mind (our beliefs about other people's mental states), and help artificial intelligence learn to use language in a dynamic, responsive way.

## Education

<b>Ph.D. in Linguistics.</b> University of Massachusetts, Amherst Dissertation: Shifting the Perspectival Landscape Advisors: Brian Dillon and Rajesh Bhatt	February 2021
<b>M.A. in Linguistics.</b> University of Massachusetts, Amherst	May 2019
<b>B.A. in Linguistics and minor in Computer Science.</b> Swarthmore College High Honors in Linguistics and Natural Language Models	June 2014

## Positions

<b>Wellesley College, Computer Science Department</b> Assistant Professor	2021–present
<b>BBN Technologies, Analytics and Machine Intelligence Group</b> Research Intern	2018–2019
<b>Fulbright Canada, University of Victoria and McGill University</b> Fulbright Research Fellow, supervised by Leslie Saxon and Jessica Coon	2014–2015

## Grants

NSF Future of Work Medium: AI-Assisted Programming: Equipping Social and Natural Scientists for the Future of Research. 2023-2027  
Collaborative award with Arjun Guha (Northeastern), Molly Feldman (Oberlin), and Erin Teich (Wellesley).

## Publications

1. Raymond Li, Loubna Ben Allal, Yangtian Zi, Niklas Muennighoff, Denis Kocetkov, Chenghao Mou, Marc Marone, Christopher Akiki, Jia Li, Jenny Chim, Qian Liu, Evgenii Zheltonozhskii, Terry Yue Zhuo, Thomas Wang, Olivier Dehaene, Mishig Davaadorj, Joel Lamy-Poirier, João Monteiro, Olek Shliakhko, Nicolas Gontier, Nicholas Meade, Armel Randy, Ming-Ho Yee, Logesh Kumar Umapathi, Jian Zhu, Benjamin Lipkin, Muhtasham Oblokulov, Zhiruo Wang, Rudra Murthy, Jason Stillerman,

- Siva Sankalp Patel, Dmitry Abulkhanov, Marco Zocca, Manan Dey, Zhihan Zhang, Nour Fahmy, Urvasi Bhattacharyya, Suriya Gunasekar, Wenhao Yu, Swayam Singh, Sasha Luccioni, Paulo Villegas, Maxim Kunakov, Fedor Zhdanov, Manuel Romero, Tony Lee, Nadav Timor, Jennifer Ding, Claire Schlesinger, Hailey Schoelkopf, Jan Ebert, Tri Dao, Mayank Mishra, Alex Gu, Jennifer Robinson, Carolyn Jane Anderson, Brendan Dolan-Gavitt, Danish Contractor, Siva Reddy, Daniel Fried, Dzmitry Bahdanau, Yacine Jernite, Carlos Muñoz Ferrandis, Sean Hughes, Thomas Wolf, Arjun Guha, Leandro von Werra, Harm de Vries. 2023. StarCoder: May the Source Be With You! To appear in *Transactions of Machine Learning Research*.
2. Zhao, Jingmiao and Carolyn Jane Anderson. Solving and Generating NPR Sunday Puzzles with Large Language Models. Short paper to appear in *Proceedings of the International Conference on Computational Creativity (ICCC)*.
  3. Federico Cassano, John Gouwar, Daniel Nguyen, Sydney Nguyen, Luna Phipps-Costin, Donald Pinckney, Ming-Ho Yee, Yangtian Zi, Carolyn Jane Anderson, Molly Q Feldman, Arjun Guha, Michael Greenberg, Abhinav Jangda. 2023. MultiPL-E: A Scalable and Extensible Approach to Benchmarking NL2Code for 18 Programming Languages. Accepted to *Transactions on Software Engineering*.
  4. Ben Allal, Loubna, Raymond Li, Denis Kocetkov, Chenghao Mou, Christopher Akiki, Carlos Munoz Ferrandis, Niklas Muennighoff, Mayank Mishra, Alex Gu, Manan Dey, Logesh Kumar Umapathi, **Carolyn Jane Anderson**, Yangtian Zi, Joel Lamy Poirier, Hailey Schoelkopf, Sergey Troshin, Dmitry Abulkhanov, Manuel Romero, Terry Yue Zhuo, Francesco De Toni, Bernardo García del Río, Qian Liu, Shamik Bose, Urvasi Bhattacharyya, Michael Lappert, Ian Yu, Paulo Villegas, Jia Li, David Lansky, Huu Nguyen, Danish Contractor, Luis Villa, Daniel Fried, Dzmitry Bahdanau, Yacine Jernite, Sean Hughes, Arjun Guha, Harm de Vries, Leandro von Werra. 2022. SantaCoder: Don't Reach For the Stars! Deep Learning for Code Workshop (DL4C), 2023. **Best Paper Award**.
  5. Anderson, Carolyn Jane and Brian Dillon. 2023. Grammatical perspective-taking in comprehension and production. *Open Mind*.
  6. Kolisko, Skylar and Carolyn Jane Anderson. 2023. Exploring Social Biases of Large Language Models in a College Artificial Intelligence Course. *Proceedings of the Thirteenth Symposium on Educational Advances in Artificial Intelligence (EAAI-23)*, co-located at AAAI 2023.
  7. Silva-Robles, Fe, Felipe H. Lopez, John Duff, and Carolyn Jane Anderson. 2022. Eliciting Associated Motion Constructions in Two Zapotec Languages. *Semantic Fieldwork Methods*.
  8. Bolaños Lewen, Carina and Carolyn Jane Anderson. 2022. (Some) parentheses are focus-sensitive operators. *Proceedings of Sinn und Bedeutung (SuB) 26*.
  9. Masis, Tessa and Carolyn Jane Anderson. ProSPer: Probing Human and Neural Network Language Model Understanding of Spatial Perspective. 2021. *Proceedings of the BlackboxNLP workshop at the Conference on Empirical Methods in Natural Language Processing 2021*.
  10. Phipps-Costin, Luna, Carolyn Jane Anderson, Michael Greenberg, and Arjun Guha. 2021. Solver-based Gradual Type Migration. *Proceedings of the ACM SIGPLAN Conference on Object Oriented Programming, Systems, Languages and Applications (OOPSLA) 2021*. **Selected for oral presentation. Distinguished Artifact Award**.
  11. Anderson, Carolyn Jane. 2021. Tell Me Everything You Know: A Conversation Update System for the Rational Speech Acts Framework. *Proceedings of the Society for Computation in Linguistics (SCiL) 4*.
  12. Anderson, Carolyn Jane. 2021. Coming in, or going out? Measuring the effect of discourse factors on perspective prominence. *Proceedings of Experiments in Linguistic Meanings (ELM) 1*.
  13. Anderson, Carolyn Jane. 2019. Tomorrow is not always a day away. *Proceedings of Sinn und Bedeutung (SuB) 23*. **Selected for oral presentation**.

14. Anderson, Carolyn Jane and Brian Dillon. 2019. Guess who's coming (and who's going): bringing perspective to the Rational Speech Acts framework. *Proceedings of the Society for Computation in Linguistics (SCiL)* 2.
15. Anderson, Carolyn Jane and Brook Danielle Lillehaugen. 2016. Negation in Colonial Valley Zapotec. *Transactions of the Philological Society* 114(3).
16. Anderson, Carolyn Jane, Nate Foster, Arjun Guha, Jean-Baptiste Jeannin, Dexter Kozen, Cole Schlesinger, and David Walker. 2014. NetKAT: Semantic foundations for networks. *Proceedings of the ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (POPL)* 2014. **Selected for oral presentation.**

## Conference Presentations

1. Carolyn Jane Anderson and Arjun Guha. Protagonist-Mediated Perspective. Poster to be presented at Sinn und Bedeutung 28.
2. Nguyen, Sydney and Carolyn Jane Anderson. Do All Minority Languages Look the Same to Chat-GPT? Linguistic (Mis)information in a Large Language Model. Poster presented at the Society for Computation in Linguistics (SCiL) 2023.
3. Carolyn Jane Anderson and Yoolim Kim. Cross-linguistic differences in processing parentheticals between English and Korean. Talk to be given at Comparative Punctuation Worldwide, 2023.
4. Carolyn Jane Anderson. Making AI Education More Interdisciplinary Through Computational Creativity. Talk given at the AAAI/ACM New and Future Educators Blue Sky session at EAAI, 2023.
5. Carolyn Jane Anderson. Protagonist-Mediated Perspective. Talk given at the Narration in Context workshop at the Deutsche Gesellschaft für Sprachwissenschaft (DGfS), 2022.
6. Anderson, Carolyn Jane. Diagnosing the semantics of perspectival expressions. Poster presented at the Annual Meeting of the Linguistic Society of America (LSA), 2021.
7. Anderson, Carolyn Jane and Tessa Masis. Can neural network language models understand spatial perspective? Paper presented at the Bridging AI and Cognitive Science (BAICS) workshop, at the International Conference on Learning Representations (ICLR), 2020.
8. Anderson, Carolyn Jane and Brian Dillon. Taking other perspectives into account: an RSA model of perspectival reasoning. Talk given at Rational Approaches in Language Science (RAiLS), 2019.
9. Anderson, Carolyn Jane. Explaining the progressive motion verb puzzle in Zapotec. Talk given at the Texas Linguistics Society, 2019.
10. Anderson, Carolyn Jane. *Tomorrow* isn't always a day away. Poster presented at the 31st annual CUNY Human Sentence Processing Conference, 2018.
11. Anderson, Carolyn Jane. The San Lucas Quiaviní Zapotec andative and venitive. Talk presented at the Society for the Study of Indigenous Languages of the Americas (SSILA) annual meeting, 2018. **Honorable Mention, Best Student Paper Presentation**
12. Anderson, Carolyn Jane. The andative and venitive construction in San Lucas Quiaviní Zapotec. Talk presented at Multi-Verb Constructions: Semantic, Syntactic and Typological Perspectives (MVC), 2017.
13. Anderson, Carolyn Jane and Brook Danielle Lillehaugen. The morphosyntax of negation in Colonial Valley Zapotec. Talk presented at the Society for the Study of Indigenous Languages of the Americas (SSILA) annual meeting, 2015.

14. Anderson, Carolyn Jane and Brook Danielle Lillehaugen. La morfosintaxis de la negation en el zapoteco del Valle colonial. Talk presented at Coloquio sobre Lenguas Otomangues y Vecinas (COLOV) IV: Mario Molina Cruz, 2014.
15. Anderson, Carolyn Jane. Language ideology and human rights doctrine in Morocco. Talk presented at New Ways of Analyzing Variation (N WAV) 42, 2013.

## Manuscripts

1. Federico Cassano, John Gouwar, Francesca Lucchetti, Claire Schlesinger, Carolyn Jane Anderson, Michael Greenberg, Abhinav Jangda, and Arjun Guha. 2023. Knowledge Transfer from High-Resource to Low-Resource Programming Languages for Code LLMs.
2. Hannah Babe, Sydney Nguyen, Yangtian Zi, Arjun Guha, Molly Q Feldman, and Carolyn Jane Anderson. 2023. StudentEval: a Benchmark of Student-Written Prompts for Large Language Models of Code.
3. Anderson, Carolyn Jane. 2021. Untangling classes of context-sensitivity: a closer look at the semantics of American English *tomorrow*.
4. Anderson, Carolyn Jane. 2021. Shifting the Perspectival Landscape: Methods for Encoding, Identifying, and Selecting Perspectives. Dissertation, University of Massachusetts, Amherst.
5. Anderson, Carolyn Jane. 2017. The andative and venitive construction in San Lucas Quiavini Zapotec. Ms., University of Massachusetts, Amherst.
6. Anderson, Carolyn Jane. 2014. I talk it and I feel it: Language attitudes of Moroccan university students. Honors thesis, Swarthmore College.

## Invited Talks

“Evaluating Large Language Models of Code.”

- Brookhaven National Laboratory AI/ML Seminar Series. 2023.

“Large Language Models v. Humans.”

- University of Connecticut School of Law. 2023.

“Evaluating multi-language code generation.”

- MathWorks. 2023.

“A Bayesian approach to modeling grammatical perspective-taking.”

- GdR LIFT research group, ILFC (les interactions entre linguistiques formelles et computationnelles) Seminar. 2023.
- Brandeis University, Department of Linguistics and Computational Linguistics. 2021.

“Guess Who’s Coming to Dinner: a Bayesian approach to modeling perspective.”

- Boston University, Department of Linguistics. 2020.
- Cornell Tech, Department of Computer Science. 2020.

- Colgate University, Department of Computer Science. 2019.
- Denison University, Department of Data Analytics. 2019.
- James Madison University, Department of Computer Science. 2019.
- Mount Holyoke College, Department of Computer Science. 2019.
- Occidental College, Department of Computer Science. 2019.
- University of Massachusetts, Amherst, Department of Computer Science. 2019.
- Wellesley College, Department of Computer Science. 2019.

## Other Presentations

1. Anderson, Carolyn Jane. What (Some) Parentheses Mean. Poster presented at the UMass Linguistics department's 50th anniversary celebration, 2023.
2. Anderson, Carolyn Jane. Reasoning about perspectives. Abstract selected for presentation at the Science Speed Geeking event at the XPrag Summer School, 2019.
3. Anderson, Carolyn Jane. Use your words (better): two projects on making better use of text for ASR. Intern presentation, BBN Technologies, 2019.
4. Anderson, Carolyn Jane. Neural networks for ASR: focusing on the text. Intern presentation, BBN Technologies, 2018.

## Teaching

1. Instructor, Wellesley College, Computer Science Department Fall 2022  
**CS333: Natural Language Processing**
2. Instructor, Wellesley College, Computer Science Department Spring and Fall 2022  
**CS232: Artificial Intelligence**
3. Instructor, Wellesley College, Computer Science Department Fall 2021, Spring 2022, Spring 2023  
**CS111: Introduction to Computer Science**
4. Instructor, Wellesley College, Computer Science Department Fall 2021  
**CS251: Principles of Programming Languages**
5. Instructor, University of Massachusetts Amherst, Linguistics Department Fall 2019  
**First Year Seminar: Technology for Language Revitalization**
6. Teaching Assistant, University of Massachusetts Amherst, Linguistics Department Fall 2019  
**Language Processing and the Brain** (Instructor: Brian Dillon)
7. Instructor, Mt. Holyoke College, Computer Science Department Fall 2018  
**Programming Languages**
8. Teaching Assistant, University of Massachusetts Amherst, Linguistics Department Spring 2017  
**Introduction to Linguistic Theory** (Instructor: Seth Cable)
9. Teaching Assistant, University of Massachusetts Amherst, Linguistics Department Fall 2017  
**Cognitive Modeling** (Instructor: Gaja Jarosz)

## Advising

### Wellesley College Research Projects

Sydney Nguyen How do beginning programmers use code generation tools?	2022-present
Rachelle Hu The geometric space of code embeddings	2022-present
Kiara Liu and Miranda Zhu Building an NLP pipeline for Chinese literature	2022-2023
Cheryl Wang Quantifying word embedding bias from historical events	2022-2023
Darcy Kim, Aizah Rao, Alexandra Chin Quantifying word embedding bias from historical events	2021-2022
Kiara Liu Inspector BERT: murder mysteries as a case study on language model narrative understanding	2021-2022
Angel Ding Machine learning tools for identifying and classifying marginalia in medieval manuscripts	2021-2022
Rachelle Hu How do beginning programmers use code generation tools?	2021-2022

### Wellesley College Honors Theses

Michelle Zhao Solving and Generating NPR Sunday Puzzles with Large Language Models	2022-2023
Skylar Kolisko Exploring Name Bias in NLP Models	2022
Funing Yang An Extraction and Representation Pipeline for Literary Characters	2021-2022

### University of Massachusetts, Amherst

Tessa Masis Project: Experimental and computational modeling of perspectival motion verbs	2019-2020
Alicia LeClair Project: Perspectival motion verbs in Western Tlacolula Valley Zapotec	2017

### Other

Carina Bolaños Lewen Project: Semantics and pragmatics of perspectival motion verbs and parentheticals	2020-2021
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## Awards

AAAI/ACM SIGAI New and Future AI Educator	2023
Computing Research Association Outstanding Undergraduate Researchers Award Finalist	2014
The Linguistics Prize in Applications of Theory, Swarthmore College	2014
Phi Beta Kappa Inductee	2014
Philip M. Hicks Prize for Best Critical Essay	2013

## Fellowships

BBN Technologies Research Fellowship	2019 and 2020
Selkirk Linguistics Outreach Fund Award	2016
University of Massachusetts Amherst Fellowship	2015–2016
Fulbright Canada Research Scholarship	2014–2015
Programming Languages Mentoring Workshop Scholarship	2013 and 2014
Marianne Durand Frey '57 Scholar	2011–2014
National Merit Scholar	2010

## Research Assistantships

<b>University of Massachusetts Amherst, Linguistics Department</b> Research Assistant Primary investigator: Seth Cable Topic: Semantics of Endangered Languages in North America	2017
<b>University of Massachusetts Amherst, Linguistics Department</b> Research Assistant Primary investigator: Gaja Jarosz Topic: Computational phonology	2016
<b>Haverford College, Ticha Digital Humanities Project</b> Research Intern Advisor: Brook Lillehaugen Topic: Web-based preservation and presentation of Colonial Valley Zapotec texts	2014
<b>Cornell University, Computer Science Department</b> Research Intern, supervised by Nate Foster Topic: NetKAT: a domain-specific language for networking	2013

## Service

Ruhlman committee member	2023
Tenure-track advisory committee member	2023

CS representative to the Summer Research Program selection committee	2022
Coding Club supervisor	2021-2022
Volunteer, Skype A Scientist	2020
Organizer, Neural Networks in Linguistics Reading Group	2018-2020

## Reviewing

Reviewer, NeurIPS Datasets and Benchmarks track	2023
Reviewer, <i>Society for Computation in Linguistics</i>	2022, 2023
Reviewer, <i>Society for Human Sentence Processing</i> (HSPS) Annual Conference	2022, 2023
Reviewer, BlackboxNLP workshop at EMNLP	2022, 2023
Reviewer, <i>Association for the Advancement of Artificial Intelligence</i> (AAAI)	2022
Ad hoc reviewer, ACL Rolling Review	2021
Ad hoc reviewer, <i>Psychological Review</i>	2021
Ad hoc reviewer, <i>Language</i>	2020