

Michael Sullivan

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Education

PhD in Linguistics <i>Semantics/Pragmatics Track</i> <i>University at Buffalo</i> <i>Thesis:</i> Language Modeling over Logical Forms	<i>August 2020 - June 2025</i>
MS in Computer Science and Engineering <i>Research/Honors Track</i> <i>University at Buffalo</i> <i>MS Project:</i> Probing NLI Models with External Negation	<i>August 2023 - June 2024</i>
BA in Linguistics with Research Distinction <i>The Ohio State University</i> <i>Minors:</i> Spanish, German <i>Thesis:</i> A Nondeterministically-Enumerated Categorial Grammar Analysis of Croatian and English Passive Constructions	<i>August 2016 - May 2019</i>

Research Interests

- Logical Reasoning with LLMs
- LLM Agents/Reinforcement Learning
- (Neurosymbolic) NLP/NLU
- Formal Semantics

Academic Positions

Postdoctoral Researcher <i>Saarland University</i>	<i>August 2024 - Present</i>
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Industry Positions

NLP Research Intern <i>BlueHalo LLC</i>	<i>May 2023 - August 2023</i>
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Research Groups

Computational Linguistics Group (Dr. Alexander Koller) <i>Saarland University</i>	<i>August 2024 - Present</i> Member
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NLP Research Group (Dr. Rohini Srihari) <i>University at Buffalo</i>	<i>March 2023 - May 2024</i> Member
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BERT/Distributional Semantics Lab
University at Buffalo

January 2021 - May 2024
Coordinator

Syntax/Semantics Lab (Dr. JP Koenig, Dr. Rui Chaves)
University at Buffalo

August 2020 - May 2024
Member

Service

LangLunches Talk Series Organizing Committee
Saarland University

April 2024 - August 2023
Member

Erasmus Mundus LCT Summer School Hackathon
Saarland University

August 28, 2024
Jury Member

Graduate Linguistics Association
University at Buffalo

August 2022 - August 2023
Secretary

Workshops and Invited Talks

Theoretical Connections to GRPO and Their Applications to Tool Use *November 12, 2025*
Intuit AI Learning Series *Invited Talk*

Distributed Machine Learning
University at Buffalo CSE Fall 2023 Workshop Series

September 25, 2023
Speaker

PyTorch Tutorial
University at Buffalo CSE Fall 2023 Workshop Series

September 22, 2023
Event Manager

Teaching (Instructor of Record)

Software Project: Pretraining Language Models
Saarland University

Winter 2025/26

Foundations of Linguistics (Semantics Unit)
Saarland University

Winter 2025/26

Semantic Theory
Saarland University

Summer 2025

Seminar: Graph Deep Learning for NLP
Saarland University

Winter 2024/25

Software Project: Pretraining Language Models
Saarland University

Winter 2024/25

Introduction to Linguistic Analysis (LIN 205)
University at Buffalo

Fall 2022

Advising

Luisa Geiger *(Advisor, Saarland University, 2025)*
Investigating Logical Consistency in Automatically Generated Sewing Instructions *(MSc Thesis)*

Publications

Michael Sullivan, Mareike Hartmann, and Alexander Koller (2025). Procedural Environment Generation for Tool-Use Agents. In *Proceedings of the 2025 Conference on Empirical Methods in Natural Language Processing* (in print).

Nicola Horst, Davide Mazzaccara, Antonia Schmidt, Michael Sullivan, Filippo Momentè, Luca Franceschetti, Philipp Sadler, Sherzod Hakimov, Alberto Testoni, Raffaella Bernardi, Raquel Fernández, Alexander Koller, Oliver Lemon, David Schlangen, Mario Giulianelli, and Alessandro Suglia (2025). Playpen: An Environment for Exploring Learning Through Conversational Interaction. In *Proceedings of the 2025 Conference on Empirical Methods in Natural Language Processing* (in print).

Luisa Geiger, Mareike Hartmann, Michael Sullivan, and Alexander Koller (2025). Evaluating Spatiotemporal Consistency in Automatically Generated Sewing Instructions. In *Proceedings of the 2025 Conference on Empirical Methods in Natural Language Processing* (in print).

Michael Sullivan (2025). Exploring Graph Representations of Logical Forms for Language Modeling. In *Findings of the Association for Computational Linguistics: ACL 2025*.

Michael Sullivan (2025). *Language Modeling over Logical Forms* (Doctoral dissertation, University at Buffalo).

Michael Sullivan (2024). It is not True that Transformers are Inductive Learners: Probing NLI Models with External Negation. In *Proceedings of the 18th Conference of the European Chapter of the Association for Computational Linguistics (Volume 1: Long Papers)*, 1924-1945.

Michael Sullivan, Navid Madani, Sougata Saha, and Rohini Srihari (2023). Positional Transformers for Claim Span Identification. In *Forum for Information Retrieval Evaluation (Working Notes)*.

Sougata Saha, Michael Sullivan, and Rohini Srihari (2023). Hate Speech Detection in Low Resource Indo-Aryan Languages. In *Forum for Information Retrieval Evaluation (Working Notes)*.

Michael Sullivan, Mohammed N. Yasin, and Cassandra L. Jacobs (2023). University at Buffalo at SemEval-2023 Task 11: MASDA–Modelling Annotator Sensibilities through DisAggregation. In *Proceedings of the The 17th International Workshop on Semantic Evaluation (SemEval-2023)*.

Nominated for Best System Award at SemEval 2023

Michael Sullivan (2023). Formal-Logical Distributional Semantics: Applications to Property Inference. In *Workshop on Knowledge Augmented Methods for Natural Language Processing at AAAI 2023*.