

Elias Stengel-Eskin

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EDUCATION

University of North Carolina, Chapel Hill Postdoctoral Research Associate – <i>Advisor: Mohit Bansal</i>	Chapel Hill, USA 2023 –current
Johns Hopkins University Ph.D. in Computer Science – <i>Advisor: Benjamin Van Durme</i> <ul style="list-style-type: none">– Ph.D. thesis: “Modeling Meaning for Description and Interaction”– supported by NSF Graduate Research Fellowship	Baltimore, USA 2018–2023
Johns Hopkins University MSE in Computer Science – <i>Advisor: Benjamin Van Durme</i>	Baltimore, USA 2018–2021
McGill University Bachelor of Arts and Sciences in Cognitive Science <ul style="list-style-type: none">– Minor: Linguistics– First Class Honours– Honours thesis: “Variational Bayesian Inference for Unsupervised Lexicon Discovery” – <i>Advisor: Timothy O’Donnell</i>	Montréal, Canada 2014–2018

EXPERIENCE

Microsoft Research Researcher (Consulting)	February 2025–Present
Microsoft Research PhD Research Intern – <i>Advisors: Marc-Alexandre Côté, Eric Yuan, Pierre-Yves Oudeyer</i>	March 2022–March 2023
Microsoft Research - Semantic Machines PhD Research Intern – <i>Advisor: Yu Su</i>	Summer 2021
Montreal Computational and Quantitative Linguistics Lab Research Assistant – <i>Advisor: Morgan Sonderegger</i>	Montreal, Canada 2016–2018

PUBLICATIONS (PEER-REVIEWED)

- [1] Ziyang Wang*, Shoubin Yu*, **Elias Stengel-Eskin***, Jaehong Yoon, Feng Cheng, Gedas Bertasius, and Mohit Bansal, “VideoTree: Adaptive tree-based video representation for LLM reasoning on long videos”, *Proceedings of the Forty-Second Annual IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2025.
- [2] Zaid Khan, **Elias Stengel-Eskin**, Jaemin Cho, and Mohit Bansal, “DataEnvGym: Data generation agents in teacher environments with student feedback”, *The Thirteenth International Conference on Learning Representations (ICLR) Spotlight*, 2025.

- [3] Swarnadeep Saha, Archiki Prasad, Justin Chih-Yao Chen, Peter Hase, **Elias Stengel-Eskin**, and Mohit Bansal, “System-1.x: Learning to balance fast and slow planning with language models”, *The Thirteenth International Conference on Learning Representations (ICLR)*, 2025.
- [4] Amith Ananthram, **Elias Stengel-Eskin**, Carl Vondrick, Mohit Bansal, and Kathleen McKeown, “See it from my perspective: Diagnosing the western cultural bias of large vision-language models in image understanding”, *The Thirteenth International Conference on Learning Representations (ICLR)*, 2025.
- [5] **Elias Stengel-Eskin**, Peter Hase, and Mohit Bansal, “Teaching models to balance resisting and accepting persuasion”, *Proceedings of the Conference of the Nations of the Americas Chapter of the Association for Computational Linguistics (NAACL)*, 2025.
- [6] David Wan, Justin Chih-Yao Chen, **Elias Stengel-Eskin**, and Mohit Bansal, “MAMM-Refine: A recipe for improving faithfulness in generation with multi-agent collaboration”, *Proceedings of the Conference of the Nations of the Americas Chapter of the Association for Computational Linguistics (NAACL)*, 2025.
- [7] Han Wang, Archiki Prasad, **Elias Stengel-Eskin**, and Mohit Bansal, “AdaCAD: Adaptively decoding to balance conflicts between contextual and parametric knowledge”, *Proceedings of the Conference of the Nations of the Americas Chapter of the Association for Computational Linguistics (NAACL)*, 2025.
- [8] **Elias Stengel-Eskin**, Peter Hase, and Mohit Bansal, “LACIE: Listener-aware finetuning for confidence calibration in large language models”, *Advances in Neural Information Processing Systems 38*, 2024.
- [9] Jinhao Duan, Renming Zhang, James Diffenderfer, Bhavya Kailkhura, Lichao Sun, **Elias Stengel-Eskin**, Mohit Bansal, Tianlong Chen, and Kaidi Xu, “GTBench: Uncovering the strategic reasoning limitations of LLMs via game-theoretic evaluations”, *Advances in Neural Information Processing Systems 38*, 2024.
- [10] Ansel Blume, Khanh Duy Nguyen, Zhenhailong Wang, Yangyi Chen, Michal Shlapentokh-Rothman, Xiaomeng Jin, Jeonghwan Kim, ..., **Stengel-Eskin-Elias**, *et al.*, “MIRACLE: An online, explainable multimodal interactive concept learning system”, in *Proceedings of the 32nd ACM International Conference on Multimedia*, 2024.
- [11] Peter Hase, Thomas Hofweber, Xiang Zhou, **Elias Stengel-Eskin**, and Mohit Bansal, “Fundamental problems with model editing: How should rational belief revision work in LLMs?”, *Transactions on Machine Learning*, 2024.
- [12] **Elias Stengel-Eskin**, Archiki Prasad, and Mohit Bansal, “ReGAL: Refactoring programs to discover generalizable abstractions”, *The 41st International Conference on Machine Learning (ICML)*, 2024.
- [13] Justin Chih-Yao Chen, Swarnadeep Saha, **Elias Stengel-Eskin**, and Mohit Bansal, “MAGDi: Structured distillation of multi-agent interaction graphs improves reasoning in smaller language models”, *The 41st International Conference on Machine Learning (ICML)*, 2024.
- [14] Haotian Fu, Pratyusha Sharma, **Elias Stengel-Eskin**, George Konidaris, Nicolas Le Roux, Marc-Alexandre Côté, and Xingdi Yuan, “Language-guided skill learning with temporal variational inference”, *The 41st International Conference on Machine Learning (ICML)*, 2024.
- [15] David Wan, Jaemin Cho, **Elias Stengel-Eskin**, and Mohit Bansal, “Contrastive region guidance: Improving grounding in vision-language models without training”, *The 18th European Conference on Computer Vision (ECCV)*, 2024.
- [16] Han Wang*, Archiki Prasad*, **Elias Stengel-Eskin***, and Mohit Bansal, “Soft self-consistency improves language model agents”, *Proceedings of the 62nd Annual Meeting of the Association for Computational Linguistics (ACL)*, 2024.
- [17] Maryam Hashemzadeh, **Elias Stengel-Eskin**, Sarath Chandar, and Marc-Alexandre Cote, “Sub-goal distillation: A method to improve small language agents”, *The 3rd Conference on Lifelong Learning Agents (CoLLAs)*, 2024.

- [18] **Elias Stengel-Eskin**, Kyle Rawlins, and Benjamin Van Durme, “Zero and few-shot semantic parsing with ambiguous inputs”, in *The Twelfth International Conference on Learning Representations (ICLR)*, 2024.
- [19] Archiki Prasad, **Elias Stengel-Eskin**, and Mohit Bansal, “Rephrase, augment, reason: Visual grounding of questions for vision-language models”, in *The Twelfth International Conference on Learning Representations (ICLR)*, 2024.
- [20] **Elias Stengel-Eskin** and Benjamin Van Durme, “Did You Mean...? Confidence-based Trade-offs in Semantic Parsing”, *Proceedings of the 2023 Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2023.
- [21] **Elias Stengel-Eskin** and Benjamin Van Durme, “Calibrated Interpretation: Confidence Estimation in Semantic parsing”, *Transactions of the Association for Computational Linguistics (TACL)*, 2023.
- [22] **Elias Stengel-Eskin**, Jimena Guallar-Blasco, Yi Zhou, and Benjamin Van Durme, “Why Did the Chicken Cross the Road? Rephrasing and Analyzing Ambiguous Questions in VQA”, *Proceedings of the 61st Annual Meeting of the Association for Computational Linguistics (ACL)*, 2023.
- [23] Zhuowan Li, Xingrui Wang, **Elias Stengel-Eskin**, Adam Kortylewski, Wufei Ma, Benjamin Van Durme, and Alan Yuille, “Super-CLEVR: A Virtual Benchmark to Diagnose Domain Robustness in Visual Reasoning”, *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2023.
- [24] **Elias Stengel-Eskin** and Benjamin Van Durme, “The Curious Case of Control”, *Proceedings of the 2022 Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2022.
- [25] **Elias Stengel-Eskin**, Emmanouil Antonios Platanios, Adam Pauls, Sam Thomson, Hao Fang, Benjamin Van Durme, Jason Eisner, and Yu Su, “When More Data Hurts: A Troubling Quirk in Developing Broad-Coverage Natural Language Understanding Systems”, *Proceedings of the 2022 Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2022.
- [26] Chenyu Zhang, Benjamin Van Durme, Zhuowan Li, and **Elias Stengel-Eskin**, “Visual Commonsense in Pretrained Unimodal and Multimodal Models”, in *Proceedings of the 2022 Conference of the North American Chapter of the Association for Computational Linguistics (NAACL)*, Seattle, Washington: Association for Computational Linguistics, 2022.
- [27] **Elias Stengel-Eskin**, Andrew Hundt, Zhuohong He, Aditya Murali, Nakul Gopalan, Matthew Gombolay, and Gregory D. Hager, “Guiding Multi-Step Rearrangement Tasks with Natural Language Instructions”, in *5th Annual Conference on Robot Learning (CoRL)*, 2021.
- [28] Zhuowan Li, **Elias Stengel-Eskin**, Yixiao Zhang, Cihang Xie, Quan Tran, Benjamin Van Durme, and Alan Yuille, “Calibrating Concepts and Operations: Towards Symbolic Reasoning on Real Images”, in *Proceedings of the IEEE/CVF International Conference on Computer Vision (ICCV)*, 2021.
- [29] **Elias Stengel-Eskin**, Jimena Guallar-Blasco, and Benjamin Van Durme, “Human-Model Divergence in the Handling of Vagueness”, in *Proceedings of the 1st Workshop on Understanding Implicit and Underspecified Language (UnImplicit)*, Online: Association for Computational Linguistics, 2021.
- [30] **Elias Stengel-Eskin**, Kenton Murray, Sheng Zhang, Aaron Steven White, and Benjamin Van Durme, “Joint Universal Syntactic and Semantic Parsing”, *Transactions of the Association for Computational Linguistics (TACL)*, 2021.
- [31] **Elias Stengel-Eskin**, Jimena Guallar-Blasco, and Benjamin Van Durme, “Exploring Human-Model Divergence Through Vagueness”, *Proceedings of the Society for Computation in Linguistics (SCiL)*, 2021, ***Abstract**.
- [32] Ryan Culkin, J. Edward Hu, **Elias Stengel-Eskin**, Guanghui Qin, and Benjamin Van Durme, “Iterative Paraphrastic Augmentation with Discriminative Span Alignment”, *Transactions of the Association for Computational Linguistics (TACL)*, volume 9, 2021.

- [33] **Elias Stengel-Eskin**, Aaron Steven White, Sheng Zhang, and Benjamin Van Durme, “Universal Decompositional Semantic Parsing”, in *Proceedings of the 58th Annual Meeting of the Association for Computational Linguistics (ACL)*, 2020.
- [34] Aaron Steven White, **Elias Stengel-Eskin**, Siddharth Vashishtha, Venkata Subrahmanyam Govindarajan, Dee Ann Reisinger, Tim Vieira, Keisuke Sakaguchi, Sheng Zhang, Francis Ferraro, Rachel Rudinger, *et al.*, “The Universal Decompositional Semantics Dataset and Decomp Toolkit”, in *Proceedings of The 12th Language Resources and Evaluation Conference*, 2020.
- [35] **Elias Stengel-Eskin**, Tzu-Ray Su, Matt Post, and Benjamin Van Durme, “A Discriminative Neural Model for Cross-Lingual Word Alignment”, in *Proceedings of the 2019 Conference on Empirical Methods in Natural Language Processing and the 9th International Joint Conference on Natural Language Processing (EMNLP-IJCNLP)*, 2019.
- [36] Michael McAuliffe, **Elias Stengel-Eskin**, Michaela Socolof, and Morgan Sonderegger, “Polyglot and Speech Corpus Tools: A System for Representing, Integrating, and Querying Speech Corpora.” In *INTERSPEECH*, 2017.

PUBLICATIONS (OTHER)

1. Zaid Khan, **Elias Stengel-Eskin**, Archiki Prasad, Jaemin Cho, Mohit Bansal, “Executable Functional Abstractions: Inferring Generative Programs for Advanced Math Problems” (2025), *Under Review*
2. Hanqi Xiao, Yi-Lin Sung, **Elias Stengel-Eskin**, Mohit Bansal, “Task-Circuit Quantization: Leveraging Knowledge Localization and Interpretability for Compression” (2025), *Under Review*
3. Duy Nguyen, Archiki Prasad, **Elias Stengel-Eskin**, Mohit Bansal, “Multi-Attribute Steering of Language Models via Targeted Intervention” (2025), *Under Review*
4. Vaidehi Patil, **Elias Stengel-Eskin**, Mohit Bansal, “UPCORE: Utility-Preserving Coreset Selection for Balanced Unlearning” (2025), *Under Review*
5. Yue Huang, Chujie Gao, Siyuan Wu, ..., **Elias Stengel-Eskin**, ..., Bo Li, Xiangliang Zhang, “On the Trustworthiness of Generative Foundation Models: Guideline, Assessment, and Perspective” (2025), *Preprint*
6. Archiki Prasad*, **Elias Stengel-Eskin***, Justin Chih-Yao Chen, Zaid Khan, Mohit Bansal, “Learning to Generate Unit Tests for Automated Debugging” (2025), *Under Review*
7. Duy Nguyen, Archiki Prasad, **Elias Stengel-Eskin**, Mohit Bansal, “LASER: Learning to Adaptively Select Reward Models with Multi-Armed Bandits” (2024), *Under Review*
8. Justin Chih-Yao Chen, Archiki Prasad, Swarnadeep Saha, **Elias Stengel-Eskin**, Mohit Bansal, “MAGICoRe: Multi-Agent, Iterative, Coarse-to-Fine Refinement for Reasoning” (2024), *Under Review*
9. Thomas Hofweber, Peter Hase, **Elias Stengel-Eskin**, Mohit Bansal, “Are language models rational? The case of coherence norms and belief revision” (2024), *Preprint*
10. **Elias Stengel-Eskin**, “Modeling Meaning for Description and Interaction”, (2023) **Ph.D. Thesis**
11. Jimena Guallar-Blasco, **Elias Stengel-Eskin**, Benjamin Van Durme, “Analyzing Question Ambiguity in *Why*-Questions” (2023), *Mid-Atlantic Student Colloquium on Speech, Language and Learning (MASC-SLL 2023)*
***Abstract**
12. Shalaka Vaidya, **Elias Stengel-Eskin**, Joao Sedoc, “Automatic Evaluation of Chit-chat via Semantic Parsing” (2022), *Mid-Atlantic Student Colloquium on Speech, Language and Learning (MASC-SLL 2022)* ***Abstract**
13. Yunmo Chen, Seth Ebner, Tongfei Chen, Patrick Xia, **Elias Stengel-Eskin**, Tzu-Ray Su, J. Edward Hu, Nils Holzenberger, Ryan Culkin, Craig Harman, Max Thomas, Thomas Lippincott, Aaron Steven White, Kyle Rawlins, Benjamin Van Durme, “NIST TAC SM-KBP 2019 System Description: JHU/UR Framework”, (2019)

14. **Elias Stengel-Eskin**, “Variational Bayesian Inference for Unsupervised Lexicon Discovery” (2017), Undergraduate Honours Thesis

FUNDING

Received

<ul style="list-style-type: none">• IARPA BENGAL \$290k. Role: Postdoc	2025-2027
<ul style="list-style-type: none">• NSF NAIRR Pilot Grant <i>Supervising Calibration for Safe and Trustworthy Artificial Intelligence Systems</i> 2,500 GPU Hours. Role: PI	2024-2025
<ul style="list-style-type: none">• Cisco Gift <i>Improving LLM Reliability and Trustworthiness via Overconfidence Reduction and Conversation</i> \$75K. Role: Co-PI	2025
<ul style="list-style-type: none">• CapitalOne Gift <i>Multi-Agent Systems and Mixtures-of-Experts for Robust Generation</i> Role: Co-PI	2025
<ul style="list-style-type: none">• Center for AI Safety Compute Grant <i>Listener-Aware Confidence Calibration for Improving LLM Reliability and Trustworthiness</i> Unlimited A100 GPU access. Role: Co-PI	2024
<ul style="list-style-type: none">• NSF Graduate Research Fellowship Role: Student	2018-2023

Pending and Submitted

<ul style="list-style-type: none">• NSF LEAP HI <i>Transforming Robotic Rehabilitation through AI-Empowered Personification of Patient-Robot-Clinician Interactions</i> Role: Postdoc	Submitted
<ul style="list-style-type: none">• NSF HCC Medium <i>Programmable Robot Macros in Mixed Reality</i> Role: Postdoc	Submitted

White Papers

- **NSF Small**
Adaptively Generating Optimal Environments for Lifelong Human and Artificial Learning
Role: Co-PI
- **NSF BSF**
Grounded Text Generation Programs for Explainability, Traceability, and Granular Control
Role: Postdoc

NEWS COVERAGE

1. *The importance of ambiguity*, Johns Hopkins University CS News, 04/15/2024
2. *Speaking easy: A simple method to clarify voice commands*, Johns Hopkins University CS News, 01/08/2024

INVITED TALKS

- **Communication, Calibration, and Grounding for Collaborative AI Agents** January 8, 2025
Duke University
- **Confidence-based Rephrasing, Refinement, and Selection** March 22nd, 2024
Keynote – UncertaiNLP Workshop, EACL 2024
- **Ambiguity in NLP** October 26th, 2023
UNC Chapel Hill – Linguistics Department
- **Uncertainty and Ambiguity in Semantic Structures** October 6th, 2023
Emory University
- **Language, Structure, and Beyond** May 9th, 2023
UNC Chapel Hill – MURGe Group
- **Language, Structure, and Beyond** April 4th, 2023
Scaled Cognition
- **Language, Structure, and Beyond** March 13th, 2023
Brandeis University – CS Department
- **Language, Structure, and Beyond** March 2nd, 2023
University of Cambridge – CS Department
- **Language, Structure, and Beyond** February 17th, 2023
George Mason University – George Mason NLP Group
- **Language, Structure, and Beyond** February 1st, 2023
Georgetown University – NERT Lab
- **Joint Universal Syntactic and Semantic Parsing** April 1st, 2022
Cornell University – Workshop on Meaning in Language

HONORS AND AWARDS

Honors and Awards

- First Class Honours in Cognitive Science 2018
- Dean’s Honor List (top 10% of faculty) 2014–2015, 2016–2018
- Arts Undergraduate Research Internship Award 2016
- NSF Graduate Research Fellowship 2019

SERVICE

Reviewing

- **Area Chair:** ACL ARR (2024), EMNLP ARR (2024), NAACL ARR (2025)
- **Primary Reviewer:** ACL (2021, 2022), NAACL 2022, EACL 2023, CoRL 2023, EMNLP 2023, NeurIPS 2024, WiNLP 2024, ICLR 2025, ICML 2025
- **Secondary Reviewer:** NeurIPS 2020, ACL 2020, NAACL 2019, TACL
- **Program Committee:** UnImplicit 2022, SouthNLP 2024

Organizing

- **Workshop Organizer:** UnImplicit 2024
- **Conference Organizer:** EMNLP 2024 (Publicity Chair)

Committees

- **CLSP Visit Weekend Committee**, 2018-2022
- **CLSP Admissions Committee**, 2022-2023
- **Application Mentoring Group**, 2022-2023

TEACHING

- **Guest Lecturer** at UNC Chapel Hill Fall 2024
Advanced Topics in Natural Language Processing (Aligning LLMs and Humans – COMP 790-158)
- **Guest Lecturer** at UNC Chapel Hill Fall 2024
Deep Learning (COMP 664)
- **Guest Lecturer** at UNC Chapel Hill Fall 2023, Fall 2024
Computational Linguistics
- **Teaching Assistant** at Johns Hopkins University Fall 2019
Artificial Intelligence (EN.601.464/664)

MENTORING

- Vaidehi Patil Fall 2024-Present
Ph.D. Student (UNC)
- Zaid Khan Fall 2024-Present
Ph.D. Student (UNC)
- Duy Nguyen Fall 2024-Present
Ph.D. Student (UNC)
- Amith Ananthram Winter 2024-Present
Ph.D. Student (Columbia)
- Ziyang Wang Fall 2023-Present
Ph.D. Student (UNC)
- Shoubin Yu Fall 2023-Present
Ph.D. Student (UNC)
- David Wan Fall 2023-Present
Ph.D. Student (UNC)
- Justin Chih-Yao Chen Fall 2023-Present
Ph.D. Student (UNC)
- Han Wang Fall 2023-Present
Ph.D. Student (UNC)
- Archiki Prasad Summer 2023-Present
Ph.D. Student (UNC)
- Hanqi Xiao Summer 2024-Present
Undergrad (UNC)
- Atin Pothviraj Summer 2024-Present
Undergrad (UNC)
- Nithin Sivakumaran Summer 2024-Present
Undergrad (UNC)
- Bryan Sukidi Fall 2024-Present
Undergrad (UNC)

<ul style="list-style-type: none"> Evan Paces-Wiles <i>Undergrad (UNC)</i> 	Fall 2024-Present
<ul style="list-style-type: none"> Jio Choi <i>Undergrad (UNC)</i> 	Fall 2024-Present
<ul style="list-style-type: none"> Aum Kendapadi <i>Undergrad (UNC)</i> 	Summer 2024
<ul style="list-style-type: none"> Jimena Guallar-Blasco <i>Undergrad/MS 2024 (JHU, Current: Charles River Analytics)</i> Outstanding Undergraduate Researcher Award, CRA (Honorable Mention) 	Summer 2020-Present
<ul style="list-style-type: none"> Maryam Hashemzadeh <i>Ph.D. Student (MILA)</i> 	Summer 2023
<ul style="list-style-type: none"> Zhuohong (Zooey) He <i>MSE, Spring 2021 (JHU, Current: Intuitive)</i> 	Winter 2021-Spring 2021
<ul style="list-style-type: none"> Chenyu (Heidi) Zhang <i>BS 2022, (Next: MS (Stanford), Current: Google Gemini)</i> 	Fall 2021-Fall 2022
<ul style="list-style-type: none"> Shalaka Vaidya <i>MS 2023 (NYU)</i> 	Fall 2022
<ul style="list-style-type: none"> Yi Zhou <i>MS 2022 (JHU)</i> 	Winter 2022-Fall 2022
<ul style="list-style-type: none"> Vicky Zeng <i>Ph.D. Student (JHU)</i> 	Winter 2021-Winter 2022

SKILLS

- Programming (expert):** Python
- Programming (proficient):** Bash, Java, Javascript
- Libraries/Frameworks:** PyTorch, AllenNLP, Transformers, NLTK, numpy, MechanicalTurk, networkx, MXNet, React

LANGUAGES

- Native:** English, German
- Fluent:** French
- Other:** Latin (reading/translation), Spanish (intermediate)

GRADUATE COURSES

- Natural Language Processing, Neural Networks for NLP, Deep Learning, Applied Machine Learning, Computational Linguistics, Causal Inference, Vision as Bayesian Inference, Parallel Programming, Software Testing and Debugging, Deep Learning for Automated Discourse, Nonlinear Optimization, Human-Computer Interaction