Elias Stengel-Eskin

Website: esteng.github.io
Email: esteng@cs.unc.edu
LinkedIn: elias-stengel-eskin
GitHub: github.com/esteng

EDUCATION

University of North Carolina, Chapel Hill — Chapel Hill, USA
Postdoctoral Research Associate – *Advisor: Mohit Bansal* — 2023 –current

Johns Hopkins University — Baltimore, USA
Ph.D. in Computer Science – *Advisor: Benjamin Van Durme* — 2018–2023
  - Ph.D. thesis: "Modeling Meaning for Description and Interaction"
  - supported by NSF Graduate Research Fellowship

Johns Hopkins University — Baltimore, USA
MSE in Computer Science – *Advisor: Benjamin Van Durme* — 2018–2021

McGill University — Montréal, Canada
Bachelor of Arts and Sciences in Cognitive Science — 2014–2018
  - Minor: Linguistics
  - First Class Honours
  - Honours thesis: "Variational Bayesian Inference for Unsupervised Lexicon Discovery" – *Advisor: Timothy O'Donnell*

EXPERIENCE

Microsoft Research — Montréal, Canada
PhD Research Intern – *Advisors: Marc-Alexandre Côté, Eric Yuan, Pierre-Yves Oudeyer* — March 2022-March 2023

Microsoft Research - Semantic Machines — Remote
PhD Research Intern – *Advisor: Yu Su* — Summer 2021

Montreal Computational and Quantitative Linguistics Lab — Montreal, Canada
Research Assistant – *Advisor: Morgan Sonderegger* — 2016-2018

PUBLICATIONS (PEER-REVIEWED)

[1] **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.

[2] 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.

[3] 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, pages 11 252–11 254.

[4]   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.

[5]   **Elias Stengel-Eskin**, Archiki Prasad, and Mohit Bansal, "ReGAL: Refactoring programs to discover generalizable abstractions", *The 41st International Conference on Machine Learning (ICML)*, 2024.

[6]   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.

[7]   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.

[8]   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.

[9]   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.

[10] 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.

[11] **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.

[12] 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.

[13] **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.

[14] **Elias Stengel-Eskin** and Benjamin Van Durme, "Calibrated Interpretation: Confidence Estimation in Semantic parsing", *Transactions of the Association for Computational Linguistics (TACL)*, 2023.

[15] **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.

[16] 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.

[17] **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.

[18] **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.

[19] 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.

[20] **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.

[21] 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.

[22] **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.

[23] **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.

[24] **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**.

[25] 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.

[26] **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.

[27] Aaron Steven White, **Elias Stengel-Eskin**, Siddharth Vashishtha, Venkata Subrahmanyan 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.

[28] **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.

[29] 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. **Elias Stengel-Eskin**, Peter Hase, Mohit Bansal, "Teaching Models to Balance Resisting and Accepting Persuasion" (2024), *Preprint*

2. David Wan, Justin Chih-Yao Chen, **Elias Stengel-Eskin**, Mohit Bansal, "MAMM-Refine: A Recipe for Improving Faithfulness in Generation with Multi-Agent Collaboration" (2024), *Preprint*

3. Zaid Khan, **Elias Stengel-Eskin**, Jaemin Cho, Mohit Bansal, "DataEnvGym: Data Generation Agents in Teacher Environments with Student Feedback" (2024), *Preprint*

4. Duy Nguyen, Archiki Prasad, **Elias Stengel-Eskin**, Mohit Bansal, "LASeR: Learning to Adaptively Select Reward Models with Multi-Armed Bandits" (2024), *Preprint*

5. Justin Chih-Yao Chen, Archiki Prasad, Swarnadeep Saha, **Elias Stengel-Eskin**, Mohit Bansal, "MAgICoRe: Multi-Agent, Iterative, Coarse-to-Fine Refinement for Reasoning" (2024), *Preprint*

6. Han Wang, Archiki Prasad, **Elias Stengel-Eskin**, Mohit Bansal, "AdaCAD: Adaptively Decoding to Balance Conflicts between Contextual and Parametric Knowledge" (2024), *Preprint*

7. Swarnadeep Saha, Archiki Prasad, Justin Chih-Yao Chen, Peter Hase, **Elias Stengel-Eskin**, Mohit Bansal, "System-1. x: Learning to Balance Fast and Slow Planning with Language Models" (2024), *Preprint*

8. Thomas Hofweber, Peter Hase, **Elias Stengel-Eskin**, Mohit Bansal, "Are language models rational? The case of coherence norms and belief revision" (2024), *Preprint*

9. Amith Ananthram, **Elias Stengel-Eskin**, Carl Vondrick, Mohit Bansal, Kathleen McKeown, "See It from My Perspective: Diagnosing the Western Cultural Bias of Large Vision-Language Models in Image Understanding" (2024), *Under Review*

10. Ziyang Wang*, Shoubin Yu*, **Elias Stengel-Eskin***, Jaehong Yoon, Feng Cheng, Gedas Bertasius, Mohit Bansal, "VideoTree: Adaptive Tree-based Video Representation for LLM Reasoning on Long Videos" (2024), *Under Review*

11. **Elias Stengel-Eskin**, "Modeling Meaning for Description and Interaction", (2023) **Ph.D. Thesis**

12. 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**

13. 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**

14. 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)

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

FUNDING

Received

Pending and Submitted

- **NSF HCC Medium** — Submitted
  Programmable Robot Macros in Mixed Reality
  Role: Postdoc
- **Cisco Gift** — Submitted
  Improving LLM Reliability and Trustworthiness via Overconfidence Reduction and Conversation
  Role: Co-PI

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

- **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

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
- **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)
- 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)
- Evan Paces-Wiles   Fall 2024-Present
  Undergrad (UNC)
- Jio Choi   Fall 2024-Present
  Undergrad (UNC)
- Aum Kendapadi   Summer 2024
  Undergrad (UNC)
- Jimena Guallar-Blasco   Summer 2020-Present
  Undergrad/MS 2024 (JHU, Current: Charles River Analytics)
- Maryam Hashemzadeh   Summer 2023
  Ph.D. Student (MILA)
- Zhuohong (Zooey) He   Winter 2021-Spring 2021
  MSE, Spring 2021 (JHU, Current: Intuitive)
- Chenyu (Heidi) Zhang   Fall 2021-Fall 2022
  BS 2022, (Current: MS at Stanford)
- Shalaka Vaidya   Fall 2022
  MS 2023 (NYU)
- Yi Zhou   Winter 2022-Fall 2022
  MS 2022 (JHU)
- Vicky Zeng   Winter 2021-Winter 2022
  Ph.D. Student (JHU)

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