

Yonatan Bisk

(Grounded) Natural Language Processing
Computer Science

✉ ybisk@cs.cmu.edu

Positions

- 2020 **Assistant Professor** *Carnegie Mellon University*
Language Technologies Institute
Robotics Institute (courtesy)
- ... **Visiting Researcher** *Microsoft Research* w/ *Jianfeng Gao*
- 2019 **Postdoctoral Scholar**
University of Washington & Allen Institute for Artificial Intelligence w/ *Yejin Choi*
Information Sciences Institute, University of Southern California w/ *Daniel Marcu*

Education

- 2015 **PhD in Computer Science** *The University of Illinois at Urbana-Champaign*,
Thesis: **Unsupervised Grammar Induction with Combinatory Categorical Grammars**
Advisor: Julia Hockenmaier
Committee: Jason Eisner, Dan Roth, ChengXiang Zhai
- 2009 **BS in Computer Science** *The University of Texas at Austin* Turing Scholar,
Thesis: The Necessity of Separating Control and Logic When Grounding Language using Neuroevolution
Advisor: Risto Miikkulainen Second Reader: Raymond Mooney

Students

- | | | | | |
|-----|------------------------|--|-----|--------|
| PhD | Hao Zhu | <i>Unsupervised structure induction and Theory of Mind</i> | LTI | 2019 – |
| PhD | Jared Fernandez | <i>Efficient Multimodal Models</i> | LTI | 2020 – |
| MLT | Josh Zhanson | <i>Visual Representations for Embodied Agents</i> | LTI | 2020 – |
| MLT | Yingshan Chang | <i>Multimodal Visual Reasoning</i> | LTI | 2020 – |
| PhD | Vidhi Jain | <i>Language to Control</i> | RI | 2021 – |
| PhD | Tiffany Min | <i>Knowledge for Embodied agents</i> | MLD | 2021 – |
| MS | Xiaoyu Zhang | <i>Robot Art</i> | 5th | 2021 – |

Professional Students

- | | | | | |
|------|----------------------------|--|----|--------|
| MRSD | Jashkumar Diyora | <i>Modular Teleoperation with Autonomy</i> | RI | 2021 – |
| MRSD | Shruti Gangopadhyay | <i>Modular Teleoperation with Autonomy</i> | RI | 2021 – |
| MRSD | Jigar Patel | <i>Modular Teleoperation with Autonomy</i> | RI | 2021 – |
| MRSD | Prakhar Pradeep | <i>Modular Teleoperation with Autonomy</i> | RI | 2021 – |
| MRSD | Shivani Sivakumar | <i>Modular Teleoperation with Autonomy</i> | RI | 2021 – |

Alumni and Interns

- | | | | |
|--------|------------------------|---------------------------------|------|
| Intern | Melanie Sclar | <i>Symmetric Theory-of-Mind</i> | 2021 |
| Intern | Blessing Bassey | <i>TextVQA</i> | 2021 |

Conference and Journal Publications

- 2021 **Dependency Induction Through the Lens of Visual Perception**
Ruisi Su, Shruti Rijhwani, Hao Zhu, Junxian He, Xinyu Wang, Yonatan Bisk, Graham Neubig,
The SIGNLL Conference on Computational Natural Language Learning

- 2021 **Language Grounding with 3D Objects**
Jesse Thomason, Mohit Shridhar, [Yonatan Bisk](#), Chris Paxton, Luke Zettlemoyer,
Conference on Robot Learning (CoRL)
- 2021 **TACo: Token-aware Cascade Contrastive Learning for Video-Text Alignment**
Jianwei Yang, [Yonatan Bisk](#), Jianfeng Gao,
International Conference on Computer Vision
- 2021 **Few-shot Language Coordination by Modeling Theory of Mind**
Hao Zhu, Graham Neubig, [Yonatan Bisk](#),
The Thirty-eighth International Conference on Machine Learning
- 2021 **Grounding ‘Grounding’ in NLP**
Khyathi Raghavi Chandu, [Yonatan Bisk](#), Alan W Black,
Findings of The 2021 Conference of the Association for Computational Linguistics
- 2021 **An Empirical Study on the Generalization Power of Neural Representations Learned via Visual Guessing Games**
Alessandro Suglia, [Yonatan Bisk](#), Ioannis Konstas, Antonio Vergari, Emanuele Bastianelli, Andrea Vanzo, Oliver Lemon,
The 2021 Conference of the European Chapter of the Association for Computational Linguistics, (Oral)
- 2021 **Knowledge-driven Data Construction for Zero-shot Evaluation in Commonsense Question Answering**
Kaixin Ma, Filip Ilievski, Jonathan Francis, [Yonatan Bisk](#), Eric Nyberg, Alessandro Oltramari,
35th AAAI Conference on Artificial Intelligence
- 2021 **ALFWorld: Aligning Text and Embodied Environments for Interactive Learning**
Mohit Shridhar, Xingdi Yuan, Marc-Alexandre Côté, [Yonatan Bisk](#), Adam Trischler, Matthew Hausknecht,
Proceedings of the International Conference on Learning Representations
- 2020 **Imagining Grounded Conceptual Representations from Perceptual Information in Situated Guessing Games**
Alessandro Suglia, Antonio Vergari, Ioannis Konstas, [Yonatan Bisk](#), Emanuele Bastianelli, Andrea Vanzo, Oliver Lemon,
The 28th International Conference on Computational Linguistics, (Oral)
- 2020 **The Return of Lexical Dependencies: Neural Lexicalized PCFGs**
Hao Zhu, [Yonatan Bisk](#), Graham Neubig,
Transactions of the Association for Computational Linguistics
- 2020 **Experience Grounds Language**
[Yonatan Bisk](#), Ari Holtzman, Jesse Thomason, Jacob Andreas, Yoshua Bengio, Joyce Chai, Mirella Lapata, Angeliki Lazaridou, Jonathan May, Aleksandr Nisnevich, Nicolas Pinto, Joseph Turian,
Proceedings of the 2020 Conference on Empirical Methods in Natural Language Processing (EMNLP), (Oral)
- 2020 **RMM: A Recursive Mental Model for Dialog Navigation**
Homero Roman Roman, [Yonatan Bisk](#), Jesse Thomason, Asli Celikyilmaz, Jianfeng Gao,
Proceedings of the 2020 Conference on Empirical Methods in Natural Language Processing: Findings
- 2020 **ALFRED: A Benchmark for Interpreting Grounded Instructions for Everyday Tasks**
Mohit Shridhar, Jesse Thomason, Daniel Gordon, [Yonatan Bisk](#), Winson Han, Roozbeh Mottaghi, Luke Zettlemoyer, Dieter Fox,
The IEEE Conference on Computer Vision and Pattern Recognition (CVPR)
- 2020 **PIQA: Reasoning about Physical Commonsense in Natural Language**
[Yonatan Bisk](#), Rowan Zellers, Ronan Le Bras, Jianfeng Gao, Yejin Choi,
Thirty-Fourth AAAI Conference on Artificial Intelligence, (Oral)
- 2019 **Robust Navigation with Language Pretraining and Stochastic Sampling**
Xiujuan Li, Chunyuan Li, Qiaolin Xia, [Yonatan Bisk](#), Asli Celikyilmaz, Jianfeng Gao, Noah A. Smith, Yejin Choi,
Conference on Empirical Methods in Natural Language Processing and 9th International Joint Conference on Natural Language Processing
- 2019 **Defending Against Neural Fake News**
Rowan Zellers, Ari Holtzman, Hannah Rashkin, [Yonatan Bisk](#), Ali Farhadi, Franziska Roesner, Yejin Choi,
Thirty-third Conference on Neural Information Processing Systems
- 2019 **Improving Robot Success Detection using Static Object Data**
Rosario Scalise, Jesse Thomason, [Yonatan Bisk](#), Siddhartha Srinivasa,
Proceedings of the 2019 IEEE/RSJ International Conference on Intelligent Robots and Systems
- 2019 **Early Fusion for Goal Directed Robotic Vision**
Aaron Walsman, [Yonatan Bisk](#), Saadia Gabriel, Dipendra Misra, Yoav Artzi, Yejin Choi, Dieter Fox,
Proceedings of the 2019 IEEE/RSJ International Conference on Intelligent Robots and Systems

- 2019 **HellaSwag: Can a Machine Really Finish Your Sentence?**
Rowan Zellers, Ari Holtzman, [Yonatan Bisk](#), Ali Farhadi, Yejin Choi,
Proceedings of the Association for Computational Linguistics
- 2019 **From Recognition to Cognition: Visual Commonsense Reasoning**
Rowan Zellers, [Yonatan Bisk](#), Ali Farhadi, Yejin Choi,
The IEEE Conference on Computer Vision and Pattern Recognition (CVPR), (Oral)
- 2019 **Tactical Rewind: Self-Correction via Backtracking in Vision-and-Language Navigation**
Liyiming Ke, Xiujuan Li, [Yonatan Bisk](#), Ari Holtzman, Zhe Gan, Jingjing Liu, Jianfeng Gao, Yejin Choi, Sid-
dhartha Srinivasa,
The IEEE Conference on Computer Vision and Pattern Recognition (CVPR), (Oral)
- 2019 **Prospection: Interpretable Plans From Language By Predicting the Future**
Chris Paxton, [Yonatan Bisk](#), Jesse Thomason, Arunkumar Byravan, Dieter Fox,
Proceedings of the International Conference on Robotics and Automation (ICRA)
- 2019 **Shifting the Baseline: Single Modality Performance on Visual Navigation & QA**
Jesse Thomason, Daniel Gordon, [Yonatan Bisk](#),
Proceedings of the Annual Conference of the North American Chapter of the Association for Computational Linguistics
- 2019 **Benchmarking Hierarchical Script Knowledge**
[Yonatan Bisk](#), Jan Buys, Karl Pichotta, Yejin Choi,
Proceedings of the Annual Conference of the North American Chapter of the Association for Computational Linguistics, (Oral)
- 2019 **Character-based Surprisal as a Model of Reading Difficulty in the Presence of Errors**
Michael Hahn, Frank Keller, [Yonatan Bisk](#), Yonatan Belinkov,
The 41st Annual Meeting of the Cognitive Science Society, (Oral)
- 2018 **SWAG: A Large-Scale Adversarial Dataset for Grounded Commonsense Inference**
Rowan Zellers, [Yonatan Bisk](#), Roy Schwartz, Yejin Choi,
Proceedings of the 2018 Conference on Empirical Methods in Natural Language Processing (EMNLP), (Oral)
- 2018 **Synthetic and Natural Noise Both Break Neural Machine Translation**
Yonatan Belinkov, [Yonatan Bisk](#),
Proceedings of the 6th International Conference on Learning Representations, (Oral)
- 2018 **Learning Interpretable Spatial Operations in a Rich 3D Blocks World**
[Yonatan Bisk](#), Kevin Shih, Yejin Choi, Daniel Marcu,
Proceedings of the Thirty-Second Conference on Artificial Intelligence (AAAI-18)
- 2017 **Natural Language Inference from Multiple Premises**
Alice Lai, [Yonatan Bisk](#), Julia Hockenmaier,
Proceedings of the Eighth International Joint Conference on Natural Language Processing, (Oral)
- 2016 **Natural Language Communication with Robots**
[Yonatan Bisk](#), Deniz Yuret, Daniel Marcu,
Proceedings of the 15th Annual Conference of the North American Chapter of the Association for Computational Linguistics, (Oral)
- 2016 **Supertagging with LSTMs**
Ashish Vaswani, [Yonatan Bisk](#), Kenji Sagae, Ryan Musa,
Proceedings of the 15th Annual Conference of the North American Chapter of the Association for Computational Linguistics (Short Papers), (Oral)
- 2016 **Evaluating Induced CCG Parsers on Grounded Semantic Parsing**
[Yonatan Bisk](#), Siva Reddy, John Blitzer, Julia Hockenmaier, Mark Steedman,
Proceedings of the 2016 Conference on Empirical Methods in Natural Language Processing
- 2015 **Probing the Linguistic Strengths and Limitations of Unsupervised Grammar Induction**
[Yonatan Bisk](#), Julia Hockenmaier,
Proceedings of the 53rd Annual Meeting of the Association for Computational Linguistics and the 7th International Joint Conference on Natural Language Processing (Volume 1: Long Papers), (Oral)
- 2015 **Labeled Grammar Induction with Minimal Supervision**
[Yonatan Bisk](#), Christos Christodoulopoulos, Julia Hockenmaier,
Proceedings of the 53rd Annual Meeting of the Association for Computational Linguistics and the 7th International Joint Conference on Natural Language Processing (Volume 2: Short Papers)
- 2013 **An HDP Model for Inducing Combinatory Categorical Grammars**
[Yonatan Bisk](#), Julia Hockenmaier,
Transactions of the Association for Computational Linguistics

- 2012 **Simple Robust Grammar Induction with Combinatory Categorical Grammar**
Yonatan Bisk, Julia Hockenmaier,
Proceedings of the Twenty-Sixth Conference on Artificial Intelligence (AAAI-12)
- 2012 **Document-Topic Hierarchies from Document Graphs**
Tim Wening, Yonatan Bisk, Jiawei Han,
Proceedings of the 21st ACM international conference on Information and knowledge management (CIKM 2012)
- 2010 **Normal-form parsing for CCGs with generalized composition and type-raising**
Julia Hockenmaier, Yonatan Bisk,
Proceedings of the 23rd International Conference on Computational Linguistics (Coling 2010)

Workshop Publications & Tech Reports

- 2021 **Learning When and What to Ask: a Hierarchical Reinforcement Learning Framework**
Khanh Nguyen, Yonatan Bisk, Hal Daume III,
ArXiv
- 2021 **FILM: Following Instructions in Language with Modular Methods**
So Yeon Min, Devendra Singh Chaplot, Pradeep Ravikumar, Yonatan Bisk, Ruslan Salakhutdinov,
ArXiv
- 2021 **WebQA: Multihop and Multimodal QA**
Yingshan Chang, Mridu Narang, Hisami Suzuki, Guihong Cao, Jianfeng Gao, Yonatan Bisk,
ArXiv
- 2021 **KB-VLP: Knowledge Based Vision and Language Pretraining**
Kezhen Chen, Qiuyuan Huang, Yonatan Bisk, Daniel McDuff, Jianfeng Gao,
ICML21 Workshop on Self-Supervised Learning
- 2021 **Worst of Both Worlds: Biases Compound in Pre-trained Vision-and-Language Models**
Tejas Srinivasan, Yonatan Bisk,
ArXiv
- 2020 **A Benchmark for Structured Procedural Knowledge Extraction from Cooking Videos**
Frank F. Xu, Lei Ji, Botian Shi, Junyi Du, Graham Neubig, Yonatan Bisk, Nan Duan,
Workshop on NLP Beyond Text
- 2020 **Multi-View Learning for Vision-and-Language Navigation**
Qiaolin Xia, Xiujun Li, Chunyuan Li, Yonatan Bisk, Zhifang Sui, Jianfeng Gao, Yejin Choi, Noah A. Smith,
ArXiv
- 2019 **FIND: Identifying Functionally and Structurally Important Features in Protein Sequences with Deep Neural Networks**
Ranjani Murali, James Hemp, Victoria Orphan, Yonatan Bisk,
bioRxiv
- 2018 **Inducing Grammars with and for Neural Machine Translation**
Ke Tran, Yonatan Bisk,
Proceedings of the 2nd Workshop on Neural Machine Translation
- 2018 **Bridging HMMs and RNNs through Architectural Transformations**
Jan Buys, Yonatan Bisk, Yejin Choi,
32nd Conference on Neural Information Processing Systems (NIPS 2018), IRASL workshop
- 2018 **CHALET: Cornell House Agent Learning Environment**
Claudia Yan, Dipendra Misra, Andrew Bennett, Aaron Walsman, Yonatan Bisk, Yoav Artzi,
ArXiv Preprint 1801.07357
- 2016 **Towards a Dataset for Human Computer Communication via Grounded Language Acquisition**
Yonatan Bisk, Daniel Marcu, William Wong,
Proceedings of the AAAI 2016 Workshop on Symbiotic Cognitive Systems
- 2016 **Unsupervised Neural Hidden Markov Models**
Ke Tran, Yonatan Bisk, Ashish Vaswani, Daniel Marcu, Kevin Knight,
Proceedings of the Workshop on Structured Prediction for NLP, (Oral)
- 2012 **Induction of Linguistic Structure with Combinatory Categorical Grammars**
Yonatan Bisk, Julia Hockenmaier,
NAACL HLT Workshop on Induction of Linguistic Structure

Thesis Committees

- **PhD Shikib Mehri**

Maxine Eskenazi , CMU

- **PhD** *Volkan Cirik* Louis-Philippe Morency and Taylor Berg-Kirkpatrick, CMU
- **PhD** *Shruti Palaskar* Alan Black and Florian Metze, CMU
- **PhD** *Dheeraj Rajagopal* Ed Hovy, CMU
- **PhD** *Evangelia Spiliopoulou* Ed Hovy, CMU
- 2021 **PhD** *Pengcheng Yin* Graham Neubig, CMU
- 2020 **PhD** *Zihang Dai* Yiming Yang, CMU
- 2021 **MLT** *Jing Wen* Katerina Fragkiadaki, CMU
- 2021 **Qual** *Mohit Sharma* Oliver Kroemer, CMU

Teaching

- 2021 **11-767 On-Device Machine Learning** *Co-Emma Strubell* # Students: 31, Fall
- 2021 **11-777 MultiModal Machine Learning** # Students: 42, Spring

Diversity and Inclusion

- 2021 **NAACL 2022 DEI Co-Chair**, ongoing
- 2020 **LTI DEI Committee**, ongoing
- 2019 **CrashCourse AI** Educational YouTube series targeted at high-school age viewers. Hosted by Jabril Ashe. Co-Written with Lana Yarosh and Tim Weninger, 1yr
- 2018 **ACM Council on Diversity & Inclusion** Investigating and initiating institutional change within ACM on behalf of underrepresented groups., 1yr
 - **Grace Hopper PC member** Review submissions to AI Technical Track, 1yr
- 2016 **NCWIT Collegiate Award** Review applications for the National Center for Women & Information Technology's Collegiate Award honoring college women, ISI 3yrs
- 2009 **NCWIT Aspirations in Computing** Review applications for the National Center for Women & Information Technology's Award for Aspirations in Computing which supports high-school girls interested in CS, UIUC, ISI 6yrs
 - **Tech Junket/Women in CS** Outreach for local Urbana-Champaign pre-college students, UIUC 2yrs
- 2008 **Freshman Research Mentor** Mentored students to perform research, UTexas 1yr
 - **First Bytes** Helped organize a summer camp for girls interested in CS, UTexas
 - **Co-Founded Breakfast Bytes** Professor talks for pre-college students, UTexas 1yr
 - **CS Roadshow** CS presentations at Austin middle and high schools, UTexas 1yr

Funding and Awards

- 2021 **NSF EAGER**
Co-PI Graham Neubig, Dan Yurovsky, Aug 2021 – Dec 2022, \$300K
- **LTI Junior Chair**, Aug 2021 – Aug 2023
- 2020 **Facebook RFP** *Learning Dynamic Multimodal Inference for On-Device VQA*
Co-PI Emma Strubell, Sept 2020 – May 2021, \$75K
- 2020 **Google exploreCSR** *Broad & Inclusive Language Technology (BILT) @ CMU LTI*
Co-PI Emma Strubell, Graham Neubig, Summer 2021, \$15k

Organization (Workshops and Conference)

- 2021 **Workshop** *Embodied AI Workshop – Challenge Organizer*
Computer Vision and Pattern Recognition
- 2020 **Workshop** *Embodied Vision, Actions & Language Workshop*
European Conference on Computer Vision
 - **Workshop** *Workshop on Dataset Curation and Security*
NeurIPS
- 2019 **Workshop** *Spatial Language Understanding and Grounded communication for Robotics*
North American Chapter of the Association for Computational Linguistics

- 2018 **Conference Social Media Chair**
North American Chapter of the Association for Computational Linguistics
- **Workshop *Generalization in the Age of Deep Learning***
North American Chapter of the Association for Computational Linguistics
 - **Workshop *Wordplay: Reinforcement and Language Learning in Text-Based Games*** NeurIPS
- 2017 **Conference Student Scholarship Chair and Student Volunteer Coordinator**
Conference on Empirical Methods in Natural Language Processing
- **Workshop *Language Grounding for Robotics***
Conference of the Association for Computational Linguistics

Area Chair

- 2022 **International Conference on Learning Representations**
- **Association for the Advancement of Artificial Intelligence Senior Meta-Reviewer**
- 2021 **International Conference on Learning Representations**
- **Association for Computational Linguistics Machine Learning**
 - **Empirical Methods in Natural Language Processing Speech, Vision, Robotics, Multimodal Grounding**
 - **Neural Information Processing Systems (NeurIPS)**
 - **ACL Rolling Review**
- 2020 **Association for Computational Linguistics Language Grounding to Vision, Robotics and Beyond**
- **Neural Information Processing Systems (NeurIPS)**
 - **Asia-Pacific chapter of the Association for Computational Linguistics**
- 2019 **Association for Computational Linguistics Vision, Robotics, Multimodal Grounding, and Speech**
- 2018 **International Conference on Computational Linguistics**
- 2016 **Conference on Lexical and Computational Semantics (*SEM) Sem. Parsing and Role Labeling**

Reviewer

NLP	ARR	Association for Computational Linguistics Rolling Review	2021
	ACL	Association for Computational Linguistics	2017, 2018
	CL	Computational Linguistics Journal	2017, standing
	CoLing	International Conference on Computational Linguistics	2016
	CoNLL	Conference on Computational Natural Language Learning	2016 – 2018
	EACL	European Chapter of the Association for Computational Linguistics	2014, 2017, 2020
	EMNLP	Empirical Methods in Natural Language Processing	2013 – 2020
	IJCNLP	International Joint Conference on Natural Language Processing	2017
	NAACL	N. American Chapter of the Association for Computational Ling	2016 – 2019
	NLE	Natural Language Engineering Journal	2016
	*SEM	Joint Conference on Lexical and Computational Semantics	2020
Robo	TACL	Transactions of the Assoc. for Computational Linguistics	2019
	CoRL	Conference on Robot Learning	2019 – 2021
	HRI	Human Robot Interaction	2020 – 2022
	ICRA	International Conference on Robotics and Automation	2019
	IJRR	International Journal of Robotics Research	2017
	IROS	IEEE/RSJ International Conference on Intelligent Robots and Systems	2019
	RA-L	IEEE Robotics and Automation Letters	2019
AI/ML	AAAI	Association for the Advancement of Artificial Intelligence	2018, 2021
	ICLR	International Conference on Learning Representations	2019 – 2020
	ICML	International Conference on Machine Learning	2019
	IJCAI	International Joint Conference on Artificial Intelligence	2019
	NeurIPS	Neural Information Processing Systems	2018 – 2019

Invitations and Talks

- 2021 **Following Instructions and Asking Questions** *UIUC NLP*
WebQA: Multihop and Multimodal QA *PNNL Mega-AI Seminar*
Following Instructions and Asking Questions *Human Interaction for Robotic Navigation Workshop @ ICCV*
WebQA: Multihop and Multimodal *Microsoft Research Summit*
2nd Workshop on Advances in Language and Vision Research (ALVR) *NAACL*
Instructions, Abstraction, and Theory-of-Mind *KoUniversity AI center*
Understanding the Potential of Scaling Artificial Intelligence for Science Applications Panel *PNNL*
Guest Lecture: Embodiment for NLP *UPenn*
Guest Lecture: Multimodality in NLP *UWashington Linguistics*
- 2020 **The 2nd Workshop Beyond Vision and Language: Integrating Real-world Knowledge** *CoLing*
The University of Texas at Austin – Forum for AI
Cornell Learning Machines seminar
Stanford NLP seminar
SRI Center for Vision Technology Lab Panel *Embodied AI*
- 2018 **Colloquium Talk** *Northwest NLP*
- 2017 **Invited Talk** *University of Notre Dame NLP Seminar*
Invited Talk *University of California, Irvine AI/ML Seminar*
Invited Talk *Pacific Northwest National Laboratory*
- 2016 **Invited Poster** *The Impact of Computing in Our Physical World session of the CRA's Computing Community Consortium (CCC) Symposium on Computing Research*
- 2015 **Colloquium Talk** *Toyota Tech. Inst. of Chicago's Midwest Speech & Language Days*
- 2013 **Colloquium Talk** *Toyota Tech. Inst. of Chicago's Midwest Speech & Language Days*