

# Yonatan Bisk

(Grounded) Natural Language Processing  
Computer Science

✉ ybisk@cs.cmu.edu

## Positions

- 2020 **Assistant Professor**, *Carnegie Mellon University*  
Language Technologies Institute (primary) & 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

## Conference and Journal Publications

- 2020 **The Return of Lexical Dependencies: Neural Lexicalized PCFGs**  
Hao Zhu, Yonatan Bisk, & Graham Neubig,  
*Transactions of the Association for Computational Linguistics*
- **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)*
  - **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 (AAAI-20)*, (Oral)
- 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 (NeurIPS)*
- **Robust Navigation with Language Pre-training and Stochastic Sampling**  
Xiujun 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 (EMNLP-IJCNLP)*
  - **Improving Robot Success Detection using Static Object Data**  
Rosario Scalise, Jesse Thomason, Yonatan Bisk, and Siddhartha Srinivasa,  
*IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*
  - **Early Fusion for Goal Directed Robotic Vision**  
Aaron Walsman, Yonatan Bisk, Saadia Gabriel, Dipendra Misra, Yoav Artzi, Yejin Choi, and Dieter Fox,  
*IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, (RoboCup Best Paper finalist)
  - **HellaSwag: Can a Machine Really Finish Your Sentence?**  
Rowan Zellers, Ari Holtzman, Yonatan Bisk, Ali Farhadi and Yejin Choi,  
*Proc of the 2019 Conference of the Association for Computational Linguistics (ACL)*
  - **From Recognition to Cognition: Visual Commonsense Reasoning**  
Rowan Zellers, Yonatan Bisk, Ali Farhadi and Yejin Choi,  
*The IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Oral

- **Tactical Rewind: Self-Correction via Backtracking in Vision-and-Language Navigation**  
Liyiming Ke, Xiujun Li, [Yonatan Bisk](#), Ari Holtzman, Zhe Gan, Jingjing Liu, Jianfeng Gao, Yejin Choi and Siddhartha Srinivasa,  
*The IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Oral
- **Prospection: Interpretable Plans From Language By Predicting the Future**  
Chris Paxton, [Yonatan Bisk](#), Jesse Thomason, Arunkumar Byravan, and Dieter Fox,  
*International Conference on Robotics and Automation (ICRA)*
- **Shifting the Baseline: Single Modality Performance on Visual Navigation & QA**  
Jesse Thomason, Daniel Gordon, and [Yonatan Bisk](#),  
*Conference of the North American Chapter of the Association for Computational Linguistics (Short)*
- **Benchmarking Hierarchical Script Knowledge**  
[Yonatan Bisk](#), Jan Buys, Karl Pichotta, and Yejin Choi,  
*Conference of the North American Chapter of the Association for Computational Linguistics (Short)*, Oral
- **Character-based Surprisal as a Model of Human Reading in the Presence of Errors**  
Michael Hahn, Frank Keller, [Yonatan Bisk](#), and 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 and Yejin Choi,  
*Proceedings of the 2018 Conference on Empirical Methods in Natural Language Processing (EMNLP)*, Oral
- **Synthetic and Natural Noise Both Break Neural Machine Translation**  
Yonatan Belinkov and [Yonatan Bisk](#),  
*Proceedings of the 6th International Conference on Learning Representations (ICLR)*, Oral
- **Learning Interpretable Spatial Operations in a Rich 3D Blocks World**  
[Yonatan Bisk](#), Kevin Shih, Yejin Choi and Daniel Marcu,  
*Proceedings of the Thirty-Second Conference on Artificial Intelligence (AAAI-18)*
- 2017 **Natural Language Inference from Multiple Premises**  
Alice Lai, [Yonatan Bisk](#), and Julia Hockenmaier,  
*Proceedings of the Eighth International Joint Conference on Natural Language Processing*, Oral
- 2016 **Evaluating Induced CCG Parsers on Grounded Semantic Parsing**  
[Yonatan Bisk](#), Siva Reddy, John Blitzer, Julia Hockenmaier and Mark Steedman,  
*Proceedings of the 2016 Conference on Empirical Methods in Natural Language Processing*, pp 2022 – 2027
- **Natural Language Communication with Robots**  
[Yonatan Bisk](#), Deniz Yuret and Daniel Marcu,  
*Proceedings of the 2016 Conference of the North American Chapter of the Association for Computational Linguistics*, pp 751 – 761, Oral
- **Supertagging With LSTMs**  
Ashish Vaswani, [Yonatan Bisk](#), Kenji Sagae and Ryan Musa,  
*Proceedings of the 2016 Conference of the North American Chapter of the Association for Computational Linguistics (Short Papers)*, pp 232–237, Oral
- 2015 **Probing the Linguistic Strengths and Limitations of Unsupervised Grammar Induction**  
[Yonatan Bisk](#) and Julia Hockenmaier,  
*Proc 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)*, pp 1395 – 1404, Oral
- **Labeled Grammar Induction with Minimal Supervision**  
[Yonatan Bisk](#), Christos Christodoulopoulos and 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)*, pp 870 – 876
- 2013 **An HDP Model for Inducing Combinatory Categorical Grammars**  
[Yonatan Bisk](#) and Julia Hockenmaier,  
*Transactions of the Association for Computational Linguistics*, Vol 1, pp 75-88
- 2012 **Simple Robust Grammar Induction with Combinatory Categorical Grammars**  
[Yonatan Bisk](#) and Julia Hockenmaier,  
*Proceedings of the Twenty-Sixth Conference on Artificial Intelligence (AAAI-12)*, pp 1643–1649
- **Document-Topic Hierarchies from Document Graphs**  
Tim Wenginger, [Yonatan Bisk](#) and Jiawei Han,  
*Proceedings of the 21st ACM International Conference on Information and Knowledge Management (CIKM)*

- 2010 **Normal-form parsing for Combinatory Categorical Grammars with generalized composition and type-raising**  
Julia Hockenmaier and Yonatan Bisk,  
*Proceedings of the 23rd International Conference on Computational Linguistics (Coling 2010)*, pp 465–473

## Workshop Publications & Tech Reports

- 2018 **Inducing Grammars with and for Neural Machine Translation**  
Ke Tran and Yonatan Bisk,  
*Workshop on Neural Machine Translation*, Best paper - Oral
- **Bridging HMMs and RNNs Through Architectural Transformations**  
Jan Buys, Yonatan Bisk, and Yejin Choi,  
*Interpretability and Robustness in Audio, Speech, and Language Workshop @ NeurIPS*
  - **CHALET: Cornell House Agent Learning Environment**  
Claudia Yan, Dipendra Misra, Andrew Bennet, Aaron Walsman, Yonatan Bisk and Yoav Artzi,  
*ArXiv*
- 2016 **Unsupervised Neural Hidden Markov Models**  
Ke Tran, Yonatan Bisk, Ashish Vaswani, Daniel Marcu and Kevin Knight,  
*Proceedings of the Workshop on Structured Prediction for NLP*, pp 63–71, Oral
- **Towards a Dataset for Human Computer Communication via Grounded Language Acquisition**  
Yonatan Bisk, Daniel Marcu and William Wong,  
*Proceedings of the AAAI 2016 Workshop on Symbiotic Cognitive Systems*, pp 729 – 732
- 2012 **Induction of Linguistic Structure with Combinatory Categorical Grammars**  
Yonatan Bisk and Julia Hockenmaier,  
*NAACL HLT Workshop on Inducing Linguistic Structure*, pp 90–95

## Funding and Awards

- 2020 **Facebook RFP**, *Learning Dynamic Multimodal Inference for On-Device VQA*,  
Co-PI Emma Strubell, Sept 2020 – May 2021, \$75K

## Students

- PhD **Hao Zhu**, *Unsupervised structure induction and Theory of Mind*, 2019 –  
PhD **Jared Fernandez**, *Efficient Multimodal Models*, 2020 –  
MLT **Josh Zhanson**, *Embodied Agents*, 2020 –

## Organization (Workshops and Conference)

- 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

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

## Diversity and Inclusion

- 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

## Invitations and Talks

- 2020 **The 2nd Workshop Beyond Vision and Language: Integrating Real-world Knowledge**, *CoLing*  
**Semantic Policy and Action Representation for Autonomous Robots (SPAR) Workshop**, *IROS*
- 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*