# Jack Hessel

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## Education

**Ph.D., Computer Science**
Cornell University
August 2014 - August 2020
*Advised by Professor Lillian Lee*
*Natural Language Processing and Machine Learning*
*Thesis: Learning from Multimodal Web Data*

**B.A., Computer Science and Math/Statistics**
Carleton College
September 2010 - June 2014
*Magna Cum Laude*
*Honors in Computer Science*

## Publications

*Refereed Conference Publications*

**Jack Hessel**, Lillian Lee, and David Mimno. "Unsupervised Discovery of Multimodal Links in Multi-image, Multi-sentence Documents." EMNLP 2019.

**Jack Hessel**, Bo Pang, Zhenhai Zhu, and Radu Soricut. "A Case Study on Combining ASR and Visual Features for Generating Instructional Video Captions" CoNLL 2019.

**Jack Hessel**, and Lillian Lee. "Something's Brewing! Early Prediction of Controversy-causing Posts from Discussion Features." NAACL 2019.

**Jack Hessel**, David Mimno, and Lillian Lee. "Quantifying the Visual Concreteness of Words and Topics in Multimodal Datasets." NAACL 2018.

**Jack Hessel**, Lillian Lee, and David Mimno. "Cats and Captions vs. Creators and the Clock: Comparing Multimodal Content to Context in Predicting Relative Popularity" WWW 2017.

**Jack Hessel**, Chenhao Tan and Lillian Lee. "Science, AskScience and BadScience: On the Coexistence of Highly Related Communities." ICWSM 2016.

**Jack Hessel**, and Sherri Goings. "Using Reproductive Altruism to Evolve Multicellularity in Digital Organisms." ECAL 2013.

*Refereed Workshop Publications*

**Jack Hessel**, and David Mimno. "Aligning Images and Text in a Digital Library." Computer Vision in Digital Humanities Workshop @ DH 2017.

**Jack Hessel**, Alexandra Schofield, Lillian Lee, and David Mimno. "What do Vegans do in their Spare Time? Latent Interest Detection in Multi-Community Networks." Networks Workshop @ NeurIPS 2015.

**Jack Hessel**, Nicolas Savva, and Kimberly J Wilber. "Image Representations and New Domains in Neural Image Captioning." Vision/Language Workshop @ EMNLP 2015.

Albright, Evan, **Jack Hessel**, Nao Hiranuma, Cody Wang, and Sherri Goings. "A Comparative Analysis of Popular Phylogenetic Reconstruction Algorithms." MICS 2014.

# Employment

*Research*

**Postdoctoral Young Investigator,** *Allen Institute for Artificial Intelligence*                                    Starting: Fall 2020
Host: Yejin Choi.
Working on commonsense reasoning, vision and language, etc.

**Research Intern,** *Google Research*                                    Summer 2019, Summer 2018
Hosts: Bo Pang and Zhenhai Zhu.
Worked with the natural language understanding team on video language joint learning: this work was published at *CoNLL, 2019* and follow up work is in submission.

**Research Intern,** *Facebook, Inc.*                                    Summer 2017
Host: Amit Bahl.
Worked with the Core Data Science team on personalized language modeling, and cross-modal retrieval.

**Research Intern,** *Twitter, Inc.*                                    Summer 2016
Host: Clément Farabet.
Worked with the Cortex Team as their first intern on large-scale/multimodal node embeddings in graphs, language modeling, and engagement prediction.

**Student Researcher,** *Washington University, St. Louis REU*                                    Summer 2013
Host: Kilian Weinberger.
Contributed to a GPU support vector machine package that accompanies Tyree et al.'s "Parallel Support Vector Machines in Practice." 2014.

*Teaching*

**Invited Visiting Instructor,** *Computer Science Dept., Carleton College*                                    Spring 2019
Lead instructor of Natural Language Processing and Mathematics of Computer Science; 30+ students in each class

**Teaching Assistant,** *Cornell University*                                    Various
Language and Information, 2016; Machine Learning for Data Science, 2015; Intro to Computer Graphics, 2014

# Honors, Invited Talks, and Grants

*Academic Honors*

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|---|---|
| Top Reviewer Recognition<br>ACL 2018, EMNLP 2018+2019, CoNLL 2019 | Various |
| Pitt Digital Humanities graduate speaker series speaker | 2018 |
| MICS Conference Best Paper Award | 2014 |
| Phi Beta Kappa, Beta of Minnesota | 2014 |
| Sigma Xi Inductee, Carleton College Chapter | 2014 |

*Invited Talks*

| | |
|---|---|
| *Allen Institute for AI:* "The Promise and Perils of Learning Grounding from Visual-Textual Web Data." | 2020 |
| *UNC Chapel Hill:* "The Promise and Perils of Learning Grounding from Visual-Textual Web Data." | 2020 |
| *Rutgers University:* "Multimodal Grounding from User-generated Web Content." | 2019 |
| *SRI International:* "Multimodal Grounding from User-generated Web Content." | 2019 |
| *Cornell University:* PhD Colloquium, "Unsupervised Learning From Multimodal Documents." | 2019 |
| *University of Pittsburgh:* "Grounding Images from a Digital Library in their Textual Contexts." | 2018 |
| *Cornell University:* Two Guest Lectures for CS4300, "Practical Unsupervised Learning" | 2015 |
| *Carleton College:* "The Role of Altruism on Kickstarter" | 2014 |

*Grants*

Zillow Data Science Grant (with David Mimno: $85K)                                                    2018

Nvidia Hardware Grants (with David Mimno and Lillian Lee)                                   2018, 2015

# Service

*Program Committees/Reviewing*

**Conference/Journal Reviewer**

ACL 2016, 2017, 2018, 2019, 2020
EMNLP 2017, 2018, 2019, 2020
ICML 2020
NAACL 2018, 2019
AACL 2020
CoNLL 2019, 2020
JAIR 2020
PLOS One 2020
ICWSM 2018
EACL 2017, 2021
AAAI 2017

**Workshop Reviewer**

Black in AI @ NeurIPS: 2017, 2018, 2019
Student Research Workshop @ NAACL: 2018
Student Research Workshop @ ACL: 2020
Noisy User-generated Text @ EMNLP: 2018, 2019, 2020
Practical ML 4 the Developing World @ ICLR: 2020

*Volunteer Service*

**Lesson Planner and Volunteer,** *Expand Your Horizons @ Cornell*                          Spring 2015, 2014
Planned for and taught at a one-day conference for 7th-9th grade girls to encourage interest in math and science.

**Volunteer Elementary School Teacher,**                                                             Fall 2014
Volunteered once per week teaching 2-5th grade students how to code using code.org

# Development Experience

*Open Source Contributions*

Developed a TreeLSTM in `TensorFlow2`: this neural network dynamically changes its topology based on a per-example basis (`https://github.com/jmhessel/recursive_nn_tf2`)

Developed `fmpytorch` in 2017 (150+ stars on GitHub): a cythonized implementation of second order factorization machines in `pytorch` (`https://github.com/jmhessel/fmpytorch`)

Developed `fightingwords` in 2015 for comparing word usage rate differences between corpora; used in several refereed publications (`https://github.com/jmhessel/FightingWords`)

Pull request contributions merged to *Keras* and *Gensim*

*Technical Skills*

*Machine Learning Skills:* Various machine learning/statistical toolkits/languages (e.g. sklearn, Tensorflow, PyTorch, R, etc.). Experience working with large, multi-faceted datasets.

*Development Skills:* Object-oriented programming (Python, Java, C++), parallel programming experience on CPUs/Nvidia GPUs, experience with various languages, development environments, version control systems, operating systems.

# References

Available upon request