

NAOMI SAPHRA

Curriculum Vitae

Center for Data Science
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Education

- 2021 **Ph.D, Informatics**, *University of Edinburgh*, Edinburgh, UK.
Advisors: Adam Lopez (primary) and Tim Hospedales
Thesis: Training Dynamics of Neural Language Models.
- 2015 **MSE, Computer Science**, *Johns Hopkins University*, Baltimore, MD.
Mentors: Adam Lopez, Sanjeev Khudanpur, Raman Arora
Obtained as a PhD student before transferring to Edinburgh.
- 2013 **B.Sc, Computer Science**, *Carnegie Mellon University*, Pittsburgh, PA.
Mentors: Noah Smith and Chris Dyer
Minor: Language Technologies
- Spring 2017 **Sabbatical**, *The Recurse Center*, New York, NY.
Experimental unstructured educational programming retreat.

Work

- 2021–Present **NYU**, *Postdoctoral Researcher*, New York, NY.
Supervisor: Prof. Kyunghyun Cho.
Served as lead senior author on several student projects.
- 2022–Present **MosaicML**, *Consultant*, New York, NY.
Advised teams improving the efficiency of the pretraining large language models.
- Winter 2020 **Google**, *Research Intern*, New York, NY.
Mentors: Dipanjan Das, Ian Tenney, Jasmijn Bastings, Thibault Sellam.
Led project on variance across pretraining runs that resulted in an ICLR paper.
- Summer 2017 **Koko**, *Contractor*, New York, NY.
Developed classifiers for informal text at abuse-detection startup.
- Summer 2015 **Google**, *Software Engineering Intern*, Mountain View, CA.
Mentor: Marius Pasca (Common Sense Team, Machine Intelligence).
Project: Unsupervised discovery of paraphrases pairs.
- Summer 2012 **Frederick Jelinek Memorial Workshop at Charles University**, *Graduate Researcher*, Prague, Czech Republic.
Led project on abstract meaning representations that resulted in a NAACL demo paper.
- Summer 2013 **Google**, *Software Engineering Intern*, Mountain View, CA.
Mentor: Eric Altendorf (Common Sense Team, Machine Intelligence).
Project: Integrating models of real-world knowledge into entity linking systems.
- Summer 2012 **CLSP Summer Workshop at Johns Hopkins University**, *Undergraduate Research Fellow*, Baltimore, MD.
Mentor: Matthew Blaschko.
Selected from a competitive undergraduate pool.
Contributed to a CVPR paper.
- Summer 2011 **Facebook, Inc.**, *Engineering Intern*, Palo Alto, CA.
- 2010-2013 **Carnegie Mellon University**, *Undergraduate Research Assistant*, Pittsburgh, PA.
Mentors: Chris Dyer and Noah Smith.
Contributed to an ACL workshop paper.

Publications (h-index: 10)

Conference Publications

- 2022 Josef Valvoda, **Naomi Saphra**, Jonathan Rawski, Ryan Cotterell, and Adina Williams. Learning Transductions to Test Systematic Compositionality. In *International Conference on Computational Linguistics (COLING)*, 2022.
- 2022 Thibault Sellam, Steve Yadlowsky, Ian Tenney, Jason Wei, **Naomi Saphra**, Alexander D'Amour, Tal Linzen, Jasmijn Bastings, Iulia Raluca Turc, Jacob Eisenstein, Dipanjan Das, and Ellie Pavlick. The MultiBERTs: BERT Reproductions for Robustness Analysis. In *International Conference on Learning Representations (ICLR)*, 2022.
- 2021 Jennifer C. White, Tiago Pimentel, **Naomi Saphra**, Adina Williams, and Ryan Cotterell. A Non-Linear structural probe. In *North American Association for Computational Linguistics (NAACL)*, 2021.
- 2020 **Naomi Saphra** and Adam Lopez. LSTMs Compose—and Learn—Bottom-Up. In *Findings of Empirical Methods in Natural Language Processing (EMNLP)*, 2020.
- 2020 Mohammad Tahaei, Kami Vaniea, and **Naomi Saphra**. Understanding privacy-related questions on stack overflow. In *Conference on Human Factors in Computing Systems (CHI)*, 2020.
- 2020 Tiago Pimentel*, **Naomi Saphra*** (equal contribution), Adina Williams, and Ryan Cotterell. Pareto Probing: Trading Off Accuracy for Complexity. In *Empirical Methods in Natural Language Processing (EMNLP)*, 2020.
- 2019 **Naomi Saphra** and Adam Lopez. Understanding Learning Dynamics Of Language Models with SVCCA. In *North American Association for Computational Linguistics (NAACL)*, 2019.
- 2015 **Saphra, Naomi** and Adam Lopez. AMRICA: an AMR Inspector for Cross-language Alignments. In *North American Association for Computational Linguistics (NAACL) (demos)*, 2015.
- 2014 Andrea Vedaldi, Siddharth Mahendran, Stavros Tsogkas, Subhransu Maji, Ross Girshick, Juho Kannala, Esa Rahtu, Iasonas Kokkinos, Matthew B. Blaschko, David Weiss, Ben Taskar, Karen Simonyan, **Naomi Saphra**, and Sammy Mohamed. Understanding Objects in Detail with Fine-grained Attributes. In *Computer Vision and Pattern Recognition (CVPR)*, 2014.

Workshop Publications

- 2022 Bingchen Zhao, Yuling Gu, Jessica Zosa Forde, and **Naomi Saphra**. One Venue, Two Conferences: The Separation of Chinese and American Citation Networks. In *NeurIPS Workshop on Cultures of AI and AI for Culture*, October 2022.
- 2022 Jeevesh Juneja, Rachit Bansal, Kyunghyun Cho, João Sedoc, and **Naomi Saphra**. Linear Connectivity Reveals Generalization Strategies. In *ICML Workshop on Spurious Correlations, Invariance and Stability (SCIS)*, July 2022.
- 2019 **Saphra, Naomi** and Adam Lopez. Sparsity emerges naturally in neural language models. In *ICML Workshop on Identifying and Understanding Deep Learning Phenomena (Deep Phenomena)*, 2019.
- 2016 **Naomi Saphra** and Adam Lopez. Evaluating Informal-Domain Word Representations With UrbanDictionary. In *ACL Workshop on Evaluating Vector Space Representations for NLP (RepEval)*, 2016.
- 2014 Nathan Schneider, Brendan O'Connor, **Naomi Saphra**, David Bamman, Manaal Faruqui, Noah A. Smith, Chris Dyer, and Jason Baldridge. A framework for (under) specifying dependency syntax without overloading annotators. In *ACL Linguistic Annotation Workshop*, 2014.
- 2014 Ryan Cotterell, Adithya Renduchintala, **Naomi Saphra**, and Chris Callison-Burch. An Algerian Arabic-French Code-Switched Corpus. In *LREC Workshop on Free/Open-Source Arabic Corpora*, 2014.

Preprints and Works Under Submission

- 2022 Jeevesh Juneja, Rachit Bansal, Kyunghyun Cho, João Sedoc, and **Naomi Saphra**. Linear Connectivity Reveals Generalization Strategies. *arXiv preprint arXiv:2205.12411*, 2022.
- 2022 Dieuwke Hupkes, Mario Giulianelli, Verna Dankers, Mikel Artetxe, Yanai Elazar, Tiago Pimentel, Christos Christodoulopoulos, Karim Lasri, **Naomi Saphra**, Arabella Sinclair, Dennis Ulmer, Florian Schottnann, Khuyagbaatar Batsuren, Kaiser Sun, Koustuv Sinha, Leila Khalatbari, Maria Ryskina, Rita Frieske, Ryan Cotterell, and Zhijing Jin. State-of-the-art generalisation research in NLP: a taxonomy and review. *arXiv preprint arXiv:2210.03050*, 2022.
- 2017 Graham Neubig, Chris Dyer, Yoav Goldberg, Austin Matthews, Waleed Ammar, Antonios Anastasopoulos, Miguel Ballesteros, David Chiang, Daniel Clothiaux, Trevor Cohn, Kevin Duh, Manaal Faruqi, Cynthia Gan, Dan Garrette, Yangfeng Ji, Lingpeng Kong, Adhiguna Kuncoro, Gaurav Kumar, Chaitanya Malaviya, Paul Michel, Yusuke Oda, Matthew Richardson, **Naomi Saphra**, Swabha Swayamdipta, and Pengcheng Yin. Dynet: The dynamic neural network toolkit. *arXiv preprint arXiv:1701.03980*, 2017.

Awards

- 2022 **Outstanding Reviewer**, *ICLR*.
- 2021 **Outstanding Reviewer**, *ICLR*.
- 2019 **Best Poster Runner Up**, *NY Academy of Sciences - Natural Language, Dialogue & Speech*.
- 2019 **Daniella Sciamia Award for Achievement through Adversity**, *University of Edinburgh*.
- 2017 **Google Europe Scholarship for Students with Disabilities**.
- 2013 **Dragon Award**, *Carnegie Mellon School of Computer Science*.
- 2009 **National Merit Semifinalist**.
- 2009 **Nannina Rasulo Memorial Scholarship Award for Technology**, *Irvington High School*.

Teaching

- 2021 **Center for Data Science Capstone**, *NYU*.
Project Mentor
Proposed and supervised a small student project for a project-based class.
- 2019 **Probabilistic Modeling & Reasoning**, *University of Edinburgh*.
Tutor (Teaching recitations)
Reviewed mathematical problem sets in 2 sections of 5-25 students.
- 2017–2019 **Machine Learning & Pattern Recognition**, *University of Edinburgh*.
Tutor (Teaching recitations)
Reviewed mathematical problem sets in 6 sections total of 5-25 students.
- 2016 **Informatics Research Review**, *University of Edinburgh*.
Tutor (Teaching recitations)
Taught research survey skills in 2 sections of 5-25 students.
- 2013 **Natural Language Processing**, *Johns Hopkins University*.
Course Assistant (Grading)
- 2008–2009 **Ancient Greek**, *Irvington High School*.
Teacher's Assistant (Grading)

Supervision

- 2021 **University of Amsterdam MSc.**, Sylke Gosen.
Understanding Language Models through Perturbed Datasets.
Co-advised with Dieuwke Hupkes and Jaap Jumelet.
- 2018 **University of Edinburgh MSc.**, Alp Ozkan.
Combined Application of Pruning and Growing Approaches for Neural Networks.

2018 **University of Edinburgh MSc.**, Yekun Chai.
Discovering Spelling Variants on Urban Dictionary.

Talks

Invited event talks

- June 2022 **3rd Neural Scaling Laws Workshop**, Manoir Saint-Sauveur, Quebec.
Sources of Variance in Pretraining and Finetuning (Keynote)
- Nov 2020 **QueerInAI EMNLP Social**, Seattle, WA (Remote).
Transparent, Hackable, Accessible
- June 2020 **Pydatafest Amsterdam**, Amsterdam, Netherlands (Remote).
Accessible Means Hackable (Keynote)
- Aug 2019 **ACL Blackbox NLP Workshop**, Florence, Italy.
Blackbox NLP Panel Discussion
- Jan 2019 **Understanding & Analyzing Neural Networks Workshop**, Amsterdam, Netherlands.
Understanding Learning Dynamics Of Language Models with SVCCA

Other invited talks

- Jan 2023 **University of Copenhagen**, Copenhagen, Denmark (Remote).
University of Copenhagen NLP Seminar Series
- Oct 2022 **Formal Languages and Neural Networks (FLaNN)**, Remote.
- July 2022 **Oracle**, Boston, MA (Remote).
- June 2022 **Stanford University**, Palo Alto, CA (Remote).
Stanford NLP Seminar
- June 2022 **UC Irvine**, Irvine, CA.
- June 2022 **University of Southern California - Information Sciences Institute**, Irvine, CA.
- March 2022 **Formal Languages and Neural Networks (FLaNN)**, Remote.
- Feb 2022 **University College London**, London, UK.
- Nov 2020 **UC Berkeley**, Berkeley, CA (Remote).
Berkeley NLP Seminar
- Oct 2020 **NLP With Friends**, Remote.
- June 2020 **New York University**, New York, NY (Remote).
- May 2020 **Brown University**, Providence, RI (Remote).
Brown NLP Seminar
- Sept 2019 **Element AI**, London, UK.
- Aug 2019 **Allen Institute for AI**, Seattle, WA.
- May 2019 **City University of New York**, New York, NY.
- Jan 2019 **University of Amsterdam**, Amsterdam, Netherlands.
Netherlands-wide interpretability workshop

Outreach

- Jan 2022 **NYU AI School**, New York, NY (Remote).
Mathematical Fundamentals of AI
- March 2020 **!!Con West**, Santa Cruz, CA.
Get Hooked on Pytorch Hooks!
- Sept 2019 **Challenging the Work Society**, London, UK.
Carbon AI and the Concentration of Computational Work (jointly presented with Kate McCurdy)

- Feb 2019 **The Stand Edinburgh Comedy Club** , Edinburgh, UK.
Paying the Panopticon (standup comedy)
- Oct 2012 **Carnegie Mellon TechNights**, Pittsburgh, PA.
ML and NLP Guest Lectures (program for middle school girls)

Service

International

- 2022 **Co-organizer**, *Analyzing and interpreting neural networks for NLP (BlackboxNLP)* at *EMNLP*, Abu Dhabi, United Arab Emirates.
- 2022 **Session Chair (Interpretability)**, *ACL*, Dublin, Ireland.
- 2021 **Co-organizer**, *6th Workshop on Representation Learning for NLP (RepL4NLP)* at *ACL*, Remote.
- 2014 **Student social co-chair**, *ACL*, Baltimore, MD.

Diversity, Equity, & Inclusion

- 2020 **Panelist - D&I Session: Inclusivity in Conferences**, *NAACL*, Remote.
- 2020 **Accessibility Subcommittee**, *Association for Computational Linguistics (ACL)*, Remote.
- 2019–2020 **Disability representative**, *University of Edinburgh Staff Pride Network*, Edinburgh, UK.

Local service and outreach

- 2019–2020 **Radical Utopian Sci-Fi Enclave (RUSE)**, *University of Edinburgh*.
Co-organized monthly department sci-fi book club.
- 2017–2019 **ILCC Cookie Czar**, *University of Edinburgh*.
Organized weekly department social event.
- 2018–2019 **Edinburgh ML4NLP Reading Group**, *University of Edinburgh*.
Organized and led weekly reading group.
- 2012–2014 **North American Computational Linguistics Olympiad**, *Johns Hopkins University and Carnegie Mellon University*.
Tested puzzles and organized local high school competition.

Refereeing

Area Chair

- 2021–Present **Empirical Methods in Natural Language Processing (EMNLP)**, 2021, 2022.
- 2022 **Asian Association for Computational Linguistics (AACL)**, 2022.

Conference Reviewing

- 2021–Present **International Conference on Learning Representations (ICLR)**, 2021, 2022, 2023.
- 2017–Present **Neural Information Processing Systems (NeurIPS)**, 2017 (secondary), 2021, 2022.
- 2021–Present **European Association for Computational Linguistics (EACL)**, 2021, 2023.
- 2021–Present **Association for Computational Linguistics (ACL) Rolling Review**.
- 2019–2021 **Association for Computational Linguistics (ACL)**, 2019, 2020, 2021.
- 2019–2021 **North American Association for Computational Linguistics (NAACL)**, 2019, 2021.
- 2020 **International Conference on Machine Learning (ICML)**.
- 2017–2020 **Empirical Methods in Natural Language Processing (EMNLP)**, 2017, 2018, 2019, 2020.

Journal Reviewing

- 2022–Present **Computational Linguistics**.

Workshop and Competition Reviewing

- 2022 **Inverse Scaling Prize**.
- 2021 **I Can't Believe It's Not Better (NeurIPS Negative Results Workshop)**, *NeurIPS*.

- 2019–2021 **Analyzing and interpreting neural networks for NLP (BlackboxNLP)**, *ACL*, 2019, 2021.
2020 **The SIGNLL Conference on Computational Natural Language Learning (CoNLL)**, *ACL*.
2018–2020 **Widening NLP (WiNLP)**, *ACL*, 2018, 2019, 2020.
2017–2019 **Learning With Limited Data Workshop (LLD)**, *ICLR*, 2017, 2019.
2017 **Women in Machine Learning**, *NeurIPS*.
2017 **Representation Evaluation for NLP (RepL4NLP)**, *ACL*.