Michael Hanna

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1 Education:

University of Amsterdam, Amsterdam, The Netherlands
PhD, Computational Linguistics (begun Sept. 2022; expected ~Sept. 2026)

Erasmus Mundus Language and Communication Technologies (LCT) dual-degree master's program[1]
Charles University, Prague, Czech Republic (Sept. 2022)
MS, Computer Science; specialization in computational linguistics, GPA: 1 (excellent) / A; with honors
University of Trento, Trento, Italy (July 2022)
MS, Cognitive Science; specialization in computational linguistics, GPA: 110/110; with honors
Thesis: *Investigating Large Language Models' Representations Of Plurality Through Probing Interventions*

University of Chicago, Chicago, IL, USA (June 2020)
BS with Honors, Computer Science, specialization in machine learning; GPA: 3.95
BA with Honors, Linguistics; GPA: 3.96
Honors Thesis: *Measuring the Interpretability of Latent-Space Representations of Sentences from Variational Autoencoders*.

2 Publications:

Michael Hanna, Roberto Zamparelli, David Mareček. 2022. The Functional Relevance of Probed Information: A Case Study. European Association for Computational Linguistics (*to appear*)

Michael Hanna*, Federico Pedeni*, Alessandro Suglia, Alberto Testoni, and Raffaella Bernardi. 2022. ACT-Thor: A Controlled Benchmark for Embodied Action Understanding in Simulated Environments. In *Proceedings of the 29th International Conference on Computational Linguistics*, pages 5597–5612, Gyeongju, Republic of Korea. International Committee on Computational Linguistics.

Michael Hanna and Ondřej Bojar. 2021. A Fine-Grained Analysis of BERTScore. In *Proceedings of the Sixth Conference on Machine Translation*. Punta Cana, Dominican Republic (Online). Association for Computational Linguistics

Michael Hanna and David Mareček. 2021. Analyzing BERT's Knowledge of Hypernymy via Prompting. In *Proceedings of the Fourth BlackboxNLP Workshop on Analyzing and Interpreting Neural Networks for NLP*. Punta Cana, Dominican Republic. Association for Computational Linguistics

3 Experience:

Research Resident, Redwood Research (Berkeley, CA) (Jan. 2023 – Feb. 2023)
- Learned mechanistic interpretability techniques as part of the REMIX program
- Used causal interventions to study low-level mechanisms underlying GPT-2's behavior on linguistic tasks.

[1]These degrees were part of the Erasmus Mundus LCT dual-degree master's program. The 2020-2021 academic year took place at Charles University, and the 2021-2022 academic year, at the University of Trento.

Intern, Charles University, Institute of Formal and Applied Linguistics (Mar. 2021 – Aug. 2021)
- Used prompting to probe BERT for knowledge of hypernyms of common words.
- Conducted empirical experiments comparing BERT's hypernym discovery performance to existing systems'.

Research Assistant, University of Chicago, Department of Linguistics (Jan. 2020 – Jun. 2020)
- Used unsupervised clustering to test if ELMo embeddings of polysemous words were embedded in distinct clusters in the embedding space; this could allow for unsupervised learning of word senses.
- Used zero-shot probing tasks to explore the relationship between BERT's (masked) language modeling abilities / pre-training and its high performance on down-stream tasks.

Software Engineering Intern, Orbital Insight (Boston, MA) (Summer 2019)
- As part of a transition between geodata providers, used Python / scikit-learn to detect inaccurate geo-datapoints from the new data provider. This reduced by 10x the median error for datapoints.
- Wrote monitors in Python that both tracked and plotted trends in data, and sent alerts when anomalies were detected. Wrote Dockerfiles for easy deployment to Kubernetes.

Board Member, Board Manager (2019), Splash! Chicago (Sept. 2016 – Jun. 2020)
- Led Splash! Chicago, a volunteer student group organizing large (100-student) educational events where high school students can learn from university students. Taught linguistics classes for Splash! Chicago.

Grader, University of Chicago, Department of Computer Science (Fall 2018 – Summer 2020)
- Graded student projects, provided feedback regarding errors and areas to improve. Courses graded include Intro to CS, Intro to Comp. Systems, Comp. Architecture, Time Series Analysis and Stochastic Processes.

Student Programmer, University of Chicago STEM Education (Feb. 2018 - June 2018)
- Developed projects in Scratch to teach students (grades K-8) math and CS fundamentals.

4 Skills:

- **Programming and Markup Languages**: Python, C, LaTeX, Elm, Scratch
- **Human Languages**: English (native), Spanish (fluent), Korean (conversational)
- **Machine Learning Frameworks**: PyTorch, Tensorflow 2.0, scikit-learn

5 Scholarships & Honors:

- **European Laboratory for Intelligent Systems (ELLIS) PhD**: a selective PhD meta-program supporting co-supervision and research visits throughout Europe
- **LCT Scholarship**: scholarship for funded master's study of computational linguistics (approx. €40,000 value)
- **Enrico Fermi Scholar:** top 5% of undergraduate major (computer science)
- **Georgiana Simpson Scholar:** top 5% of undergraduate major (linguistics)
- **Phi Beta Kappa**: academic achievement honors fraternity (top ~5% of overall undergraduate class)
- **Summa Cum Laude (Undergraduate)**