

# KANISHKA MISRA

*PhD candidate interested in Natural Language Understanding and Cognitive Science*

**Email:** [kmisra@purdue.edu](mailto:kmisra@purdue.edu) **Website:** <https://kanishka.website/>

**Last Updated:** February 15, 2022

## Education

---

### Purdue University, West Lafayette

Ph.D. in Natural Language Understanding, 2018–*present*

Close collaboration with Allyson Ettinger (UChicago Linguistics)

**Dissertation:** *On Semantic Cognition, Inductive Generalization, and Language Models*

**Advisor:** Julia Taylor Rayz

### Purdue University, West Lafayette

M.S. in Natural Language Understanding, 2020, **GPA:** 4.0

**Thesis:** *Exploring Lexical Sensitivities in Word Prediction Models: A case study on BERT* [[link](#)]

**Advisor:** Julia Taylor Rayz

**Note:** Work performed alongside requirements for Ph.D.

### Purdue University, West Lafayette

B.S. *with distinction*. Computer Information Technology, 2014–2018, **GPA:** 3.72

Minor in Statistics

## Fellowships and Assistantships

---

- |              |   |
|--------------|---|
| 2022–present | Purdue Graduate Student Mentoring Fellow. Selected to understand and improve the advising relationship between faculty and students at Purdue University. <b>Award:</b> \$5,000 in research and travel funds.   |
| 2021–present | Research Assistantship funded through NSF EAGER Grant number 2039605. <b>Title:</b> <i>AI-based Humor-integrated Social Engineering Training</i> . <b>Contribution:</b> Co-wrote the “Technical Contribution” section, and served as key personnel. <b>PI:</b> Julia Taylor Rayz, <b>Co-PI:</b> Ida B. Ngambeki |
| 2018–2019    | Purdue Research Foundation (PRF) Fellowship. <b>Title:</b> <i>Computational Analysis of Online Predatory Texts</i> . <b>Contribution:</b> Wrote the grant in its entirety. <b>Mentor:</b> Julia Taylor Rayz.  |

## Peer-reviewed Publications

---

- |      |  |
|------|--|
| 2022 | <b>Kanishka Misra</b> , Allyson Ettinger, Julia Taylor Rayz. A Property Induction Framework for Neural Language Models. ( <i>under review at CogSci 2022</i> )                       |
| 2022 | <b>Kanishka Misra</b> . On Semantic Cognition, Inductive Generalization, and Language Models. <i>AAAI 2022 Doctoral Consortium</i> , Vancouver, Canada. [ <a href="#">preprint</a> ] |

- 2021 **Kanishka Misra**, Allyson Ettinger, Julia Taylor Rayz. Do Language Models learn typicality judgments from text? *43rd Annual Conference of the Cognitive Science Society. (Oral Presentation; 14% acceptance rate)* [[preprint](#)]
- 2021 **Kanishka Misra**, Julia Taylor Rayz. Finding fuzziness in Neural Network models of Language Processing. *Annual Meeting of the North American Fuzzy Information Processing Society 2021. (Honorable Mention for Best Student Paper)*. [[preprint](#)]
- 2020 **Kanishka Misra**, Allyson Ettinger, Julia Taylor Rayz. Exploring BERT’s Sensitivity to Lexical Cues using Tests from Semantic Priming. *Findings of the Association for Computational Linguistics: EMNLP 2020*. [[link](#)]
- 2020 Qingyuan Hu, Yi Zhang, **Kanishka Misra**, Julia Taylor Rayz. Exploring Lexical Irregularities in Hypothesis-Only Models of Natural Language Inference. *2020 IEEE 19th International Conference on Cognitive Informatics & Cognitive Computing (ICCI\* CC)*. [[link](#)]
- 2020 **Kanishka Misra**, Julia Taylor Rayz. An Approximate Perspective on Word Prediction in Context: Ontological Semantics meets BERT. *Annual meeting of the North American Fuzzy Information Processing Society 2020* [[preprint](#)]
- 2019 **Kanishka Misra**, Hemanth Devarapalli, Tatiana Ringenberg, Julia Taylor Rayz. Authorship Analysis of Online Predatory Conversations using Character Level Convolution Neural Networks. *2019 IEEE International Conference on Systems, Man and Cybernetics (SMC)*., Bari, Italy. [[link](#)]
- 2019 Tatiana Ringenberg, **Kanishka Misra**, Julia Taylor Rayz. Not So Cute but Fuzzy: Estimating Risk of Sexual Predation in Online Conversations. *2019 IEEE International Conference on Systems, Man and Cybernetics (SMC)*., Bari, Italy. (**joint first author**) [[link](#)]
- 2019 Qiaofei Ye, **Kanishka Misra**, Hemanth Devarapalli, Julia Taylor Rayz. A Sentiment Based Non-Factoid Question-Answering Framework. *2019 IEEE International Conference on Systems, Man and Cybernetics (SMC)*., Bari, Italy. [[link](#)]
- 2019 **Kanishka Misra**, Hemanth Devarapalli, Julia Taylor Rayz. Measuring the Influence of L1 on Learner English Errors in Content Words within Word Embedding Models. *17th International Conference on Cognitive Modelling 2019.*, Montréal, Canada. [[link](#)]
- 2019 Tatiana Ringenberg, **Kanishka Misra**, Kathryn C. Seigfried-Spellar, Julia Taylor Rayz. Exploring Automatic Identification of Fantasy-Driven and Contact-Driven Sexual Solicitors. *2019 Third IEEE International Conference on Robotic Computing (IRC)*., Naples, Italy. [[link](#)]
- 2019 Kathryn C Seigfried-Spellar, Marcus K Rogers, Julia T Rayz, Shih-Feng Yang, **Kanishka Misra**, Tatiana Ringenberg. Chat analysis triage tool: Differentiating contact-driven vs. fantasy-driven child sex offenders. *Forensic Science International*, 2019. [[link](#)]

## Peer-reviewed Abstracts

---

- 2020 **Kanishka Misra**, Allyson Ettinger, Julia Taylor Rayz. Exploring BERT’s lexical relations using Semantic Priming. *CogSci 2020* [[poster](#)] [[link](#)]

- 2019 **Kanishka Misra**, Hemanth Devarapalli, Julia Taylor Rayz. L1 Influence on Content Word errors in Learner English Corpora: Insights from Distributed Representation of Words. *CogSci 2019*, Montréal, Canada. [[poster](#)] [[link](#)]

## Honors and Awards

---

- 2022 **Fellow**, *Purdue Graduate Student Mentoring Fellows Program*. **Amount:** \$5,000 in research funds.
- 2021 **Honorable Mention for Best Student Paper**, *North American Fuzzy Information Processing Society*. **Amount:** \$100.
- 2019 **Holistic Safety and Security Research Travel Grant**, *Purdue Polytechnic Institute*. **Amount:** \$500.
- 2019 **CIT Research Travel Grant Award**, *Purdue CIT*. **Amount:** \$1200 (CogSci 2019), \$600 (IEEE-SMC 2019).
- 2019 **Best HSS Poster Presentation**, *CERIAS Symposium*. Award presented by committee on Holistic Safety and Security (HSS) research impact area. [[link](#)].
- 2019 **Conference Travel Award**, *Chicago R Unconference*. **Amount:** \$150.
- 2018 **PRF Fellowship**, *Purdue Research Foundation*. Covered two semesters worth of graduate school, in addition to stipend.
- 2018 **Best Poster Award - PPI**, *Purdue Office of Undergraduate Research Expo*. **Amount:** \$250. [[link](#)]
- 2018 **Research Scholarship**, *Purdue Office of Undergraduate Research*. **Amount:** \$500.
- 2017 **First Place**. *Indy Civic Hackathon*. **Amount:** \$2000 split across 4 team members.

## Teaching

---

### Teaching Assistant - *Database Fundamentals* (CNIT 272)

**Timeline:** Fall 2019, Spring 2020, Fall 2020

**Course Professor:** Dr. Dawn D. Laux

Developed lecture videos and taught fundamentals of relational databases and SQL to three lab sections ( $\approx 70$  students on average across three semesters).

**Instructor Rating:** 4.8 (on average across three semesters)

### Guest Lecturer - *Natural Language Technologies* (CNIT 519)

**Timeline:** Fall 2019, Fall 2020, Spring 2022

**Course Professor:** Dr. Julia Taylor Rayz

- Two lectures on Neural Network models of Natural Language Processing
- Developing two assignments on neural networks and language models.

## Work Experience

---

Summer 2021	<b>NLP Engineering/Research Intern - <i>Pythonic AI</i></b> Integrating Medical Knowledge into Language Models. <b>Host:</b> Baoqiang Cao, CTO and Co-founder.
Spring 2018	<b>Undergraduate Research Assistant - <i>Purdue University</i></b> Using Machine Learning models to estimate levels of contact offence through online chat conversations. Funded by Office of Undergraduate Research, Purdue University. <b>Mentor:</b> Julia Taylor Rayz.
Summer 2017	<b>Data Scientist Intern - <i>Perscio</i>, Indianapolis, IN.</b> Data Analysis on Healthcare Data. Collaboration with SPEA (at Indiana University) to work on Opioid Prescription Trends in Indiana. <b>Mentor:</b> Kent Hiller, CTO.
Spring 2017	<b>Undergraduate Research Assistant - <i>Purdue University</i></b> Using Statistical models to understand and predict deviant behavior in the cyberspace. <b>Mentor:</b> Kathryn Seigfried-Spellar.

## Mentorship

---

<b>2018-19</b>	John Phan (Undergraduate). <b>Topic:</b> <i>Gender Bias in Word Embeddings</i> . Awarded NSF REU scholarship. <b>Outcome:</b> Two poster presentations.
<b>2020</b>	Qingyuan “Carol” Hu and Yi Zhang (Undergraduates). <b>Topic:</b> <i>Exploring Lexical Irregularities in Hypothesis-only Models of Natural Language Inference</i> . <b>Outcome:</b> Publication in <i>IEEE ICC* CI 2020</i> , and a presentation at <i>PURC 2020</i> , which was awarded <u>second place</u> across all students from the Purdue Polytechnic Institute.

## Reviewing

---

<b>Primary</b>	CogSci (2020, 2021, 2022); CoNLL 2021; ACL Rolling Review 2021
<b>Secondary</b>	EMNLP 2020; IJCAI 2020; *SEM 2019; IEEE-IRC 2019.
<b>Book</b>	Chapman & Hall/CRC Press Statistics Series (2020, 2021).

## Service

---

- **Local Arrangements Chair**, *Annual Meeting of the North American Fuzzy Information Processing Society 2021 (NAFIPS 2021)* held at Purdue University.
- **Volunteer**, *36th AAAI Conference on Artificial Intelligence*.
- **Program Committee:** CoNLL 2021
- **Graduate Student Advisor**, *Purdue CIT Student Council*.

- **Lab Management:** AKRaNLU lab, Purdue CIT.
- **Organizer,** Undergraduate Research Panel, Purdue CIT.

## Skills

---

<b>Programming</b>	R (expert), Python (expert), SQL (proficient), L <sup>A</sup> T <sub>E</sub> X
<b>Libraries</b>	pytorch, tidyverse(R), tidymodels(R), tensorflow, Rcpp, gensim
<b>Statistics</b>	Probability Theory, GLMs, LMEMs, Bayesian Models
<b>Natural Languages</b>	English, Hindi, Gujarati, Odiya

## Software Developed

---

**minicons** A toolkit to facilitate behavioral and representational analyses of transformer-based language processing models. [[github](#)]

## Professional Affiliations

---

- Association of Computational Linguistics (ACL)
- Cognitive Science Society (CogSci)
- Institute of Electrical and Electronic Engineers (IEEE)
- Center for Education and Research in Information Assurance and Security (CERIAS)
- Society for Mathematical Psychology (MathPsych)

## References

---

**NLP Research:** Dr. Julia Taylor Rayz, Dr. Allyson Ettinger, Dr. Victor Raskin

**Teaching:** Dr. Dawn Laux

**Industry:** Dr. Baoqiang Cao, Matt Younkle, Kent Hiller, Bob Boehnlein