Kanishka Misra

PhD Student in Natural Language Understanding

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Education

2018–present **Ph.D.**, *Purdue University*, West Lafayette, IN.
Natural Language Understanding
Applied Knowledge Representation and Natural Language Understanding (*AKRaNLU*) lab
Close collaboration with Allyson Ettinger
Advisor: **Julia Taylor Rayz**

2018–2020 **M.S.**, *Purdue University*, West Lafayette, IN.
Natural Language Understanding
Thesis: *Exploring Lexical Sensitivities in Word Prediction Models: A Case Study on BERT*
Advisor: Julia Taylor Rayz
Committee Members: Victor Raskin, John Springer

2014–2018 **B.S. *with distinction***, *Purdue University*, West Lafayette, IN.
Computer Information Technology
Minor: Statistics

Fellowships and Assistantships

August 2018 - May 2019 **Ph.D. Research Fellowship**, *Purdue Research Foundation*.

- One year Research fellowship awarded to work on predatory conversational environments.
- Developing supervised and unsupervised methods to analyze language used by Contact and Non Contact offenders.
- 3 publications in IEEE based conferences
  1 Poster at CERIAS Symposium **(Best Poster Award for Holistic Safety and Security Research)**

Teaching

Aug 2019 – Present **CNIT 272 - Database Fundamentals**, *Purdue University*, West Lafayette, IN.
Department of Computer Information Technology, Supervised by Dr. Dawn Laux.

- **Fall 2020:** 1/4 Lab Section (25 students) and an Online Section (30 students). Also in charge of preparing instructional material for labs.
- **Spring 2020:** 3/6 Lab Sections (71 students), Ratings not calculated due to COVID-19.
- **Fall 2019:** 3/5 Lab Sections (73 students), Average Rating (out of 5): 4.83 (4.9/4.7/4.9).

Publications

2020 **Kanishka Misra**, Allyson Ettinger, Julia Taylor Rayz. Exploring BERT's Sensitivity to Lexical Cues using Tests from Semantic Priming. *Findings of EMNLP 2020* (Forthcoming)

2020 Qingyuan Hu, Yi Zhang, **Kanishka Misra**, Julia Taylor Rayz. Exploring Lexical Irregularities in Hypothesis-OnlyModels of Natural Language Inference. *2020 IEEE 19th International Conference on Cognitive Informatics & Cognitive Computing (ICCI* CC)*

2020 **Kanishka Misra**, Julia Taylor Rayz. An Approximate Perspective on Word Prediction in Context: Ontological Semantics meets BERT. *NAFIPS 2020* (Forthcoming)

2019 **Kanishka Misra**, Hemanth Devarapalli, Tatiana Ringenberg, Julia Taylor Rayz. Authorship Analysis of Online Predatory Conversations using Character Level Convolution Neural Networks. *IEEE-SMC 2019.*, Bari, Italy

2019 Tatiana Ringenberg, **Kanishka Misra**, Julia Taylor Rayz. Not So Cute but Fuzzy: Estimating Risk of Sexual Predation in Online Conversations. *IEEE-SMC 2019.*, Bari, Italy **(Joint first author)**

2019 **Kanishka Misra**, Hemanth Devarapalli, Julia Taylor Rayz. Measuring the Influence of L1 on Learner English Errors in Content Words within Word Embedding Models. *ICCM 2019*, Montréal, Canada

2019 Tatiana Ringenberg, **Kanishka Misra**, Kathryn C. Seigfried-Spellar, and Julia Taylor Rayz. Exploring Automatic Identification of Fantasy-Driven and Contact-Driven Sexual Solicitors. *2019 Third IEEE International Conference on Robotic Computing (IRC)*

2019 Kathryn C Seigfried-Spellar, Marcus K Rogers, Julia T Rayz, Shih-Feng Yang, **Kanishka Misra**, and Tatiana Ringenberg. Chat analysis triage tool: Differentiating contact-driven vs. fantasy-driven child sex offenders. *Forensic science international, 2019*

Poster Presentations

July 2020 **Kanishka Misra**, Allyson Ettinger, Julia Taylor Rayz. Exploring BERT's lexical relations using Semantic Priming. *CogSci 2020* (Forthcoming)

July 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

April 2019 **Kanishka Misra**, Hemanth Devarapalli, Julia Taylor Rayz. Authorship Attribution of Predators in Chat Conversations. *CERIAS Symposium 2019* **(Best Poster Award, HSS)**

April 2019 John Phan, **Kanishka Misra**, Julia Taylor Rayz. Towards Trustworthy NLP Systems: Detecting Bias in Popular Models. *CERIAS Symposium 2019*

April 2019 John Phan, **Kanishka Misra**, Julia Taylor Rayz. Understanding Existing Bias in the Unsaid: Lessons Learnt from Word Embeddings. *PURC 2019*

April 2018 **Kanishka Misra**, Julia Taylor Rayz. Predicting Future Interaction Between Predators and Decoys in an Online Conversational Environment. *PURC 2018* **(Best Poster Award)**

Work Experience

May 2017 – Aug 2017 **Data Scientist Intern**, *Perscio*, Indianapolis, IN.

- Tidied, transformed, visualized and modelled healthcare data to help clients make effective data driven decisions.
- Built quick data driven reports and tools using Tableau and Shiny (effective web based presentation of data, in R).
- Collaborated with the state of Indiana and SPEA(at IU) to work on opioid prescription trends in the state.
- **Skills utilized:** R (tidyverse), Tableau, Shiny.

Jan 2017 – April 2017 **Undergraduate Research Assistant**, *Purdue University*, West Lafayette, IN.

- Performed Statistical data analysis and modeling on a cyber crime dataset to understand and predict deviant behavior in the cyberspace.
- **Skills utilized:** R, SPSS.

Talks

March 2019 **K. Misra** - footrulr: An R Package for measuring the performance of Machine Generated Text. Chicago R Unconference, 2019

October 2019 **K. Misra** - 2 Lectures, Modern NLP: From word vectors to sequence models to BERT. Natural Language Processing class (CNIT 581) taught by Dr. Julia Rayz

Awards

September 2019 **Holistic Safety and Security Research Travel Grant**, *Purdue Polytechnic Institute*.
Awarded $500 to present published research results at IEEE-SMC 2019

May, September 2019 **CIT Research Travel Grant Award**, *Purdue CIT*.
Awarded $1200 to travel to CogSci 2019 ($600) and IEEE-SMC 2019 ($600) and present published research results

April 2019 **Best Student Presentation**, *CERIAS Symposium*.
Award Presented in Association with the Holistic Safety and Security Research Impact area

March 2019 **Conference Travel Award**, *Chicago R Unconference*.
Travel and Lodging Grant ($150)

April 2018 **Best Undergraduate Research Poster**, *Purdue OUR Expo*.
Award presented as a result of a successful presentation of my research poster titled *Predicting future interaction between predators and decoys in an online conversational environment*

January 2018 **Research Scholarship**, *Office of Undergraduate Research, Purdue University*.
Semester long scholarship to work on predatory content in conversational environments

June 2017 **First Place**, *Indy Civic Hackathon*.
Open Innovation Challenge - Awarded for developing an exploratory tool to map Health Concerns in various counties of Indiana with the respective budget allocations

Skills

Programming R (Expert), Python (Expert), SQL (Proficient), C++ (Beginner, mostly Rcpp), LaTeX(Beginner)

Libraries pytorch, tidyverse(R), tidymodels(R), tensorflow, Rcpp, gensim

Statistics Probability Theory, GLMs, Statistical Inference, Bayesian Models (Beginner)

Natural Languages: English, Hindi, Gujarati, Odiya

Graduate Coursework

- Natural Language Understanding
- NLP in Information Security
- Probability Theory
- Deep Learning
- Deep Learning in Cybersecurity
- Design of Experiments
- Linguistics Semantics
- Philosophy of Applied Science
- Semantics of Humor
- Statistical Inference

Mentoring

2018-2019 John Phan (Undergraduate) Gender Bias in Word Embeddings

2019 Addison Farinas (Undergraduate) Analysis and Annotation of Humorous News Headlines

2020 Qingyuan "Carol" Hu and Yi Zhang (Undergraduates) Exploring Lexical Irregularities in Hypothesis-only Models of Natural Language Inference **Awarded second place at PURC 2020**

Service

2020 EMNLP emergency reviewer

2020 CogSci 2020 reviewer

2020 CRC Press Book reviewer

2020 IJCAI reviewer

2018 IEEE-IRC reviewer

2019 *SEM (Secondary reviewer)

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

Academia

- Dr. Julia Rayz
- Dr. Dawn D. Laux
- Dr. Allyson Ettinger
- Dr. Victor Raskin

Industry

- Kent Hiller
- Bob Boehnlein

(more upon request)