

ADAKU UCHENDU

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EDUCATION

Pennsylvania State University

Ph.D. in Information Sciences and Technology

Thesis: *Reverse Turing Test in the Age of Deepfake Texts*

Advisor: Dr. Dongwon Lee

University Park, Pennsylvania

August 2018 - August 2023

University of Maryland Baltimore County

B.S. Mathematics | Minor: Statistics, **Honors:** Cum Laude

Thesis: *Numerical Simulation of Vibrations of Mechanical Structures*

Advisor: Dr. Bedrich Sousedik

Baltimore, Maryland

August 2014 - May 2018

RESEARCH INTERESTS

NLP, NLG, LLMs, Cybersecurity, Adversarial Robustness, Machine Learning, Topological Data Analysis

ACADEMIC ACHIEVEMENTS AND AWARDS

Alfred P. Sloan Minority Ph.D. Scholarship (**\$40,000**)

NSF SFS Scholarship (**\$34,000 annually**)

Bunton-Waller Graduate Fellowship

January 2021 - August 2023

August 2020 - May 2023

August 2018 - May 2023

Diversity & Inclusion ICML 2022 & BlackinAI conference scholarship

Diversity & Inclusion ACL 2022 conference Student Scholarship

WiCyS Student Scholarship

CRA-WP Grad Cohort for Women

ACM Richard Tapia Conference Student Scholarship

CRA-WP URMD/IDEALS Student Scholarship

TTO Student Travel Scholarship (**£1250**)

Best Poster Presentation at ATRC internship

Best Documentation at ATRC internship

Outstanding Tutor Award

Pi Mu Epsilon Mathematics Honors Society

Undergraduate Research Award Scholar (**\$1500**)

McNair Scholar

July 2022

May 2022

September 2021, March 2022

April 2021, 2022

September 2020, 2021, 2022

March 2020, 2022

October 2019

August 2019

August 2019

May 2018

May 2017 - May 2018

March 2017 - May 2018

January 2016 - May 2018

PUBLICATIONS

* means equal contribution

- [arXiv'23] Adaku Uchendu, Thai Le, Dongwon Lee, "[TopRoBERTa: Topology-Aware Authorship Attribution of Deepfake Text](#)," arXiv preprint, September 2023
- [HCOMP'23] Adaku Uchendu*, Jooyoung Lee*, Hua Shen*, Thai Le, Kenneth Huang, Dongwon Lee, "[Does Human Collaboration Enhance the Accuracy of Identifying Deepfake Texts?](#)," *11th AAAI Conference on Human Computation and Crowdsourcing (HCOMP)*, Delft, Netherlands, November 2023
- [Web Conf'23] Fionda, V., et al., "[Tutorials at The Web Conference 2023](#)," In Companion Proceedings of the *ACM Web Conference 2023* (pp. 648-658), Austin, Texas, April 2023

6. [KDD Exp'23] Adaku Uchendu, Thai Le, Dongwon Lee, "[Attribution and Obfuscation of Neural Text Authorship: A Data Mining Perspective](#)," *ACM SIGKDD Explorations Newsletter*, Vol. 25(1), June 2023
5. [AIKE'21] Adaku Uchendu, Daniel Campoy, Christopher Menart, Alexandra Hildenbrandt. "[Robustness of Bayesian Neural Networks to White-Box Adversarial Attacks](#)," *IEEE Fourth International Conference on Artificial Intelligence and Knowledge Engineering (AIKE)*. IEEE, 2021.
4. [EMNLP'21] Adaku Uchendu, Zeyu Ma, Thai Le, Rui Zhang, Dongwon Lee. "[TURINGBENCH: A Benchmark Environment for Turing Test in the Age of Neural Text Generation](#)," *Findings of the Association for Computational Linguistics: EMNLP 2021* (pp. 2001-2016), Punta Cana, Dominican Republic, November 2021
3. [EMNLP'20] Adaku Uchendu, Thai Le, Kai Shu, Dongwon Lee. "[Authorship Attribution for Neural Text Generation](#)," *In Proceedings of the 2020 Conference on Empirical Methods in Natural Language Processing (EMNLP)*, Virtual Event, November 2020
2. [TTO'19] Adaku Uchendu, Jeffrey Cao, Qiaozhi Wang, Bo Luo, Dongwon Lee. "[Characterizing Man-made vs. Machine-made Chatbot Dialogs](#)," *In Conference on Truth and Trust Online (TTO)*, London, UK, October 2019
1. [WebSci'19] Jialin Shao, Adaku Uchendu, Dongwon Lee. (2019). "[A Reverse Turing Test for Detecting Machine-Made Texts](#)," *In 11th International ACM Web Science Conference (WebSci)*, Boston, MA, July 2019

TUTORIALS

3. [NSF Summit'23] Adaku Uchendu, Thai Le, Dongwon Lee, "[Catch Me If You GPT: Tutorial on Deepfake Texts](#)," *2023 NSF Cybersecurity Summit for Large Facilities and Cyberinfrastructure at Lawrence Berkeley National Laboratory*, Berkley, California, October 2023 (*Training/Workshop*)
2. [Web Conf'23] Adaku Uchendu, Thai Le, Dongwon Lee, "[Catch Me If You GAN: Generation, Detection, and Obfuscation of Deepfake Texts](#)," *ACM Web Conference (WWW)*, Austin, Texas, April 2023
1. [INLG'22] Adaku Uchendu, Vladislav Mikhailov, Jooyoung Lee, Saranya Venkatraman, Tatiana Shavrina, Ekaterina Artemova. "[Tutorial on Artificial Text Detection](#)," *The 15th International Conference on Natural Language Generation (INLG): Tutorial*, Maine, July 2022

THESES

2. Adaku Uchendu. (2023). [Reverse Turing Test in the Age of Deepfake Texts](#). Ph.D. Dissertation, College of Information Sciences and Technology, Pennsylvania State University, PA, USA. 2023.
1. Adaku Uchendu. (2017). [Numerical Simulation of Vibrations of Mechanical Structures](#). Senior Thesis, Department of Mathematics and Statistics, University of Maryland Baltimore County (UMBC), MD, USA. 2018. [[slides](#)]

INVITED TALKS

- *Detection and Obfuscation of Deepfake Texts*, at MIT Lincoln Laboratory's fourth Recent Advances in Artificial Intelligence for National Security (RAAINS) workshop, **Student Lightning talk**, Boston, MA, November 16, 2022.
- *Attribution and Obfuscation of Neural Text Authorship*, at Dublin City University, Ireland, **NLP Seminar**, Virtual, October 10, 2022

- *Reverse Turing Test in the Age of Neural Text Generation*, at National Institute of Standards and Technology (NIST), Information Technology Laboratory, **Software and Systems Division**, Virtual, February 10, 2022.
- *Reverse Turing Tests for Distinguishing AI-generated texts from Human-written texts*, at National Institute of Standards and Technology (NIST), **Applied and Computational Mathematics Division (ACMD)** Seminar Series, Virtual, May 25, 2021.

PRESENTATIONS

- *TuringBench*, at Pan-APA 5th Annual Conference at The Pennsylvania State University, April 9, 2022.

RESEARCH EXPERIENCE

PIKE Research Lab @ Penn State — <i>Research Assistant</i>	University Park, Pennsylvania
<ul style="list-style-type: none"> • Research project: Reverse Turing Tests • Description: Built automatic and human-based approaches to accurately distinguish deepfake (LLM-generated) texts from human-written ones. Deepfake text generators include GPT-3, PPLM, LLaMA, Flan-T5, etc.. • Advisor: Dr. Dongwon Lee 	<i>August 2018 - August 2023</i>
Pacific Northwest National Lab — <i>NSIP Ph.D. Intern</i>	Richland, Washington (Virtual)
<ul style="list-style-type: none"> • Research project: Analysis of Cybersecurity contract documents • Description: Used NLP techniques to assess the coverage of cybersecurity contract-like vocabulary in the documents. • Mentor: Dr. David McKinnon 	<i>May 2022 - August 2022</i>
IBM Research — <i>Ph.D. Research Intern</i>	San Jose, California (Virtual)
<ul style="list-style-type: none"> • Research project: AutoML for NLP • Description: Worked on an Automated AI model for text classification. • Mentors: Dr. Sairam Gurajada & Dr. Alexandre Evfimievski 	<i>May 2021 - August 2021</i>
ATRC, Air Force Research Laboratory — <i>Research Assistant Intern</i>	Dayton, Ohio (Virtual)
<ul style="list-style-type: none"> • Research project: Adversarial Robustness of Bayesian Neural Networks • Description: Implemented an adversarially robust Deep learning model by incorporating Bayesian Inference. • Mentors: Christopher Menart & Alexandra Hildenbrandt 	<i>May 2020 - October 2020</i>
ATRC, Air Force Research Laboratory — <i>Research Assistant Intern</i>	Dayton, Ohio
<ul style="list-style-type: none"> • Research project: Reproducibility of the One-Pixel Attack • Description: Studied the characteristics of the one-pixel adversarial attack and its robustness. • Mentor: Alexandra Hildenbrandt 	<i>May 2019 - August 2019</i>
Federal Reserve Board — <i>IT intern</i>	Washington, D.C.
<ul style="list-style-type: none"> • Research project: Islamic vs. Non-Islamic banks • Description: Investigated the Financial inclusion and growth of Islamic vs. Non-Islamic banks. • Mentor: Dr. Nida Davis 	<i>May 2017 - August 2018</i>
University of Maryland Baltimore County — <i>Research Assistant</i>	Baltimore, Maryland
<ul style="list-style-type: none"> • Research project: Numerical Simulation of Mechanical Structures 	<i>February 2016 - May 2018</i>

- **Description:** Researched the appropriate damping constant needed to reduce the oscillation of a simulated mechanical structure in MATLAB.
- Mentor: Dr. Bedrich Sousedik

TEACHING EXPERIENCES

Pennsylvania State University Teaching Assistant

State College, Pennsylvania
January 2019 - May 2019

- Worked as a Teaching Assistant in a Security and Risk Analysis course.
- Assisted students with the use of Excel and R, graded and held office hours.

REU Lab Tutor

May & June 2021

- Designed and instructed the lab on LaTeX, Overleaf, and AI text-generation

University of Maryland Baltimore County Math Lab Tutor

Baltimore, Maryland
September 2015 - May 2018

- Tutored the following courses: College Algebra, Pre-calculus, Calculus I, Calculus II, Calculus III, Linear Algebra, and Differential Equations.

Math Learning Assistant (LA)

August 2016 - December 2016

- Assisted students in Pre-Calculus.
- Held weekly discussion sessions and Office hours.
- Presented the students with a weekly individual quiz and graded it.

PROFESSIONAL & ACADEMIC SERVICES

- Graduate Student Association in IST, Penn State (Treasurer)
- Penn State Pan-African Professional Alliance (IT Officer)
- Planning Committee of the 2023 6th Annual Pan-APA conference @ Penn State
- **Journal Reviewer**
Social Network Analysis and Mining (SNAM), Language Resources and Evaluation (LREV), Journal of Artificial Intelligence (AIJ)
- **Program committee**
The First Workshop on Efficient Benchmarking in NLP (NLP Power) at ACL 2022

MENTORING EXPERIENCE

- UMBC Reach Initiative (September 2017 - May 2018)
 - Provided STEM exposure and professional development for Baltimore high school girls
- UMBC Summer 2021 McNair students (through *2021 McNair Alumni Mentor*)
- Jason Lucas (junior Ph.D. student @ PIKE lab) on *general research*

PRESS COVERAGE

- “[Is AI the Future of Content Generation?](#),” **Bloggers Insights**, August 2021.
- “[Five top technology trends from 2021 that are here to stay](#),” **Ericsson Blog**, June 2021.
- “[Finance’s Embrace Of AI-Generated Writing](#),” **Robot Writers AI**, March 2021.
- “[Researchers test detection methods for AI-generated content](#),” **Penn State News**, February 2021.
- “[Siblings pursue parallel doctoral degrees](#),” **Penn State News**, August 2020.
- “[Adaku Uchendu to extend passion for mathematics through information sciences Ph.D. at Penn State](#),” **UMBC News**, April 2018.

SKILLS

Programming: Python, R, Matlab, Java, L^AT_EX, Maple

Tools: PyTorch, Tensorflow, Keras, Transformers

Applications: Git, Tableau, R Shiny

Operating Systems: Linux, Windows, MacOS

REFERENCE LIST

Dongwon Lee (Pennsylvania State University)

David McKinnon (Pacific Northwest National Lab)

Rui Zhang (Pennsylvania State University)

Thai Le (University of Mississippi)