

WOOJOO NA

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EDUCATION

Tufts University Sep. 2021 - Dec. 2023

MS in Computer Science | GPA : 3.96 / 4.0

· Master's Thesis Advisor : Abiy Tasissa

· Master's Thesis : Novel Ensemble learning method with applications in Weakly Supervised Learning

[2019-2021] : Mandatory military service in the Republic of Korea Army

University of Oxford Oct. 2016 - July 2019

B.A. (Hons) in Mathematics | GPA : 3.5 / 4.0 (Approx. equivalent)

RESEARCH EXPERIENCE

Data Intensive Studies Center, Tufts University Sep. 2021 - Present

Graduate Researcher, Advisor : Professor Abiy Tasissa

- Developed a novel algorithm, RACH-Space which labels data when given partial, noisy information about their label. Shows state-of-the-art performance compared to other existing models in weakly supervised learning

- Submitted to ICML 2024. <https://arxiv.org/abs/2307.04870>

University of Oxford, Mathematical Institute July 2019 - Dec. 2019

Undergraduate Researcher, Advisor : Professor Christophe Petit

- Developed a novel trapdoor attack against parameters suggested at NutMiC2019 conference on Cayley hash functions, using group theoretical approach

- Presented at the 17th IMA International Conference on Cryptography and Coding <https://malb.io/imacc2019/>

University of Oxford, Department of Computer Science July 2019 - Dec. 2019

Undergraduate Researcher, Advisor : Professor Thomas Lukasiewicz

- Worked on similarities between word embeddings of transformer encoder and the conceptual space.

- Visualized the word embedding to help infer how convex manifolds in conceptual space imply same word category

- Results providing intuition behind the fact that words that belong to the same category share low dimensional features, similar to how words are perceived in the human brain

University of Oxford, Mathematical Institute June 2018 - Oct. 2018

Undergraduate Researcher, Advisor : Dr. Andrey Kormilitzin

- Competed in the n2c2 challenge on Adverse Drug Events and Medication Extraction in EHRs

- Exploited CNN architecture and a character level word embedding model to demonstrate a robust approach to concept extraction and relation extraction.

University of Oxford, Department of Computer Science June 2018 - Oct. 2018

Undergraduate Researcher, Advisor : Professor Thomas Lukasiewicz

- Worked on knowledge graph completion for ontology reasoning

PUBLICATIONS

“RACH-Space: Reconstructing Adaptive Convex Hull Space with Applications in Weak Supervision”, Woojoo Na, Abiy Tasissa

- <https://arxiv.org/abs/2307.04870> (Submitted to ICML 2024)

- Sole first author of the state-of-the-art machine learning algorithm for weakly supervised learning.

TALKS & PRESENTATIONS

“Novel Ensemble learning method with applications in Weakly Supervised Learning” December, 2023

Master's Thesis Defense, Tufts University

“Comparing One-Way and Two-Way eHMI Systems: The Impact on Trust in Human-Robot Interaction for Autonomous Vehicles” May, 2023

Presentation, Tufts University

- “P2-equivariant Convolutional Networks on MNIST dataset”** May, 2022
Presentation, Tufts University
- “Bounding worst case errors of Weak Supervision Algorithms”** April, 2022
Tufts University Mathematics Graduate Seminar
- “Fake news detection and its impact on financial markets”** November, 2021
Best Prize, Poster session at 2021 Republic of Korean Army Start-up competition
- “Security of Cayley hash functions”** January, 2020
Invited speaker at Ewha Womens University, Cryptography and Mathematics Seminar
- “Trapdoor attack on Cayley hash function parameters proposed at NutMic 2019 conference.”** December, 2019
17th IMA International Conference on Cryptography and Coding <https://malb.io/imacc2019/>
- “A deep learning approach to concepts extraction from medical texts.”** October, 2018
Poster session at the University of Oxford, Mathematical Institute

AWARD & SCHOLARSHIPS

- '22-'23 Tuft University Linda M. Abriola Graduate Fellowship (\$ 5,000, awarded to 2 best graduate students)
- '21-'22 Tuft University Linda M. Abriola Graduate Fellowship (\$ 5,000, awarded to 2 best graduate students)
- Lady Margaret Hall Academic Development Fund for Undergraduate research, 2018 (£500)

TEACHING EXPERIENCE

Tufts University, Department of Computer Science Jan. 2023 - May. 2023
Teaching Assistant, CS170 Computation Theory

WORK EXPERIENCE

- Republic of Korea Army, 2nd Artillery Brigade (Hwacheon, Korea)** Feb. 2020 - Aug. 2021
Sergeant, Fire Direction Operator
- Computed ballistics calculations regarding angle and power of cannon fires and relayed the resultant commands to 6 K9 tanks
 - Awarded three awards from the brigadier general of my brigade for excellence, selected / trained to participate in the 21-1 CCPT(Combined Command Post Training) to facilitate work between the US Army and Korean Army
- Utpal Shanghvi Global School (Mumbai, India)** July 2017 - Aug. 2017
Project Intern
- Worked on economic sustainability and general health of villagers in Wada, Maharashtra, India
 - Initiated multiple long term projects, including water purification, flower ornament sales aimed at religious ceremonies. Helped villagers borrow 20 acres of unused farmland and farming resources free of charge.

LEADERSHIP AND SERVICES

- Oxford Invariants (Oxford Mathematics Society)** April 2018 - April 2019
Treasurer
- Oxford Mathematical Institute (Problem Solving Matters program)** June 2018 - Oct. 2018
Mentor for underprivileged high school students
- St.Nicholas Primary School, (Oxford, UK)** Oct.2016 - April 2018
Volunteer Mathematics Teacher for immigrant primary students

SKILLS AND RELEVANT COURSEWORK

Skills: Python, C++, R, JavaScript, MATLAB, Pytorch, Tensorflow
Coursework: Software Engineering, Machine Learning, Algorithms, Computation Theory, Computer Security, Linear Algebra, Group Theory, Statistics, Probability, Calculus, Numerical Analysis, Differential Equations, Algebraic Number Theory, Algebraic Geometry, Topology, Galois Theory, Set Theory