Daniyal K. Dar

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EDUCATION

Michigan State University, **College of Engineering,** East Lansing, MI
Master of Science, Computer Science Dec 2024
Cumulative GPA: 3.85/4.00
Coursework: Computer Vision, Pattern Recognition, Machine Learning, NLP, Data Mining, Biometrics

Michigan State University, **College of Engineering,** East Lansing, MI
Bachelor of Science (with Honors), Computer Science Dec 2022
Minor in Entrepreneurship and Innovation
Cumulative GPA: 3.92/4.00 (Dean's List)

RESEARCH EXPERIENCE

Michigan State University, East Lansing, MI Mar 2024 – Present
Research Assistant

- **Engineered a neural network-based adversarial audio attack pipeline** that generates imperceptible yet effective perturbations in speech data, targeting transcription models like Wav2Vec and Whisper, achieving misclassification while maintaining audio quality.
- **Improved ASR robustness evaluation** by developing and training a custom adversarial neural network, leveraging targeted transcription errors and advanced loss functions to balance attack strength with realistic, human-like audio output.
- Conducted research on adversarial robustness in speech processing, focusing on generating perturbed voice embeddings to test the resilience of machine learning models like Alexa, while synthesizing realistic human-like speech from raw embeddings

Michigan State University, East Lansing, MI May 2021 – Aug 2021
Research Assistant

- Compared simulated gene trees with real ones using "Seq-Gen" and "Fast Tree" to develop Robinson Foulds distance for determining the similarity between two gene trees based on the Jukes Cantor Model
- Poster Presenetation: D. Dar and K. Liu, "Novel algorithms and tool development for comparative genomics and phylogenomics," at 2021Mid-Michigan Symposium for Undergraduate Research Experiences (Mid-SURE) of Michigan State University, 2021. Video, Poster, Abstract

WORK EXPERIENCE

Delta Dental of Michigan, Okemos, MI Nov 2021 – May 2022
Data Science Intern

- Developed a fully automated dashboard to detect anomalies in the data using KPI to provide solutions to dental health insurance
  business needs and to support long term digital anomaly detection strategies
- Developed statistical models' strategy that increased efficiency of purchasing plan from suppliers by 10% by proactively solving potential problems

FedEx Ground, Pittsburg, PA Aug 2021 – Dec 2021
Engineering Coop

- Used fundamental data concepts to analyze operational data and identify performance improvement opportunities
- Improved the runtime efficiency by 20% of the software (TMS) used to decipher routes for package handling

Michigan State University, East Lansing, MI Dec 2022 – Aug 2023
Technical Research Assistant

- Build and maintain QMRA Wiki website. (http://qmrawiki.org) for the Microbiology department
- Develop a dashboard to detect COVID-19 in wastewater, throughout the university campus to easily visualize areas of high concentration

Michigan State University, East Lansing, MI Sep 2021 – Present
Lead Teaching Assistant - Object Oriented Software Design (CSE 335)

- Led a team of 4 TAs and 12 ULAs to coordinate course operations, ensuring smooth execution of lectures, assignments, and student support for Object-Oriented Programming while maintaining close collaboration with Professor Charles Owen.
- Facilitated student learning through weekly help rooms and forum management, providing guidance on software design and grading projects, fostering student engagement and addressing queries via the "iNTERACT" forum.

HONORS & SKILLS

ASMSU (Student Govt.), *General Assembly Member* Aug 2020 – Present
Secretary (International Students Association) Jul 2021 – May 2022
Dean's List (All Semesters)
Presidential Scholarship Recipient at MSU
International Tuition Grant Recipient at MSU
Skills:Python, C++, Object Oriented Programming, Machine Learning, Deep Learning, PyTorch, Artificial Intelligence, Flask, SQL, Git, Pandas, NumPy, HTML/CSS

Columbia University
Personal Statement
Daniyal Kabir Dar

I am a de-facto citizen of India, a native of the hotly contested Kashmir Valley that both India and Pakistan have fought two mighty wars over, and am a minority (Muslim) citizen in my home town. I have seen insurgency, militancy and political unrest all around me, and I know that amidst it all, the greatest sufferer is education. My aim is to make the potent tool of knowledge accessible and to become a professor to fulfil this cause. It has taken me a great deal of financial and mental resources to get quality higher education, and I do not wish for this shower of grooming to stop. I would like to go to Columbia to polish and fine-tune my understanding of the subject, and get deeply involved with research, doctoral studies and teaching as the ultimate step.

Coming to my academic background, at just 16 years old, I began my undergraduate studies in Computer Science, driven by a fascination with how machines could learn and adapt. By the age of 19, I had completed my bachelor's degree and immediately pursued my master's, maintaining an exceptional academic record throughout both programs. These early challenges nurtured a deep resilience within me, and I am now driven to pursue a PhD, where I can contribute to cutting-edge research in machine learning, computer vision, and AI.

I have always been fascinated by two things : Computer Science and Academia. To explore my interests, I have treated my subject as a baby and have tried to understand its nuances and subtleties through various facets. In my family, and even my extended family, no one had ever pursued a PhD. As the first in my family to embark on this journey, I see this as an opportunity not only to advance academically but to break new ground for my community and demonstrate what can be achieved through determination and intellectual curiosity.

During my master's program, I had the privilege of working under Dr. Arun Ross, a renowned professor in computer vision and pattern recognition. My research has focused on adversarial attacks on voice recognition systems, specifically how to generate unintelligible human speech that can deceive AI models while still sounding natural to humans. This research, delving into AI robustness and security, ignited my passion for pushing the boundaries of machine learning and inspired my desire to contribute further to the field.

In addition to my AI-focused research, I also worked with Dr. Kevin Liu on evolutionary computation, exploring the intersection between biology and machine learning. This interdisciplinary exposure further shaped my perspective and motivated me to pursue research that transcends traditional boundaries between fields. My aim is to harness this versatility to solve complex problems in machine learning and AI.

Further, languages help one truly comprehend the essence of a culture or belief system, and multilingualism is one of my strengths. I natively speak Kashmiri (a Dardic language), but I am well-versed with Hindi (the official language of India), Urdu (the official language of Pakistan). English (the de-facto global lingua france) and Arabic (the language of my religious scriptures). This has helped me navigate better at university, seeing as I have had to interact with multiple cultures. Having an understanding and appreciation for their culture already has made such interactions for me a lot more fruitful and fun-filled. It has also deepened my understanding of patterns on which large language models are based, thus teaching me the deep interconnectedness of technology and the world around us.

Beyond research and linguistics, I have undertaken leadership roles as a teaching assistant. I have managed a team of TAs and undergraduate assistants, organized help sessions, and ensured smooth course execution. I worked closely with students, helping them overcome technical challenges in Object-Oriented Programming and encouraging their engagement with the course material. These experiences not only honed my communication and mentorship skills but also affirmed my desire to contribute to the academic community through teaching and mentorship as a PhD student. It also cemented my love for every contour of my field.

Lastly, the PhD program at Columbia excites me because of its world-class faculty, interdisciplinary research culture, and commitment to innovation. I am eager to collaborate with leaders in AI, machine learning, and computer vision. With my background of academic excellence, research experience, and passion for innovation, I believe that I would be an asset to the Columbia Engineering community and that it is the ideal place to continue my journey of discovery and contribution. With this aspiration, I submit my application to the PhD Program at Columbia University, my dream school.