Atrey Desai

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RESEARCH INTERESTS

I am an undergraduate student in computer science and linguistics at the University of Maryland, College Park, advised by Professor Rachel Rudinger. My research interests center around developing **novel evaluation methods** that probe deeper linguistic understanding, leveraging insights from theoretical linguistics (especially semantics and pragmatics) to design more **robust** and **trustworthy** models, and enhancing the **explainability** of LLMs in reasoning tasks. I am grateful to be supported by the UMD Presidential and NMSC Merit scholarships.

EDUCATION

University of Maryland, College Park   College Park, Maryland
B.S. in Computer Science, Honors Program   *Exp. Graduation: May 2027*
- **Selected Coursework**: Data Structures, Algorithms*, Computer Systems, Data Science*, Natural Language Processing*, Machine Learning*, Discrete Math, Linear Algebra

University of Maryland, College Park   College Park, Maryland
B.A. in Linguistics, Minor in Korean Studies   *Exp. Graduation: May 2026*
- **Selected Coursework**: Syntax, Phonetics, Psycholinguistics*

PUBLICATIONS

Chace Hayhurst, Hyojae Park, **Atrey Desai**, ..., and Michael Littman (2022). *Reinforcement Learning As End-User Trigger-Action Programming.* Interactive Machine Learning Workshop at AAAI, Multi-disciplinary Conference on Reinforcement Learning and Decision Making (RLDM).

Atrey Desai, et al. (In progress). *A Comprehensive Survey on Computational Animal Language Processing.*

RESEARCH EXPERIENCE

University of Maryland, College Park   May 2024 — Present
Undergraduate Researcher | CLIP Lab (advised by Prof. Rachel Rudinger)   *College Park, MD*
- Working on improving LLM reasoning consistency in MCQA processes, focusing on analyzing partial input success and exploring various conditional generation strategies to enhance model reliability for complex language tasks.

The University of Texas at Arlington   Feb. 2024 — Present
Visiting Researcher | ACL2 Lab & National Science Foundation (advised by Prof. Kenny Zhou)   *Arlington, TX*
- Developed AniVoice-cat, a dataset of 26,000+ annotated cat vocalizations from 250+ hours of video, identifying 57 unique cat phones and expanding resources for lexical semantics and AI research in animal behavior.
- Improved vocalization transcription accuracy to 96% by implementing PANNs and HuBERT models, achieving 65% precision in cat vocalization detection and 93.89% top-5 accuracy in action recognition.

University of Maryland, College Park   Dec. 2023 — Aug. 2024
Researcher | FIRE Sustainability Analytics Lab (Advised by Prof. Thanicha Ruangmas)   *College Park, MD*
- Streamlined environmental impact assessment of U.S. emissions regulations by developing a Python-based data processing pipeline, enabling more efficient policy analysis.
- Drafted framework to inform evidence-based policymaking on climate restoration strategies.

Brown University   Dec. 2020 — June 2023
Researcher | Reinforcement Learning at Brown Group (advised by Prof. Michael Littman)   *Providence, RI*
- Created new applications of reinforcement learning to 2D non-sequential tasks, simulating real-world scenarios.
- Presented research findings at AAAI-22 IMLW and RLDM-22, demonstrating how human-readable interfaces enable fine-grained control during inference and improving AI-human interaction in robotics.

Personal Projects

- **Yelp-Help**: Developed an NLP-based classifier achieving 98.7% accuracy in vectorizing Yelp reviews, enabling precise emotional response analysis and improving customer insight extraction.

- **Archimal**: Created a high-speed CNN model achieving 95% accuracy in animal image classification, streamlining content organization and retrieval for zoological databases.

- **Trek**: Conducted statistical analysis using web crawlers and public APIs, revealing a significant positive age-performance correlation in British first-division soccer, providing actionable insights for player recruitment.

Selected Honors and Grants

Omicron Delta Kappa Top 10 Freshman	2024
CMSC & ARHU Dean's List	Fall 2023, Spring 2024
UMD President's Scholar (Top 1%)	2023—2027
NMSC National Merit Scholarship	2023—2027
Catherine Yang Award	2023
FIRST Robotics World Championship (Top 30)	2023

Students Mentored

Tanya Grover, (B.S. UMD), 2024—Present

Nakshatra Hiray, (B.S. UMD), 2024—Present

Savya Miriyala, (B.S. UMD), 2024—Present

Jessica Ononye, (B.S. UMD), 2024—Present

Professional Service

UMD Pitch Perfect Research Workshop	2024
Organizer and host; co-founded annual competition for researchers to share their work with peers and professors	
Technica Hackathon	2024
Volunteer and mentor; world's largest hackathon for underrepresented genders in tech	
FIRE Student Leadership Council	2024—Present
Councilmember; Represented 200+ peers, ran events & workshops, and work on program reforms	
CMNS Recruitment Ambassador	2024—Present
Ambassador for computer science; presented in admissions open houses and organized student meetings	
MSET Robotics & Programming Workshops	2020—2022
Organizer, curriculum designer, and volunteer; ran numerous events teaching robotics, computer modeling, and programming languages to young girls and underprivileged youth	

Additional Information

Clubs: Stylus Literary Magazine (Associate Editor), Technica Hackathon, Photography Club, Linguistics Club
Languages: Python, Java, R, MATLAB, JavaScript, HTML/CSS
Packages: PyTorch, NLTK, pandas, tidyverse, NumPy, Matplotlib
Developer Tools: Git, Docker, GCP, Google Vertex AI, VS Code, Eclipse
Natural Languages: English (native), Gujarati (native), Spanish (intermediate), Korean (beginner)