

ARCHANA YADAV

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EDUCATION

Birla Institute of Technology & Science, Pilani

Master of Engineering - Computer Science (CGPA: 8.74/10)

Hyderabad, India

2021 – 2023

University of Mumbai

Bachelor of Engineering - Computer Engineering (CGPA: 7.37/10)

Mumbai, India

2016 – 2020

EXPERIENCE

Research Intern

Aug. 2025 – Present

Microsoft Research, [Akshay Nambi](#)

- Built **Magentic Marketplace**, an open-source environment for studying two-sided agentic markets, enabling controlled evaluation of search, communication, negotiation, welfare, manipulation resistance, and behavioral biases in multi-agent economic systems.
- Co-developed **Echoverse**, a framework for automatically generating deep, stateful synthetic environments for training and evaluating computer-use agents, supporting database-grounded verification and scalable trajectory generation.
- Developed synthetic web environments and curated task distributions for **Fara 1.5**, enabling controlled generation of computer-use-agent trajectories that expanded coverage of interaction skills underrepresented in real-world web data.
- Developed a failure-centric evaluation framework for agentic systems by constructing a unified execution-level failure taxonomy and trajectory diagnostics that localize execution failures beyond final-task success.

Project Research Associate

Dec. 2023 – Aug. 2025

CFILT Lab, Indian Institute of Technology, Bombay, [Prof. Pushpak Bhattacharyya](#)

- Published a first-author **ACL 2025 Industry Track Oral** paper by developing a Bloom's Taxonomy-based framework that systematically identifies cognitive failure points in conversational AI systems.
- Developed **GriceWise**, a reference-free evaluation framework achieving Spearman correlations above 0.6 with human judgments, and constructed the **Blooms-FQ** dataset containing 3,750 follow-up questions for conversational AI evaluation.
- Built a multilingual automated closed-captioning system for Indian TV content using Whisper ASR, audio-event detection, and a curated 150-hour Hindi, Marathi, and Tamil television corpus.

NLP Research Intern

Jan. 2023 – July 2023

Speech Lab/@SCSE, Nanyang Technological University, [Prof. Chng Eng Siong](#)

- Conducted comprehensive evaluation of the implemented statistical LMs using SRILM toolkit for Text Generation of Conversational Singaporean English and Code-switching Malay-English to augment the IMDA corpus by 60%.
- Implemented novel techniques using BERTScore, BLEU score, and token length for filtering out higher-quality code-switched sentences, achieving a 6.5% decrease in the perplexity score of the Language Model of augmented code-switched sentences.

NLP Intern

July 2022 – March 2023

Textify AI

- Developed and deployed a passive-to-active voice conversion service using the PassivePy and spaCy framework, resulting in a 90% reduction of passive voice in university essays.
- Researched and analysed email quality grading metrics, including redundancy check, tone conversion, and grammar check, with enhanced email clarity and professionalism.
- Developed and fine-tuned several models for multi-label classification, summarisation, question-answering systems and formality style transfer.

Teaching Assistant

Sept. 2021 – Dec. 2022

Birla Institute of Technology & Science, Pilani

- Courses: Approximation Algorithms, Deep Learning, Advanced Algorithms and Complexity.

PUBLICATIONS

- From Recall to Creation: Generating Follow-Up Questions using Bloom's Taxonomy and Grice's Maxims:** Archana Yadav, Harshvivek Kashid, Pushpak Bhattacharyya. **ACL 2025 (Industry Track) - Oral Presentation** [[Paper Link](#)]
- Magentic Marketplace: An Open-Source Environment for Studying Agentic Markets.** Submitted to ICLR 2026 (Under Review) [[Paper Link](#)]
- Echoverse: Deep, Evolving Environments for Training Computer-Use Agents at Scale.** Preprint [[Paper Link](#)]

- **Whisper-ing with Subtitles: Making TV Shows Chatty for All:** Archana Yadav, Pushpak Bhattacharyya. Submitted to ARR August 2024 [Pre-print]

PROJECTS

Document Classification on FinCausal and BBC News Classification Dataset [\[GitHub\]](#)

- Tested Hierarchical Attention Network architecture for document classification of BBC News dataset, with dynamic batching and achieving ~90% accuracy.
- Implemented BERT model for the FinCausal dataset classification task with an F1-score of 0.97.

Conversational Dataset Fine-Tuning of LLaMA-3 using Unsloth and LoRA [\[GitHub\]](#)

- Fine-tuned LLaMA-3 (1B and 3B) models using Unsloth and LoRA on multi-turn conversational data subset (FineTome-100k), achieving improved coherence and response formatting in under 5 minutes on a single GPU.

Simulation of PoET - Proof of Elapsed Time - Blockchain Consensus Mechanisms

- Developed a blockchain-based land management platform using Proof of Elapsed Time (PoET) consensus, optimising for secure, energy-efficient property transactions and transparent ownership tracking.
- Implemented cryptographic tokenisation for property assets, leveraging Merkle Root to ensure tamper-proof transaction records.

TECHNICAL SKILLS

Programming Languages: Python, C/C++, Shell Script

Frameworks and Libraries: vLLM, PyTorch, Huggingface, FairSeq, SciPy, fast.ai, Unsloth, LangChain, Tensorflow

Developer Tools: Git, Docker, Google Cloud Platform

Research Areas: Agentic Systems, AI Evaluation, Conversational AI, Large Language Models, Synthetic Environments, Speech Processing