Nischal Ashok Kumar

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SUMMARY

Fourth-year PhD candidate in Computer Science at UMass Amherst specializing in Machine Learning (ML) and Natural Language Processing (NLP). Research focuses on controlled generation, user modeling, and personalization, with expertise in LLM prompting, fine-tuning, and alignment (RLHF, DPO, GRPO).

EDUCATION

University of Massachusetts (UMass), Amherst — **Sept 2022 - Aug 2027 (Expected)**
Doctor of Philosophy (PhD), Computer Science — ***GPA: 4.0/4.0***

Indian Institute of Technology (IIT), Patna — **July 2018 - May 2022**
Bachelor of Technology (B.Tech), Computer Science and Engineering — ***CGPA: 9.38/10**, Institute Rank: 3/265*

EXPERIENCE

Research Assistant, CICS UMass — **Amherst, MA, USA**
Advisor: Prof. Andrew Lan — *Sept 2022 - Present*

Project: ML and NLP for Educational Applications
- Tailoring LLMs for providing conversational creative writing feedback using Reinforcement Learning - DPO/ GRPO.
- Worked on projects involving personalization in long-form story generation, math word problem generation, and pedagogical question generation using prompting, LLM fine-tuning, and multi-agent systems.

Applied Scientist Intern, Amazon Web Services — **New York City, USA**
Mentors: Peng Shi, Lin Pan, Zhiguo Wang — *June 2024 - Sept 2024*

Project: Multi-Document Query Aware Table Generation using Retrieval-Augmented-Generation (RAG)
- Studied table generation given a query and a corpus of news articles using RAG simulating a needle-in-the-haystack. Proposed an automatic pipeline to extend any table dataset to query, article pairs grounded in the ChartQA dataset.

Applied Scientist Intern, Amazon Web Services — **New York City, USA**
Mentors: Marvin Dong, Jiarong Jiang, Zhiguo Wang — *June 2023 - Sept 2023*

Project: Practical Conversational text-to-SQL systems
- Identified five ambiguous and four unanswerable categories of user questions in conversational text-to-SQL systems. Proposed a synthetic data generation pipeline and benchmarked the dataset with SoTA LLMs.

Research Scientist Intern, SciSpace — **Bangalore, India**
Mentor: Dr. Tirthankar Ghosal — *May 2022 - August 2022*

Project: Multi-Modal Slides and Poster Generation from Scientific Articles
- Built an end-to-end LLM-based system for automatically generating slides and posters for over 2M scientific articles.

Research Assistant, AI-NLP-ML Lab — **IIT-Patna, India**
Advisor: Prof. Asif Ekbal — *July 2019 - May 2022*

Project: Explainable Multi-Modal Novelty and Emotion based Fake News Detection
- Developed a multi-modal contrastive learning model with background knowledge, improving SoTA by 7%.
- Built a multi-task neural network using novelty and emotion recognition achieving SoTA on four popular datasets.

Research Intern, IBM Research AI — **Bangalore, India**
Mentors: Nitin Gupta, Hima Patel — *May 2021-Aug-2021*

Project: Detecting Ambiguity in Input-Output Annotations for Programming By Example (PBE) Systems
- Identified ambiguity in data transformation programs and built an interpretable multi-task model for ambiguity detection.

Research Intern, DKE Group — **University of Wuppertal, Germany**
Advisors: Dr. Terry Ruas Prof. Bela Gipp — *Dec 2020-May 2021*

Project: Analysis of Transfer Learning Approaches for detecting Health Fake News
- Pre-trained language models including BERT, RoBERTa, and DeBERTa on CORD-19 and showed corpus-specific tokenizers offer no clear advantage over general-purpose models for health fake news detection.

Research Intern, Video Analytics Laboratory — **Indian Institute of Science, Bangalore, India**
Advisor: Prof. Venkatesh Babu — *May 2020-Aug 2020*

Project: Unlabeled Data from Different Distribution for Adversarial Robustness
- Designed hybrid loss functions (Cross-Entropy + KL) and applied Data-Enriching GANs for domain adaptation between CIFAR-100 and CIFAR-10, showing unlabeled cross-domain data performs within 2% of fully supervised models under FGSM and PGD-20 attacks.

SELECTED PUBLICATIONS

* denotes equal contribution

- **N Ashok Kumar**, C.M. Pham, M. Iyyer, A. Lan **"Whose story is it? Personalizing story generation by inferring author styles"**, AACL-IJCNLP 2025 Main Conference [To Appear] [Paper] [Code]
- **N Ashok Kumar***, M Dong*, Y Hu, et al. **"PRACTIQ: A Practical Conversational text-to-SQL dataset with Ambiguous and Unanswerable Queries"**, NAACL 2025 Main Conference [Paper]
- **N Ashok Kumar**, W Feng, J Lee, H McNichols, A Ghosh, A Lan, **"A Conceptual Model for End-to-End Causal Discovery in Knowledge Tracing"**, 16th International Conference on Educational Data Mining (EDM 2022) [Paper] [Code]
- **N Ashok Kumar**, A Lan, **"Improving Socratic Question Generation using Data Augmentation and Preference Optimization"**, 19th BEA Workshop at NAACL-2024. [Paper] [Code]
- **N Ashok Kumar**, A Lan, **"Using Large Language Models for Student Code Guided Test Case Generation for Computer Science Education"**, AI4ED Workshop at AAAI-2024 [***Best Runner-Up Paper***] [Paper] [Code]
- **N Ashok Kumar**, N Fernandez, Z Wang, A Lan, **"Improving Reading Comprehension Question Generation with Data Augmentation and Over-generate-and-rank"**, 18th BEA Workshop at ACL-2023 [***Outstanding Paper***][Paper] [Code]
- **N Ashok***, R Kumari*, T Ghosal and A Ekbal, **"A Multi-task Learning Approach for Fake News Detection: Novelty, Emotion, and Sentiment Lend a Helping Hand"**, International Joint Conference on Neural Networks, [Paper] [Code]
- **N Ashok***, JP Wahle*, T Ruas, N Meuschke, T Ghosal and B Gipp, **"Testing the Generalization of Neural Language Models for Covid-19 Misinformation Detection"**, iConference 2022 [Paper] [Code]
- V Gupta, R Kumari, **N Ashok**, T Ghosal and A Ekbal , **"MMM: An Emotion and Novelty-aware Approach for Multilingual Multimodal Misinformation Detection"**, Findings of the AACL-IJCNLP 2022 [Paper] [Code]

Pre-prints

- **N Ashok Kumar***, M.C. Peczuh*, R. Baker, et al., **"Toward LLM-Supported Automated Assessment of Critical Thinking Subskills"** [Under Review LAK 2026] [Paper]

AWARDS and HONORS

- **UMass Victor Lesser Scholarship in Artificial Intelligence, 2023** - Awarded to a top Ph.D. student specializing in AI.
- **UMass Common Good Fellowship, 2023** - Awarded for conducting research in AI for Education.
- **UMass CICS Doctoral Scholarship, 2022** - Awarded Entry scholarship ($4,000) among Fall 2022 admits.
- **IIT Patna B.Tech Merit List, 2022** - Ranked 3rd in the graduating class of 265 students.
- **IIT Patna Best CSE Undergraduate Thesis Nomination, 2022** - Nominated for my research on fake news detection.
- **Indian Academy of Sciences Research Fellow, 2020** - Awarded for conducting AI research internship at IISc Bangalore.
- **Govt. of India KVPY Fellowship, 2016** - Ranked in the top 0.2% of 200,000 students nationwide for pursuing research.
- **Academic Excellence Award, 2016** - Ranked 2nd among 30,000 students in the ICSE 10th Standard exam.

SERVICE AND LEADERSHIP

- **Ph.D. Mentor** — Mentored M.S. students through the CS696DS Industry Mentorship Program (with Meta) and undergraduate researchers via URV (2023–present).
- **Program Committee Member** — BEA Workshop at ACL 2023, NAACL 2024, and AI4ED Workshop at AAAI 2024, 2025.
- **Volunteer** — Ph.D. Application Support Program (PASP), and New Student Committee, UMass CICS.
- **Head of ML and AI**, NJACK (CS Club, IIT Patna) — Introduced the NJACK ML Workshop Series.
- **Departmental Lead**, DSC IIT Patna — Facilitated the Explore-ML Workshop Series powered by Google AI.
- **Teaching and Writing** — Conducted ML/AI teaching sessions [Talks] and authored technical blogs [Blog] on ML and AI.
- **Lead**, Entrepreneurship Cell, IIT Patna — Introduced the Entrepreneur-101 Series and organized talks on entrepreneurship.
- **Social Worker**, National Service Scheme (IIT Patna) — Led the rural entrepreneurship division.

SKILLS

- **Programming Languages:** Python, C/C++, Java, Bash
- **ML & NLP Frameworks:** PyTorch, HuggingFace Transformers, vLLM, SGLang, LangChain, OpenAI API
- **LLM Development:** Prompt design, Fine-tuning (LoRA, PEFT), Preference optimization (RLHF, DPO, GRPO), LLM-as-a-judge, Human–LLM evaluation and analysis
- **Data & Experimentation:** Pandas, NumPy, SQL, Weights & Biases, Docker, Git/GitHub
- **Writing & Reproducibility:** LaTeX, Overleaf, Markdown, Jupyter Notebooks