Nischal Ashok Kumar

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SUMMARY

Fifth-year PhD candidate in Computer Science at UMass Amherst working on LLMs for user-centered applications, including social media, code generation, education, and creative writing. Research spans controlled generation, user modeling, retrieval, personalization, conversational AI, and evaluation, via post-training (RLHF), retrieval-augmented generation (RAG), and multi-agent systems. Strong industry research experience across Netflix, AWS, IBM Research, and SciSpace. Author of 15+ publications at venues including EMNLP, ACL, NAACL, AACL, AAAI, KDD, AIED, and EDM.

EDUCATION

University of Massachusetts (UMass), Amherst — **Sept 2022 - Jan 2027 (Expected)**
Doctor of Philosophy (PhD), Computer Science, advised by Prof. Andrew Lan — ***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

AI Research Intern, Netflix — **Los Gatos, CA, USA**
Steerable Multi-Objective Generative Retrieval for Conversational Search — *June 2026 – Aug 2026*

- Fine-tuned LLMs for steerable generative recommendations of Netflix titles on user search queries, improving Precision@10 metric by 23 percentage points over the non-steerable baseline.

Applied Scientist Intern, Amazon Web Services — **New York City, USA**
Multi-Document Query Aware Table Generation using RAG — *June 2024 – Sept 2024*

- Proposed an automatic pipeline to extend any table dataset to query, article pairs grounded in the ChartQA dataset, and benchmarked SoTA LLMs for the needle-in-the-haystack task.

Applied Scientist Intern, Amazon Web Services — **New York City, USA**
Practical Conversational Text-to-SQL Systems — *June 2023 – Sept 2023*

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

Research Scientist Intern, SciSpace — **Bangalore, India**
Multi-Modal Slides and Poster Generation from Scientific Articles — *May 2022 – Aug 2022*

- Built an end-to-end LLM-based system for automatically generating slides and posters for over 2M scientific articles.

Research Intern, IBM Research AI — **Bangalore, India**
Detecting Ambiguity in Input-Output Annotations for Programming By Example (PBE) Systems — *May 2021 – Aug 2021*

- Identified ambiguity in data transformation programs and built an interpretable multi-task model for ambiguity detection.

SELECTED RESEARCH

Personalization and User Modeling

Personalized Story Generation — *AACL-IJCNLP 2025*

- Personalized long-form story generation by inferring author-specific writing styles from their prior works, achieving a 78% win-rate over non-personalized baselines on a 3.6K-story, 112-author dataset.

Personalized Math Word Problem Generation — *AIED 2025*

- Built a multi-agent iterative framework with four agents, cutting failures like realism and authenticity across 600 ASSISTments problems and 20 student-interest topics within one iteration.

LLM Alignment using RLHF

Human-Like Feedback Editor via Test-Time Reward Ascent — *Ongoing*

- Built an editor model that revises stories using word-level gradient ascent on a reward model simulating human feedback, as an alternative to standard DPO/GRPO alignment.

Socratic Question Generation for Tutoring — *BEA @ NAACL 2024*

- Augmented Socratic questioning data with invalid-question examples and optimized LLaMA-2 via DPO to prefer valid questions, outperforming GPT-4 prompting by 4% F1.

Retrieval and Re-ranking

Context Pruning in Deep Research Agents — *EMNLP 2026 Findings*

- Ran the first systematic stage-aware comparison of context-pruning strategies in deep research pipelines, cutting token usage by up to 73% with minimal quality loss.

Reading Comprehension Question Generation — *BEA @ ACL 2023, Outstanding Paper*

- Proposed a data augmentation and overgenerate-and-rank method to select pedagogically optimal questions from diverse candidates, improving ROUGE-L by 5% over prior state-of-the-art on FairytaleQA.

Datasets and Benchmark

Critical Thinking Benchmark for Essay Scoring — *EDM 2026, Best Full Paper Nomination*

- Built a coding rubric and human-annotated corpus of 500 argumentative essays spanning six critical thinking subskills, then benchmarked prompting GPT-5 and fine-tuning LLaMA to automatically score subskill proficiency.

Multilingual Multimodal Misinformation Detection — *AACL-IJCNLP 2022 Findings*

- Built a 10,473-sample multilingual multimodal misinformation dataset across Hindi, Bengali, and Tamil, with a novelty- and emotion-aware model improving accuracy by 21.77 points over baseline and 8.8 over prior SOTA.

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 annotation, evaluation, and analysis
- **Data & Experimentation:** Pandas, NumPy, SQL, Weights & Biases, Docker, Git/GitHub
- **Writing & Reproducibility:** LaTeX, Overleaf, Markdown, Jupyter Notebooks

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 [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] [Code]

N Ashok Kumar*, M.C. Peczuh*, R. Baker, et al., **"Toward LLM-Supported Automated Assessment of Critical Thinking Subskills"**, EDM 2026 **[*Best Full Paper Nomination (Top-2)*]** [Paper] [Code]

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"**, 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"**, IJCNN 2021, [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]

H. Kolukuluru, R. Ashok, K. Arora, E.W. Ciccarelli, **N Ashok Kumar**, et al., **"Not Worth Another Token: Marginal Value Estimation for Efficient Deep Research Agents"**, EMNLP 2026 Findings [Paper]

V Gupta, R Kumari, **N Ashok**, T Ghosal and A Ekbal , **"MMM: An Emotion and Novelty-aware Approach for Multilingual Multimodal Misinformation Detection"**, AACL-IJCNLP 2022 Findings [Paper] [Code]

AWARDS and HONORS

Best Paper Awards — EDM 2026 (nominated), AI4ED at AAAI 2024 (runner-up), BEA at ACL 2023 (outstanding paper).

UMass Victor Lesser Scholarship in Artificial Intelligence, 2023 — Awarded to a single 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 11 M.S. students (with Adobe, Meta, and Graphite) through CS696DS and 11 undergraduate students via URV and ML4ED lab.

Program Committee Member — BEA Workshop at *ACL 2023-2026, and AI4ED Workshop at AAAI 2024, 2025.

IIT Patna Clubs — Head of Machine Learning - NJACK CS Club, Head of Industrial Relations - Entrepreneurship Cell.