

# Nischal Ashok Kumar

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## SUMMARY

Machine Learning and NLP researcher working on controlled generation, user modeling, and personalization. Skilled in LLM prompting, fine-tuning, and alignment (RLHF/DPO/GRPO), with experience in user-focused NLP research.

## EDUCATION

**University of Massachusetts (UMass), Amherst**

*Doctor of Philosophy (MS-PhD), Computer Science*

**Sept 2022 - Aug 2027 (Expected)**

**GPA: 4.0/4.0**

**Indian Institute of Technology (IIT), Patna**

*Bachelor of Technology (B.Tech), Computer Science and Engineering*

**July 2018 - May 2022**

**CGPA: 9.38/10, Institute Rank: 3/265**

## EXPERIENCE

**Research Assistant, CICS UMass**

*Advisor: • Prof. Andrew Lan*

**Amherst, MA, USA**

*Sept 2022 - Present*

• **Project: ML and NLP for Educational Applications**

• Tailoring LLMs for providing effective creative writing feedback using Reinforcement Learning - DPO/ GRPO.

• Worked on projects including personalization in long-form stories, math word problems, and generating pedagogical questions using both prompting and fine-tuning LLMs.

**Applied Scientist II Intern, Amazon Web Services**

*Mentors: • Peng Shi • Lin Pan • Zhiguo Wang*

**New York City, USA**

*June 2024 - Sept 2024*

• **Project: Multi-Document Query Aware Table Generation**

• Studied the task of generating tables given a query and a corpus of news articles. Proposed an automatic pipeline to extend any table dataset to query, article pairs grounded in the ChartQA dataset and benchmarked different RAG techniques.

**Applied Scientist II Intern, Amazon Web Services**

*Mentors: • Marvin Dong • Jiarong Jiang • Zhiguo Wang*

**New York City, USA**

*June 2023 - Sept 2023*

• **Project: Towards Practical Conversational Text-to-SQL systems**

• Identified 5 ambiguous and 4 unanswerable categories of user questions in conversational Text-to-SQL systems. Proposed an automatic data generation pipeline and benchmarked the dataset with SOTA LLMs.

**Research Scientist Intern, SciSpace**

*Advisor: • Dr. Tirthankar Ghosal*

**Bangalore, India**

*May 2022 - August 2022*

• **Project: Multimedia (Slides and Poster) Generation from Scientific Articles**

• Built an end-to-end service for creating long, medium, and elevator-pitch slides with posters for over 2M scientific articles

**Undergraduate Researcher, AI-NLP-ML Lab**

*Advisor: • Prof. Asif Ekbal*

**IIT-Patna, India**

*July 2019 - May 2022*

• **Undergraduate Thesis: Explainable Multi-Modal Novelty and Emotion based Fake News Detection**

• Proposed a novel contrastive learning approach using novelty and emotion for multimodal fake news with retrieved background knowledge, which gives 7% improvement over the previous state-of-the-art (SOTA).

• Proposed a novel multi-tasking neural network architecture giving SOTA results on 4 datasets (ByteDance, FNC, Covid-Stance, and FNID with 7.73%, 3.69%, 7.95%, and 13.38% improvement) which has been integrated with Wipro Research

**Summer Research Intern, IBM Research AI**

*Research Managers: • Nitin Gupta • Hima Patel*

**Bangalore, India**

*May 2021-Aug-2021*

• **Project: Detecting Ambiguity in Input-Output Annotations for Programming By Example (PBE) Systems**

• Identified five ambiguous properties that hinder the generalization of data transformation programs and proposed an interpretable multi-task neural network architecture for detecting ambiguity.

**Undergraduate Researcher, DKE Group**

*Advisors: • Dr. Terry Ruas • Prof. Dr. Bela Gipp*

**University of Wuppertal, Germany**

*Dec 2020-May 2021*

• **Project: Analysis of Transfer Learning Approaches for detecting Covid-19 Fake News**

• Performed masked-language-modeling (MLM) based pre-training of general neural language models (BERT, RoBERTa, DeBERTa, etc.) on Covid-19 corpus, CORD-19. Showed empirically that tokenizers and models tailored to the CORD-19 corpus do not provide a significant advantage over general-purpose ones.

**AI Research Intern, Video Analytics Laboratory**

*Advisor: • Prof. Venkatesh Babu*

**Indian Institute of Science, Bangalore, India**

*May 2020-Aug 2020*

• **Project: Unlabeled Data from Different Distribution for Adversarial Robustness**

• Constructed new loss functions combining Cross-Entropy and KL Divergence. Performed domain adaptation using Data-Enriching GANs between Cifar-100 and Cifar-10 datasets. Showed that unlabeled data from a different distribution is as competitive as the fully-supervised setting (within 2% error margin) against iterative FGSM and PGD-20 attacks.

## SELECTED PUBLICATIONS

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\* 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

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- **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

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- **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 3<sup>rd</sup> 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 2<sup>nd</sup> among 30,000 students in the ICSE 10<sup>th</sup> Standard exam.

## SERVICE AND LEADERSHIP

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- **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

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- **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