

Nischal Ashok Kumar

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SUMMARY

Researcher designing ML and NLP algorithms for the Educational Domain

EDUCATION

University of Massachusetts (UMass), Amherst

Sept 2022 - Present

Doctor of Philosophy (MS-PhD), Computer Science

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

ML-NLP Research Scientist Intern, [SciSpace](#)

Bangalore, India

Advisor: • [Dr. Tirthankar Ghosal](#)

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
- Proposed novel pipeline consisting of multi-modal information extraction using clustering-based extractive summarizer, sentence-transformer based image ranker and multi-tasking SciBERT based contribution statements retriever

Undergraduate Researcher, [AI-NLP-ML Lab](#)

IIT-Patna, India

Advisor: • [Prof. Asif Ekbal](#)

July 2019 - May 2022

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

- Proposed a novel pipeline for natural language based explainability for multimodal fake news using evidence from the web
- Proposed a novel contrastive learning approach using novelty and emotion for multimodal fake news with self-procured 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

Undergraduate Researcher, [University of Illinois](#)

Chicago, IL, USA

Advisor: • [Prof. Cornelia Caragea](#)

Nov 2021- Feb 2022

• **Project: Critical Question Generation from Peer Reviews**

- Procured a novel dataset of peer-review based critical questions using an unsupervised algorithm with 97.5% recall and built a BART-based multi-task framework for question generation and aspect tagging.

Summer Research Intern, [IBM Research AI](#)

IBM Research, Bangalore, India

Research Managers: • [Nitin Gupta](#) • [Hima Patel](#)

May 2021-Aug-2021

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

- Discovered five ambiguous properties that hinder the generalization of data transformation programs.
- Proposed a self-explainable multi-task neural network for detecting ambiguity and demonstrated that the architecture improves performance of PBE modules by pointing regions of ambiguity hence generating programs as per user's intent.

Undergraduate Researcher, [DKE Group](#)

University of Wuppertal, Germany

Advisors: • [Dr. Terry Ruas](#) • [Prof. Dr. Bela Gipp](#)

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](#)

Indian Institute of Science, Bangalore, India

Advisor: • [Prof. Venkatesh Babu](#)

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.

Data Science Intern, [TildeHat](#)

Bangalore, India

Manager: • [Dr. Om Deshmukh](#)

Dec 2019-Jan 2020

• **Project: Unsupervised Data Retrieval from Resumes**

- Implemented unsupervised algorithms and hierarchical classifier approaches for information retrieval of fields like Name, Skills, Education, Projects and others from resumes by analyzing its HTML DOM structure.

SELECTED PUBLICATIONS

* denotes equal contribution

- **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***, R Kumari*, T Ghosal and A Ekbal, "**Misinformation detection using multitask learning with mutual learning for novelty detection and emotion recognition**", Journal of Information Processing and Management, Elsevier, IPM-2021, (Impact Factor: 6.222) [[Paper](#)] [[Code](#)] [[WHO Website](#)]
- **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**", International Conference on Information, iConference 2022, Springer [[Paper](#)] [[Code](#)]
- **N Ashok***, R Kumari*, P Agarwal, T Ghosal and A Ekbal, "**NovEmoFake: Identifying Online Multimodal Misinformation Leveraging Novelty Detection and Emotion Recognition**", Information Processing and Management Conference 2022 [under review]
- **N Ashok**, R Kumari, V Gupta, T Ghosal and A Ekbal, "**FakeXplain: Evidence-Based Multi-Modal Fake News Detection**", ACM Conference on Computational Linguistics (COLING-2022) [under review]
- **N Ashok**, N Gupta, S Guttula and H Patel, "**Ambiguity Detection in User Provided Annotations in PBE Systems**" [under review]
- **N Ashok***, A Kumar*, T Ghosal, and C Caragea, "**QPeer: On Generating Deep Scientific Peer Review Questions**", AACL-IJCNLP 2022 [under review]

AWARDS and HONORS

- **UMass CICS Doctoral Scholarship** - Received scholarship of 4000\$ among the Fall-2022 admits
- **IIT-Patna Merit List** - 3rd Rank for the institute in the IIT-Patna B.Tech Class of 2022.
- **Summer Research Fellow 2020** - (Indian Academy of Sciences) for pursuing a research internship in AI at IISc Bangalore.
- **Fellowship (KVPY'2016)** - Young Scientist Incentive Plan Govt. of India. Stood among top 0.2% among 200,000 students.
- **Academic Excellence Award** - Ranked 2nd among 100,000 students in 10th Standard public exam (ICSE'2016).

SERVICE and LEADERSHIP

- **Conference Volunteer** - NAACL-2021, ICML-2021, ACL-IJCNLP-2021
- **Reviewer** - Expert Systems with Applications Journal, CIKM-2021 Conference, IEEE Transactions on Computational Social Systems, IEEE Internet of Things Journal, Information Processing and Management Journal
- **Head of ML and AI** - NJACK - CS Club (IIT-Patna) - Introduced NJACK ML Workshop Series.
- **Departmental Lead** - DSC IIT-P - Associate Facilitator of Explore-ML Workshop IIT-P powered by Google-AI
- **Mentor** - Institute Student Mentorship Program (IIT-Patna) (2020-2022)
- **Project Mentor** - NJACK Winter of Code Open Source Programme'2019 - [[ML Project Link](#)]
- **Facilitator** - Delivered four (one-hour) talks in the Reinforcement Learning Seminar Series - IBM Research AI
- **Teaching** [[Link](#)] and **writing blogs** [[Link](#)] on ML and AI
- **Lead** - Entrepreneurship-Cell IIT-Patna - Introduced Entrepreneur-101 series and organized 4 sessions on entrepreneurship.
- **Social Worker** - National Service Scheme IIT-Patna - Led the rural entrepreneurship division.

SKILLS

- **Programming Languages:** • Python • C/C++ • Java • Bash • Verilog • Assembly
- **Deep Learning Tools:** • PyTorch • HuggingFace • AllenNLP • Tensorflow • Keras
- **Other tools:** • SQL • Docker • L^AT_EX • Git/GitHub