Abhijnan Nath

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Education

PhD in Computer Science | ***AI/NLP/4.0 GPA*** Jan '23 – May '26 (expected)
Colorado State University, Fort Collins, CO Fort Collins, CO
Advisor: Dr. Nikhil Krishnaswamy

MS in Computer Science | ***AI/NLP*** Jan '21 – Dec '22
Colorado State University, Fort Collins, CO Fort Collins, CO
Advisor: Dr. Nikhil Krishnaswamy

M.Sc. (Integrated with BS) | ***Physics*** Aug '09 – Aug '13
Birla Institute of Technology and Science, Pilani Pilani, India

Work Experience

Applied Scientist II Intern July '25 – Oct '25
Amazon Science

- Designed novel **causal credit assignment** algorithms for LLM-based search and recommendation, improving reward attribution and retrieval quality.
- Led **multi-GPU scaling and optimization** of RL training pipelines, achieving superior performance over state-of-the-art baselines such as GRPO across multiple product recommendation benchmarks.

PhD Research Intern April '25 – July '25
Cresta Intelligence Inc.

- Email Agent with Reinforcement Learning: Implemented an agentic framework for a RAG-enhanced email writing system for Square.
- Led experimental work for upgrading base foundational LLMs for customer calls summarization.

PhD Research Intern May '24 – Oct '24
Optum AI/UnitedHealth Group

- LLM Post-training: Preference Alignment in LLMs with Supervised Learning
- Developed novel alignment algorithms for Diverse Preference Learning in healthcare

LLM Research Intern May '23 – Aug '23
Sprouts AI

- Designed, optimized, and productionized various LLM pipelines for personalized outreach
- Productionized in-context learning frameworks using sequencing platforms like Langchain and Knowledge-Retrieval systems with RAG.

Graduate Research Assistant Dec '21 – Present
SIGNAL Lab, Colorado State University

- Developed Information-Theoretic approaches and algorithms in developing frictive LLM agents in collaborative games.
- Developed end-to-end pipeline for neural (embedding-based and lexical) CDCR for events and entities
- Developed LLM alignment pipelines for distribution-based knowledge distillation at scale
- Designed and implemented the affine-mapping based semantic transfer pipeline between various BERT-type Language Models (LM) and vision transformers to enhance multimodal-CDCR
- Received Travel Support for NAACL '24 (Mexico City), LREC-COLING '24 (Turin, Italy), ACL '23 (Toronto, Canada) and COLING '22 (Gyeongju, South Korea)

Honors and Awards

Awarded Wim Böhm Ph.D. Fellowship in Computer Science, 2025
Department of Computer Science, Colorado State University, Fort Collins, CO

Evolutionary Computing and Artificial Intelligence Graduate Fellowship 2024
Department of Computer Science, Colorado State University, Fort Collins, CO

Best Student Paper Award
International Conference on Educational Data Mining (EDM) 2024, Atlanta, GA

PhD Candidacy with Distinction, December 2024
Colorado State University, Fort Collins, CO

Publications

1. **Learning "Partner-aware" Collaborators in Multi-Party Collaboration**
   Abhijnan Nath, Nikhil Krishnaswamy
   (Accepted at NeurIPS 2025 Main Track). paper

2. **Let's Roleplay: Examining LLM Alignment in Collaborative Dialogues**
   Abhijnan Nath, Carine Graff, Nikhil Krishnaswamy
   (Origen Workshop (COLM 2025)). paper

3. **Frictional Agent Alignment Framework: Slow Down and Don't Break Things**
   Abhijnan Nath, Carine Graff, Andrei Bachinin, Nikhil Krishnaswamy
   (ACL Main 2025). paper

4. **Dynamic Epistemic Friction in Dialogue**
   Timothy Obiso, Kenneth Lai, Abhijnan Nath, Nikhil Krishnaswamy, James Pustejovsky
   (ACL 2025 Workshop CoNLL). paper

5. **Simultaneous Reward Distillation and Preference Learning: Get You a Language Model Who Can Do Both**
   Abhijnan Nath, Changsoo Jung, Ethan Seefried, Nikhil Krishnaswamy
   preprint

6. **DPL: Diverse Preference Learning Without A Reference Model**
   Abhijnan Nath,Andrey Volozin, Saumajit Saha, Albert Aristotle Nanda, Galina Grunin, Rahul Bhotika, Nikhil Krishnaswamy
   (**Oral**, Accepted at NAACL Main 2025). paper

7. **"Any Other Thoughts, Hedgehog?" Linking Deliberation Chains in Collaborative Dialogues**
   Abhijnan Nath, Videep Venkatesha, Mariah Bradford, Avyakta Chelle, Austin Collin Youngren, Carlos Mabrey, Nathaniel Blanchard, Nikhil Krishnaswamy.
   (Published at Findings of EMNLP 2024). paper

8. **Okay, Let's Do This! Modeling Event Coreference with Generated Rationales and Knowledge Distillation**
   Abhijnan Nath, Shadi Manafi, Avyakta Chelle, and Nikhil Krishnaswamy.
   (**Oral**, Published at NAACL Main 2024). paper

9. **Multimodal Cross-Document Event Coreference Resolution Using Linear Semantic Transfer and Mixed-Modality Ensembles**
Abhijnan Nath, Huma Jamil, Shafiuddin Rehan Ahmed, George Baker, Rahul Ghosh, James H. Martin, Nathaniel Blanchard, and Nikhil Krishnaswamy.
(Published at LREC-COLING 2024). paper

10. **Propositional Extraction from Natural Speech in Small Group Collaborative Tasks**
Videep Venkatesha, Abhijnan Nath, Ibrahim Khebour, Avyakta Chelle, Mariah Bradford, Jingxuan Tu, James Pustejovsky, Nathaniel Blanchard, and Nikhil Krishnaswamy
(**Best Paper Award at EDM 2024**).

11. **AxomiyaBERTa: A Phonologically-aware Transformer Model for Assamese**
Abhijnan Nath, Sheikh Mannan, and Nikhil Krishnaswamy
(Published at Findings of ACL 2023). paper

12. **2*n is better than n^2: Decomposing Event Coreference Resolution into Two Tractable Problems**
Shafiuddin Rehan Ahmed, Abhijnan Nath, James H. Martin, and Nikhil Krishnaswamy
(Published at Findings of ACL 2023). paper

13. **How Good is the Model in Model-in-the-loop Event Coreference Resolution Annotation?**
Shafiuddin Rehan Ahmed, Abhijnan Nath, Michael Regan, Adam Pollins, Nikhil Krishnaswamy, and James H. Martin
(Published at the Linguistic Annotation Workshop, ACL 2023). paper

14. **A Generalized Method for Automated Multilingual Loanword Detection**
Abhijnan Nath, Sina Mahdipour Saravani, Ibrahim Khebour, Sheikh Mannan, Zihui Li, and Nikhil Krishnaswamy
(Published at COLING 2022) paper

15. **Phonetic, Semantic, and Articulatory Features in Assamese-Bengali Cognate Detection**
Abhijnan Nath, Rahul Ghosh, and Nikhil Krishnaswamy
(Published at VarDial 2022) paper

16. **Linear Mappings: Semantic Transfer from Transformer Models for Cognate Detection and Coreference Resolution**
Abhijnan Nath
MS Thesis. Colorado State University, 2022. paper

Teaching Experience

Graduate Teaching Assistant — Spring 2024
CS 445: Introduction to Machine Learning — Colorado State University

Graduate Teaching Assistant — Fall 2023
CS 542: Natural Language Processing — Colorado State University

Graduate Teaching Assistant — Fall 2021
CS 320: Algorithm Theory and Practice — Colorado State University