

# AMANUL HAQUE

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## EDUCATION

<b>Doctor of Philosophy (PhD) in Computer Science</b> North Carolina State University, Raleigh, NC With a focus on Artificial Intelligence, Machine Learning, and Natural Language Processing	● CGPA - <b>4.0/4</b>	<i>Expected Dec 2024</i>
<b>Master of Science in Computer Science</b> North Carolina State University, Raleigh, NC	● CGPA - <b>4.0/4</b>	<i>May 2019</i>
<b>Bachelor of Engineering in Information Science</b> PES University, Bangalore, India	● CGPA - <b>8.76/10</b>	<i>May 2015</i>

## AWARDS AND HONORS

• Graduate Student Leadership Award 2023	<i>Awarded by NC State University</i>
• Outstanding Teaching Assistant Award 2021	<i>Awarded by NC State University</i>

## MISSION STATEMENT

*Passionate about advancing AI-driven innovations—particularly in LLMs and agentic workflows—to solve real-world problems and promote sustainable progress in overcoming critical social challenges and barriers to AI adoption.*

## PROFESSIONAL EXPERIENCE

<b>Laboratory of Analytical Science (LAS), Summer Research Fellowship at SCADs</b>	<i>June 2024 - July 2024</i>
• Designed and implemented a multi-agent LLM-based abstractive text summarizer to generate balanced summaries from conflicting documents. Our approach ensures that generated summaries capture diverse perspectives.	
• Developed an automated evaluation utilizing LLMs as evaluators to assess the quality of generated summaries.	
<b>Coupang, Mountain View, California, Machine Learning Summer Intern</b>	<i>May 2022 - Aug 2022</i>
• Improved Coupang’s Deep & Cross Network (DCN) model’s efficiency by removing spurious features.	
• Automated benchmarking on public datasets and created scripts for easy-to-run experiments for comparison.	
<b>Seagate, Longmont, Colorado, Machine Learning Summer Intern</b>	<i>May 2020 - Aug 2020</i>
• Designed a graph-based, unsupervised abstractive multi-document text summarizer for a social listening app.	
• Implemented an unsupervised aspect-based sentiment analyzer for comparative online user reviews.	
<b>Lenovo, Morrisville, NC, Computer Science Summer Intern</b>	<i>May 2018 - Aug 2018</i>
• Automated test plan generation by extracting executable commands from test specification documents.	
• Reduced test suite execution time by leveraging recent results to skip low-impact tests that are likely to pass.	
<b>Oracle, Bangalore, India, Member of Technical Staff</b>	<i>July 2015 - June 2017</i>
• Designed and developed Service Deployment Infrastructure (SDI) modules for Oracle Public Cloud (OPC).	
• Implemented modules for a data center-level load balancer and a loosely coupled execution mode to reduce runtime and increase parallelism in execution.	

## CURRENT RESEARCH PROJECTS

- **Aligning Large Language Models (LLMs) Through Structured Pruning**  
Designed a pruning strategy using integrated gradients to isolate and remove biased neurons and layers in LLMs, effectively reducing social biases without sacrificing performance. Our approach can be adapted to tailor models for downstream tasks by excluding components that contribute to suboptimal performance.
- **Unveil Human Value Alignment in Software Artifacts Via Large Language Models (LLMs)**  
Leveraged LLMs to infer human value alignment from software artifacts using Schwartz’s value taxonomy. Identified challenges in capturing implicit values and introduced an interactive evaluation framework to improve accuracy. Our approach can be adapted in the software development lifecycle for early intervention to ensure software alignment.
- **Pitfalls in Large Language Model (LLM) Alignment Evaluation Benchmarks**  
Analyzed common LLM benchmarks for social biases, morality, and value alignment using measurement modeling. Mapped the relationship between latent and observed variables to expose limitations in current evaluation methods, providing insights to improve benchmark reliability and fairness.

- **Toward Interpretable Word Embeddings via Vector Subspace Projection**

Developed a scalable approach to uncover interpretable vector subspaces using semantic word pairs derived from lexicons. Applied sentiment and morality subspaces to analyze conflict news, enabling a comparative study of war versus peace journalism.

- **MultiDocument Text Summarization: Toward Incorporating Diverse Perspectives From Conflicting Documents**

Developing an evaluation framework for multi-document abstractive text summarization of conflicting perspectives. We create a dataset using LLMs through prompting, enabling the training of a multi-agent LLM-based simulation to synthesize diverse perspectives into a cohesive text summary.

## PUBLICATIONS

- **Amanul Haque**, and Munindar P. Singh. "Extracting Norms from Contracts Via ChatGPT: Opportunities and Challenges," in COINE, AAMAS, 2024, <https://doi.org/10.48550/arXiv.2404.02269>
- **Amanul Haque** and Munindar P. Singh, "NewsSlant: Analyzing Political News and Its Influence Through a Moral Lens," in IEEE Transactions on Computational Social Systems, 2024, <https://doi.org/10.1109/TCSS.2023.3341910>.
- **Amanul Haque**, Nirav Ajmeri, & Munindar P. Singh, *Understanding Dynamics of Polarization via Multiagent Social Simulation*. AI & Society, 38, 1373–1389 (2023). <https://doi.org/10.1007/s00146-022-01626-5>.
- **Amanul Haque**, Vaibhav Garg, Hui Guo, and Munindar Singh, *Pixie: Preference in Implicit and Explicit Comparisons*. In Proceedings of the 60th Annual Meeting of the Association for Computational Linguistics (Volume 2: Short Papers), pages 106–112, Dublin, Ireland, 2022. ACL, <http://dx.doi.org/10.18653/v1/2022.acl-short.13>
- F. B. Oliveira, **A. Haque**, D. Mougouei, S. Evans, J. S. Sichman and M. P. Singh, *Investigating the Emotional Response to COVID-19 News on Twitter: A Topic Modeling and Emotion Classification Approach*, in IEEE Access, vol. 10, pp. 16883-16897, 2022, <https://doi.org/10.1109/ACCESS.2022.3150329>.
- Francisco Bráulio Oliveira, Davoud Mougouei, **Amanul Haque**, Jaime Simão Sichman, Hoa Khanh Dam, Simon Evans, Aditya Ghose, Munindar P. Singh, *Beyond Fear and Anger: A Global Analysis of Emotional Response to Covid-19 News on Twitter*, Online Social Networks and Media, Volume 36, 2023, 100253, ISSN 2468-6964, <https://doi.org/10.1016/j.osnem.2023.100253>.
- Simon L. Evans, Rosalind Jones, Erkan Alkan, Jaime Simão Sichman, **Amanul Haque**, Francisco Bráulio Silva de Oliveira, Davoud Mougouei, *The Emotional Impact of COVID-19 News Reporting: A Longitudinal Study Using Natural Language Processing*, Human Behavior and Emerging Technologies, vol. 2023, Article ID 7283166, 16 pages, 2023. <https://doi.org/10.1155/2023/7283166>.

## TEACHING EXPERIENCE

- CSC 791 Natural Language Processing (assisted Dr. Munindar P. Singh) Fall 2020
- CSC 505 Design and Analysis of Algorithms (assisted Dr. Jamie Jennings) Spring 2020
- CSC 555 Social Computing and Decentralized AI (assisted Dr. Munindar P. Singh) Fall 2019

## COMMUNITY & LEADERSHIP SERVICES

### Conference Paper Reviewing

- ACL, ACM-TIST, AAMAS, and IEEE Access

### President and Head of Events

March 2022 - Sept 2023

- Maitri, Indian Graduate Student Association (IGSA), NC State University

[www.maitrincsu.org](http://www.maitrincsu.org)

### Organizer & Host

Aug 2022 - Dec 2022

- AI in Society Seminar Series at NC State University (talks available on [NCSU AI in Society](https://www.youtube.com/channel/UCNCSUAIinSociety) YouTube Channel)

### Graduate Mentoring

- Rahil Sarvaiya (Graduated with a Master in Computer Science in Fall 2022)
- Mansi Saxena (PhD student in the Computer Science Department at NCSU, 2023-present)