AMANUL HAQUE

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EDUCATION

Doctor of Philosophy (PhD) in Computer Science — *GPA - **4.0/4*** — *Expected Sept 2024*
North Carolina State University, Raleigh, NC
With a focus on Artificial Intelligence, Machine Learning, and Natural Language Processing

Master of Science in Computer Science — *CGPA - **4.0/4*** — *May 2019*
North Carolina State University, Raleigh, NC

Bachelor of Engineering in Information Science — *CGPA - **8.76/10*** — *May 2015*
PES University, Bangalore, India

AWARDS AND HONORS

- Computer Science Graduate Student Leadership Award 2023 — *Awarded by NC State University*
- Computer Science Outstanding Graduate TA Award 2021 — *Awarded by NC State University*

CURRENT RESEARCH PROJECTS

- ***Unveil Human Value Alignment in Software Artifacts Via Large Language Models (LLMs)***
  Identifying human value alignment in software artifacts using LLMs like ChatGPT. We use Schwartz's basic human values and identify value alignment in issue discussions between users and developers. Our framework can aid in aligning software with desired values by identifying misalignments early in the development lifecycle.

- ***Toward Interpretable Word Embeddings via Vector Subspace Projection***
  Leveraging antonyms to create more interpretable vector subspaces. We find that pairs identified based on semantic similarity in vector space perform better than manually paired words, providing a scalable methodology with reduced human intervention. Our initial experiments focus on sentiment and morality vector subspaces.

- ***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.

- ***Identifying Pitfalls in Existing Large Language Model (LLM) Alignment Evaluation Methodologies***
  Identifying pitfalls in LLM evaluation concerning social biases, stereotypes, morality, and values. We employ measurement modeling to delineate the evaluation and validation process, assessing the relationship between latent and observed variables in popular benchmarks and highlighting their limitations.

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.

PROFESSIONAL EXPERIENCE

Laboratory of Analytical Science (LAS), Graduate Summer Fellowship at SCADs ***June 2024 - Present***

- Designing and implementing an LLM agent-based multiagent system to synthesize diverse perspectives in abstractive text summarization.
- Designing evaluation framework for multi-document text summarization of conflicting perspectives.
- Designing evaluation to detect social and political bias in abstractive text summaries.

Coupang, Mountain View, California, Machine Learning Summer Intern ***May 2022 - Aug 2022***

- Improved Coupang's Deep & Cross Network (DCN) model's performance via feature engineering and parameter tuning and reduced features being used. The model recommends products to users based on past search history.
- Benchmarked the DCN model and created scripts for easy-to-run experiments on public datasets for comparison.

Seagate, Longmont, Colorado, Machine Learning Summer Intern ***May 2020 - Aug 2020***

- Designed a graph-based unsupervised abstractive multi-document text summarizer for a social listening tool to identify trending online topics and summarize related documents.
- Implemented an unsupervised aspect-based sentiment analyzer for online user reviews.

Lenovo, Morrisville, NC, Computer Science Summer Intern ***May 2018 - Aug 2018***

- Automated test plan generation based on requirement document specifications and historical test results to reduce test suite execution time.
- Designed an information extraction model to identify executable commands from unstructured text in RMK.

Oracle, Bangalore, India, Member of Technical Staff ***July 2015 - June 2017***

- Designed and developed Service Deployment Infrastructure (SDI) modules that govern the provisioning flow for all Oracle Public Cloud (OPC) subscription life cycles.
- Implemented modules for a data center level load balancer and a loosely coupled execution mode to reduce runtime and increase parallelism in execution.

TEACHING EXPERIENCE

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

COMMUNITY & LEADERSHIP SERVICES

Conference Reviewing ***Aug 2022 - Present***

- 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

Organizer & Host ***Aug 2022 - Dec 2022***

- *AI in Society Seminar Series at NC State University* (talks available on *NCSU AI in Society* 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)