

RESEARCH INTERESTS

Social Computing, Human-Centered Computing, NLP, Fairness, Explainability

EDUCATION

- **George Mason University** Virginia, United States
Doctor of Philosophy, Computer Science Aug. 2022 – Present
- **Delhi Technological University** Delhi, India
Master of Technology, Information Systems (Research Track) Aug. 2019 – Aug. 2021
Thesis: Deep Neural Networks towards Multimodal Information Credibility Assessment
- **Indira Gandhi Delhi Technical University for Women** Delhi, India
Bachelor of Technology, Computer Science and Engineering Aug. 2015 – May 2019

EXPERIENCE

- **University of Technology Sydney** Sydney, Australia
Visiting Scholar Jun. 2021 - Jul. 2022
 - Designed and implemented neural network models for detecting web information pollution such as cyberbullying, hate speech, and offensive speech in multimodal data.
 - Performed over 150 machine-learning experiments and conducted a comprehensive review of the state-of-the-art literature on vertigo diagnosis to determine crucial medical tests for efficient diagnosis of spontaneous vertigo.
 - Contributed to the development of a diversity-inclusive curriculum for Australian Aboriginal communities, incorporating AI and ML technologies through a review of relevant scientific literature.
 - Analyzed users' perceptions towards multimedia posts in collaboration with the Australian Red Cross Society, investigating the relationship between disaster relief fundraising and social media KPIs by examining key hypotheses.
 - Conducted exploratory data analysis and sentiment analysis on Red Cross donation data during the Australian bushfire period, studying the impact of social media activity on donation behavior, and identifying practical implications for promoting responsible fundraising practices among social media users.
- **Delhi Technological University** Delhi, India
Graduate Researcher Aug. 2019 - Jul. 2022
 - Designed & implemented frameworks for detecting antisocial content online, utilizing deep neural networks & a range of machine learning algorithms, including supervised, semi-supervised, & unsupervised methods, for identifying fake news, rumors, misinformation, disinformation, infodemic, death hoaxes, fake videos & clickbait.
 - Acquired real-world datasets for misinformation analysis, including the COReNA Virus Infodemic Dataset, the Fake News Video Dataset, and a questionnaire-based survey for evaluating the impact of infodemic.
- **Indian Institute of Management Raipur** Chhattisgarh, India
Remote Researcher May 2021 - Aug. 2021
 - Utilized neural networks for predicting stock market and cryptocurrency prices, conducted analysis of financial market behavior, and evaluated the causal relationship between market trends and societal events.
 - Improved the accuracy of real-time multivariate time-series predictions for Bitcoin returns by optimizing the Taylor series approximation and copula methods.
 - Proposed a novel Long Short-Term Memory (LSTM) autoencoder model with False Nearest Neighbor regularization, capable of identifying social determinants contributing to fluctuations in Bitcoin prices.
- **Centre for Railway Information Systems (CRIS)** Delhi, India
Information Security Intern May 2018 - Aug. 2018
 - Conducted security management and threat detection for Northern-Indian railways, including organizational defense, detection of malicious activities, analysis of logs, assessment of vulnerabilities, and generation of patches, using Cisco's Security Information and Event Management (SIEM) system.
- **Indira Gandhi Delhi Technical University for Women** Delhi, India
Research Intern Aug. 2017 - Dec. 2017
 - Discovered previously unknown (zero-day) vulnerabilities on popular social networking applications such as Facebook, Instagram, and Telegram.

PUBLICATIONS

- **Chahat Raj** and Priyanka Meel. “People Lie, Actions Don’t! Modeling Infodemic Proliferation Predictors among Social Media Users.” *Technology in Society* 2022, 68, 101930. (Impact Factor: **7.82**)
- **Chahat Raj** and Priyanka Meel. “ARCNN Framework for Multimodal Infodemic Detection.” *Neural Networks* 2021, 146, 36-68. (Impact Factor: **9.657**)
- **Chahat Raj** and Priyanka Meel. “ConvNet Frameworks for Multimodal Fake News Detection.” *Applied Intelligence* 2021, 1-17. (Impact Factor: **5.086**)
- **Chahat Raj** and Priyanka Meel. “Microblogs Deception Detection using BERT and Multiscale CNNs.” *IEEE GCAT* 2021
- **Chahat Raj** and Priyanka Meel. “Is Dynamic Rumor Detection on Social Media Viable? An Unsupervised Perspective.” 2021. *Arxiv*
- **Chahat Raj** and Mihir P Mehta. “MediaEval 2020: An Ensemble-based Multimodal Approach for Coronavirus and 5G Conspiracy Tweet Detection.” *MediaEval, CEUR Workshop Proceedings* 2020
- **Chahat Raj** and Priyanka Meel. “Fake News on Multiple Online Social Networks.” *ICPCCAI* 2020, 1-8.
- **Chahat Raj**, Ayush Agarwal, Gnana Bharathy, Bhuva Narayan and Mukesh Prasad. “Cyberbullying Detection: Hybrid Models Based on Machine Learning and Natural Language Processing Techniques.” *Electronics* 2021, 10(22), 2810. (Impact Factor: **2.397**)
- Vivek Velivela, **Chahat Raj**, Mahendra Samarawickrama and Mukesh Prasad. “The Effectiveness of Social Media Engagement Strategy on Disaster Fundraising.” 2022. (ISCRAM 2022)
- Varad Kabade, Ritika Hooda, **Chahat Raj**, Zainab Awan, Allison Young, Miriam Welgampola and Mukesh Prasad. “Machine Learning Techniques for Differential Diagnosis of Vertigo and Dizziness: A Review.” *Sensors* 2021, 21(22), 7565. (Impact Factor: **3.576**)
- Chao Wang, Allison Young, **Chahat Raj**, Andrew Bradshaw, Sally Rosengren, Zeljka Calic, Gnana Bharathy and Mukesh Prasad. “Diagnosis of Recurrent Spontaneous Vertigo using Machine Learning Techniques.” 2022. (Under Review)
- Yohei Nii, **Chahat Raj**, Muhammad Salman Tiwana, Mahendra Samarawickrama and Mukesh Prasad. “Understanding Social Media Engagement in Response to Disaster Fundraising Attempts during Australian Bushfires.” *ICIVC* 2022

TEACHING EXPERIENCE

- **Graduate Teaching Assistant** GMU, Virginia
CS112 Introduction to Python Programming Aug. 2022 – Present
- **Graduate Teaching Assistant** DTU, Delhi
ISY5301 Artificial Intelligence Aug. 2019 – May 2021
- **Professional Tutor** Delhi
Tutored 300+ high school students Apr. 2015 – Mar. 2022

PROFESSIONAL SERVICE

- **Reviewer**
Social Network Analysis and Mining (Springer), CGRN (UIUC), IJICC, JCMS, ASTES, Arts in Society

AWARDS AND ACHIEVEMENTS

- **Summer Graduate Research Award 2023:** Research Topic - *Explainability and Robustness of Debiasing Approaches for Transformers*, Awarded by: *George Mason University*
- **Research Excellence Award 2023:** Received *Commendable Research Award* and a cash prize of INR 50,000 by DTU, Delhi, for the research published in *Neural Networks*
- **Research Excellence Award 2023:** Received *Commendable Research Award* and a cash prize of INR 50,000 by DTU, Delhi, for the research published in *Technology in Society*
- **Research Excellence Award 2022:** Received *Commendable Research Award* and a cash prize of INR 50,000 by DTU, Delhi, for the research published in *Applied Intelligence*
- **Graduate Scholarship:** Received government scholarship from *AICTE* of INR 2,97,600 during the academic years 2019-2021 for qualifying GATE exam

TALKS AND PRESENTATIONS

- **Cyberbully Monitoring:** ML4AU Research Showcase Event 2021, Sydney, Australia
- **Microblogs Deception Detection using BERT and Multiscale CNNs:** GCAT 2021, Bangalore, India
- **Cyber Security and Online Safety:** Motilal Nehru College, Delhi University, Delhi, India
- **Fake News: Coronavirus and 5G Conspiracy Task:** MediaEval 2020
- **Fake News on Multiple Online Social Networks:** ICPCCAI 2020, Jaipur, India

SELECTED PROJECTS [[GitHub](#)]

- **TruePixel:** Novel R-CNN to detect image forgery using RPN, ROI pooling, Bilinear pooling, RGB & Noise Roi layers
- **SimonSays:** A Novel LSTM-CNN framework for speaker identification on self-curated dataset of 1300 audios
- **ToonGAN:** Cartoon Face to Human Face Translation using Generative Adversarial Network with Semantic Loss
- **AI-Spy:** Collected an infodemic dataset of 200 videos to perform rule & frame-based visual fake news detection
- **EMO-280:** A deep CNN to perform fine-grained emotion classification on AarogyaSetu data by Transfer learning
- **FakeTalk:** Sentiment Analysis on Twitter Infodemic with TextBlob, Affin; Misinformation Topic Modeling with LDA
- **WhoAmI:** A residual network for image-based human reidentification for biometric devices on self curated data
- **Touristics:** Mined TripAdvisor data and analyzed customer preferences in tourism and hospitality during COVID-19
- **Vehicle Tracker:** Device to detect road-violation using Raspberry Pi, GPS, Accelerometer, Ultrasonic sensor, camera
- **CryptoResume:** Decentralized Blockchain to resist frauds, data leakage, support accreditation for resume validation
- **RecruitQuery:** A low-cost solution to GitHub recruiters built using front-end layer over GitHub API, Re, Pygments

RELEVANT COURSEWORK

Doctoral Coursework

- *Advanced NLP, Data Mining, Analysis of Algorithms, Research Experience in CS, Research in CS*

Graduate Coursework

- *Research in CS, Data Mining, Research Problem Formulation, Research Project (24-Credits), Artificial Intelligence, Machine Learning and Applications, Image Analysis, Linear Algebra and Probability, High Performance Computing*

Undergraduate Coursework

- *Natural Language Processing, Artificial Intelligence, Data Warehousing & Data Mining, Cloud Computing, Big Data Analytics, Theory of Computation*

SKILLS AND TECHNOLOGIES

- **Languages:** Python, R
- **Libraries:** TensorFlow, PyTorch, Keras, Sci-Kit Learn
- **Softwares:** Minitab, SPSS, NVivo, Tableau, PowerBi, Office
- **Certifications:** Neural Networks and Deep Learning [[Coursera](#)], Deep Learning Fundamentals [[IBM](#)], Deep Learning with Tensorflow [[IBM](#)], Accelerated Deep Learning with GPUs [[IBM](#)], Machine Learning with Python [[IBM](#)], Data Visualization with Python [[IBM](#)], Data Visualization with R [[IBM](#)]

NON-ACADEMIC INTERESTS

Poetry, Blog Writing, Travel, Photography, Football, Art