

Chahat Raj

ARTIFICIAL INTELLIGENCE RESEARCHER

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“Reading maketh a full man, conference a ready man and writing an exact man.” – Francis Bacon

Research Interests

SOCIAL COMPUTING · NEURAL NETWORKS · SOCIAL NETWORKS & MEDIA · MULTIMODALITY · EXPLAINABLE AI · AI FOR SOCIETY

Education

DELHI TECHNOLOGICAL UNIVERSITY, INDIA

CGPA: 8.78/10

MASTER OF TECHNOLOGY IN INFORMATION SYSTEMS

Aug 2019 - Aug 2021

INDIRA GANDHI DELHI TECHNICAL UNIVERSITY FOR WOMEN, INDIA

CGPA: 6.42/10

BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE AND ENGINEERING

Aug. 2015 - May 2019

MOUNT OLIVET SCHOOL, DELHI, INDIA

87.8% (SS), CGPA: 9.4/10 (S)

SENIOR SECONDARY & SECONDARY, CBSE

March 2015

Publications

- [1] **Raj, Chahat.** "Deep Neural Networks towards Multimodal Information Credibility Assessment." Master's Thesis (2021) [PDF]
- [2] **Raj, Chahat** and Priyanka Meel. "ARCNN Framework for Multimodal Infodemic Detection." Neural Networks 2021, 146, 36-68. [Published]
- [3] **Raj, Chahat** and Priyanka Meel. "ConvNet Frameworks for Multimodal Fake News Detection." Applied Intelligence 2021, 1-17. [Published]
- [4] **Raj, Chahat** and Priyanka Meel. "Microblogs Deception Detection using BERT and Multiscale CNNs." IEEE GCAT 2021 [Published]
- [5] **Raj, Chahat** and Priyanka Meel. "Is Dynamic Rumor Detection on Social Media Viable? An Unsupervised Perspective." 2021. [Arxiv Preprint]
- [6] **Raj, Chahat** and Priyanka Meel. "Fake News on Multiple Online Social Networks." ICPCCAI 2020, 1-8. [Published]
- [7] **Raj, Chahat** and Priyanka Meel. "People Lie, Actions Don't! Modeling Infodemic Proliferation Predictors among Social Media Users." 2021. [Arxiv Preprint]
- [8] **Raj, Chahat** and Priyanka Meel. "A Review of Web Infodemic Analysis and Detection Trends across Multi-modalities using Deep Neural Networks." 2021. [Under Review | PDF]
- [9] **Raj, Chahat**, 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. [Published]
- [10] Kabade, Varad, 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. [Published]
- [11] **Raj, Chahat** and Mihir P Mehta. "MediaEval 2020: An Ensemble-based Multimodal Approach for Coronavirus and 5G Conspiracy Tweet Detection." MediaEval, CEUR Workshop Proceedings 2020 [Published]
- [12] **Raj, Chahat** and Manojit Chattopadhyay. "Bitcoin Price Prediction using LSTM Autoencoder Regularized by False Nearest Neighbor Loss." 2021. [Under Review | PDF]
- [13] Velivela, Vivek, **Chahat Raj**, Mahendra Samarawickrama and Mukesh Prasad. "The Effectiveness of Social Media Engagement Strategy on Disaster Fundraising." 2021. [Under Review | PDF]

Experience

UNIVERSITY OF TECHNOLOGY SYDNEY

Sydney, Australia

VISITING SCHOLAR

June 2021 - Present

- Developing **novel deep architectures** for web information pollution (**cyberbullying, hate & offensive speech**) detection in **multimodalities**
- Reviewed state-of-the-art** in vertigo classification and performed **150+ ML experiments** determining critical medical tests for clinical inferences
- Employing **Explainable AI** in understanding ML performance in **liver cancer identification** using real-world patient data collected from hospitals

AUSTRALIAN RED CROSS

Australia

REMOTE RESEARCHER

July 2021 - Present

- Performed **EDA & Sentiment Analysis** on Red-Cross Donation data for the Bushfire period and identified **Facebook users' donation behavior**
- Formulated **key hypotheses** to establish the **relationship among social media KPIs and Disaster Fundraising**, also identifying users' perception
- Analyzed Facebook users' **patterns in watching, sharing, recommending, commenting, reacting to videos** for disaster relief fundraising

INDIAN INSTITUTE OF MANAGEMENT RAIPUR

Chhatisgarh, India

REMOTE RESEARCHER

May 2021 - Present

- Employing **Neural Networks** for **Stock Market & Cryptocurrencies' Price Prediction** & identifying **financial behaviour of markets & society**
- Optimizing **taylor series approximation** and **copula** for real-time **multivariate time-series predictions** of bitcoin returns
- Developed a novel **LSTM Autoencoder** with **False Nearest Neighbor Regularizer**, identifying two social deterministic factors for bitcoin prices

CENTRE FOR RAILWAY INFORMATION SYSTEMS (CRIS)

Delhi, India

INFORMATION SECURITY INTERN

May 2018 - Aug. 2018

- Performed organizational defense **malicious activity detection, log analysis, vulnerability assessment & patch generation** by Cisco's SIEM
- Fixed loopholes** in North-Indian Railways freight and passenger **ticket-booking dashboards**. Learned **CCNA**

INDIRA GANDHI DELHI TECHNICAL UNIVERSITY FOR WOMEN

Delhi, India

RESEARCH INTERN

Aug 2017 - Dec 2017

- Identified **zero-day vulnerabilities** on **Facebook, Instagram, & Telegram** that let malicious users hack into social accounts of people
- Developed a **phishing website** and implemented its **retraction mechanism** from scratch to **ensure online security** on social networking sites
- Responsible for managing **workstations' boot up** with Ubuntu, Kali Linux, & Windows and **network configuration** in Computer Networks lab

Teaching

ADVISOR	to D. Kharat, B Vinod, M. Ibrahim, P. Sisodia, R. Bansal, H. Jangid, R. Hooda	2020 - 2021
TEACHING ASSISTANT	Delhi Technological University, Graduate level, ISY5301 Artificial Intelligence	2019 - 2021
PROFESSIONAL TUTOR	Raj Tutorials, tutored 150+ high school students in their curriculum for 6+ years	2015 - 2021

Professional Services

REVIEWER	Common Ground Research Networks , The Journal of Communication and Media Studies, Arts in Society, ASTES Journal , International Journal of Intelligent Computing and Cybernetics , Emerald Publishing	2021 2021
HEAD	Cyber Cell , IGDTUW	2017-2019

Talks and Presentations

TALK	Cyberbully Monitoring: ML4AU Research Showcase Event, Sydney, Australia [URL]	2021
TALK	Cyber Security and Online Safety: Motilal Nehru College, Delhi University, Delhi, India	2018
PRESENTATION	Microblogs Deception Detection using BERT and Multiscale CNNs: GCAT, Bangalore, India	2021
PRESENTATION	Fake News: Coronavirus and 5G Conspiracy Task: MediaEval [URL]	2020
PRESENTATION	Fake News on Multiple Online Social Networks: , ICPCCAI, Jaipur, India	2020

Selected Projects

TRUEPIXEL	Novel R-CNN to detect image forgery using RPN, ROI pooling, Bilinear pooling, RGB & Noise Roi layers	CODE
SIMONSAYS	A Novel LSTM-CNN with 98% accuracy for speaker identification on self-curated dataset of 1300 audios	CODE
TOON-GAN	Cartoon Face to Human Face Translation using Generative Adversarial Network with Semantic Loss	CODE
AI-SPY	Collected an infodemic dataset of 200 videos to perform rule & frame-based visual fake news detection	CODE
EMO-280	A deep CNN to perform fine-grained emotion classification on AarogyaSetu data by transfer learning	CODE
FAKETALK	Sentiment Analysis on Twitter Infodemic using TextBlob, Affin; Misinformation Topic Modeling using LDA	CODE
WHOAMI	A residual network for image-based human reidentification for biometric devices on self curated data	CODE
TOURISTICS	Mined TripAdvisor data and analyzed customer preferences in tourism and hospitality during COVID-19	CODE
VEHICLE TRACKER	A device using Raspberry Pi, GPS, Accelerometer, Ultrasonic sensor & camera to detect road-violation	CODE
CRYPTORESUME	Decentralized Blockchain to resist frauds, data leakage & supporting accreditation for resume validation	CODE
RECRUITQUERY	A low-cost solution to GitHub recruiters built using front-end layer over GitHub API , Re, Regex, Pygments	CODE

Technologies

LANGUAGES	Python, R, MATLAB, Simulink, C, C++, HTML, LATEX
LIBRARIES	TensorFlow, PyTorch, Keras, Scikitlearn, Pandas, NumPy, Matplotlib
SOFTWARES	Minitab, SPSS, NVivo, Tableau, PowerBi, MS 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]

Achievements

SCHOLARSHIP	Received government scholarship from AICTE for qualifying GATE entrance exam	2019-2021
FIRST RANK	AIR 1 , B.El.Ed., DELHI UNIVERSITY, National level entrance exam	2015
FIFTH RANK	Certified Ethical Hacking , CYBER SECURITY CELL, IGDTUW, scored 75/79	2017
THIRD RANK	MEDIAEVAL 2020 Coarse Classification Subtask for Coronavirus and 5G Conspiracy detection	2020

Extracurricular Activity

WRITER, POET	Authored over 50 blogs, 200 narratives & poetries in English, Hindi & Urdu	Website
FOUNDER	Upsilon Labs , an initiative to support collaborations for interdisciplinary research in AI	
COORDINATOR	Taarangana : The annual fest, IGDTUW	