Chahat Raj

ARTIFICIAL INTELLIGENCE RESEARCHER

(+91) 7982616059 | chahat.raj@uts.edu.au | chahatraj.github.io | chahatraj | chahatraj

"Reading maketh a full man, conference a ready man and writing an exact man."

Research Interests

DEEP LEARNING   SOCIAL COMPUTING · ONLINE MEDIA · MULTIMODALITY · EXPLAINABLE AI · AI FOR SOCIETY · STATISTICAL INFERENCE

Education

DELHI TECHNOLOGICAL UNIVERSITY, INDIA   *CGPA: 9.08/10*
MASTER OF TECHNOLOGY IN **INFORMATION SYSTEMS**   *Aug. 2019 - May 2021*
Research Track   Thesis: Deep Neural Networks towards Multimodal Information Credibility Assessment

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   *CGPA: 9.2/10, 9.4/10*
SENIOR SECONDARY & SECONDARY, CBSE   *March 2015*

Experience

UNIVERSITY OF TECHNOLOGY SYDNEY   *Sydney, Australia*
RESEARCH ASSOCIATE,   VISITING SCHOLAR   *June 2021 - Present*
- Researching and developing AI methods for web information pollution (**cyberbullying, hate and offensive speech**) detection.
- Collaborating with **Australian Red Cross** in identifying social media dependencies on **Australian Bushfires'** Donation.
- Researching AI mechanisms in **healthcare** to identify medical ailments: **vertigo, liver cancer, alzheimer's, chest X-ray and plant diseases**.

INDIAN INSTITUTE OF MANAGEMENT RAIPUR   *Chhatisgarh, India*
REMOTE RESEARCHER   *May 2021 - Present*
- Using Deep Learning for **Stock Market and Cryptocurrencies'** Price Prediction and performing **financial behaviour analysis**.
- Employing **taylor series approximation** and **copula** for **multivariate time-series predictions** of bitcoin returns.
- Developed a novel **LSTM Autoencoder** with **False Nearest Neighbor Regularizer**, identifying 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.

Teaching

GRADUATE TEACHING ASSISTANT   Delhi Technological University, ISY5301 **Artificial Intelligence**.   *2019 - 2021*
PROFESSIONAL TUTOR   Raj Tutorials, **tutored** high school students in their curriculum for **6+ years**.   *2015 - 2021*

Publications

[1]   **Raj, Chahat**, and Priyanka Meel. "*ConvNet frameworks for multi-modal fake news detection.*" Applied Intelligence (2021): 1-17. [Published]

[2]   **Raj, Chahat** and Mihir P. Mehta. "*MediaEval 2020: An Ensemble-based Multimodal Approach for Coronavirus and 5G Conspiracy Tweet Detection.*" MediaEval 2020, CEUR Workshop Proceedings (2020) [Published]

[3]   **Raj, Chahat** and Priyanka Meel. "*Fake News on Multiple Online Social Networks.*" ICPCCAI (2020): 1-8. [Published]

[4]   **Raj, Chahat** and Priyanka Meel. "*Microblogs Deception Detection using BERT and Multiscale CNNs.*" IEEE GCAT (2021) [Accepted]

[5]   **Raj, Chahat** and Priyanka Meel. "*ARCNN Framework for Multimodal Infodemic Detection.*" Neural Networks (2021) [Revised]

[6]   Kabade, Varad, Ritika Hooda, **Chahat Raj**, Zainab Awan, Allison Young, Miriam Welgampola and Mukesh Prasad. "*A Review of Machine Learning Techniques for Acute Vertigo/Dizziness.*" Sensors (2021) [Communicated & Revised]

[7]   **Raj, Chahat** and Priyanka Meel. "*People Lie, Actions Don't! Modeling Infodemic Proliferation Predictors among Social Media Users.*" Technology in Society (2021) [Under Review]

[8]   **Raj, Chahat** and Priyanka Meel. "*A Review of Web Infodemic Analysis and Detection Trends across Multi-modalities using Deep Neural Networks.*" Neurocomputing (2021) [Under Review]

[9]   **Raj, Chahat** and Manojit Chattopadhyay. "*Bitcoin Price Prediction using LSTM Autoencoder and False Nearest Neighbor Loss.*" Finance Research Letters (2021) [Under Review]

[10]   **Raj, Chahat**, Ayush Agarwal, Gnana Bharathy, Bhuva Narayan and Mukesh Prasad. "*Cyberbullying Detection: Hybrid Models based on Machine Learning and Natural Language Processing Techniques.*" ACM Transactions on the Web (2021) [Under Review]

Positions of Responsibility

TALK	Represented University of Technology Sydney, Australia at **ML4AU research** showcase event	*2021*
REVIEWER	The Journal of Communication and Media Studies; Common Ground Research Networks, UIUC	*2021*
REVIEWER	International Journal of Intelligent Computing and Cybernetics; Emerald Publishing	*2021*
REVIEWER	Advances in Science, Technology and Engineering Systems Journal	*2021*
RESEARCH MENTOR	to **Master's** and **Bachelor's** students at IIT Delhi and DTU in Artificial Intelligence	*2020-2021*
HEAD COORDINATOR	Cyber Cell, IGDTUW	*2017-2019*

Projects

UNSUPERVISED RUMOR DETECTION   *Delhi, India*

SUPERVISOR: **DR. PRIYANKA MEEL**   *Ongoing*

- Developing a novel machine learning architecture using clustering algorithms (**RBF Kernel**, **NN**, **K-Means**, **Fuzzy C Means** Clustering) to classify tweets in **PHEME** dataset into multiple categories.

MULTIMODAL FAKE NEWS DETECTION USING TEXT-CNN AND ALEXNET   *Delhi, India*

SUPERVISOR: **DR. PRIYANKA MEEL**   *Spring 2020*

- Designed and implemented a novel architecture for detecting fake news using textual and visual features with **Text-CNN**, **AlexNet**, and **Attention-Mechanism**. The model's performance surpasses existing state-of-the-art-methods.

IMAGE FORGERY DETECTION   *Delhi, India*

SUPERVISOR: **MS. DEEPIKA VARSHNEY**   *Fall 2019*

- Developed a deep learning model introducing a **novel R-CNN architecture** to detect manipulated regions in images. The approach proposes a faster R-CNN composing **RPN layer**, **ROI pooling layer**, **Bilinear pooling layer**, **RGB Roi and Noise Roi feature layers** and training it end-to-end.

Other Projects   **Emotion Analysis by Transfer Learning, Infodemic Sentiment Analysis & Topic Modeling, Fake Video Detection, CryptoResume, RecruitQuery, VehicleTracker**

Technologies

LANGUAGES	Python (Good); R, MATLAB, Simulink, C, C++, HTML (Familiar)
SOFTWARES	Minitab, SPSS, NVivo, Tableau
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]

Key Courses

Research Project, Research Problem Formulation, Research Seminar, Artificial Intelligence	*10 Grade Point*
Machine Learning and Applications	*9 Grade Point*

Achievements

BATCH TOPPER	Scored **10.00 SGPA** in M.Tech. third semester at DTU	*2020-2021*
SCHOLARSHIP	Received government scholarship from AICTE for qualifying GATE entrance exam	*2019-2021*
THIRD RANK	MEDIAEVAL 2020 Coarse Classification Subtask	*2020*
FIFTH RANK	Certified Ethical Hacking, CYBER SECURITY CELL, IGDTUW, **scored 75/79**	*2017*
FIRST RANK	DELHI UNIVERSITY, National level entrance exam	*2015*

Extracurricular Activity

AMATEUR WRITER, POET	Authored over **50 blogs**, **200 narratives** & **poetries** in English, Hindi & Urdu.	*Website*

Manuscripts under Preparation

[1] **Raj, Chahat** and Priyanka Meel. ***"Unsupervised Approach for Early Detection of Twitter Rumors."***

[2] **Raj, Chahat** and Priyanka Meel. ***"Perception Mining and Behavioral Analysis of Social Media Users towards Web Information Pollution."***

[3] **Raj, Chahat** and Manojit Chattopadhyay. ***"Taylor Approximation combined Deep Learning for Predicting Bitcoin Returns."***

[4] **Raj, Chahat**, Yohei Li, Mahendra Samarawickrama and Mukesh Prasad. ***"Establishing Social Media Engagement Factors effecting Disaster Fundraising during Australian Bushfires."***

[5] **Raj, Chahat**, Chao Wang, Allison Young, Miriam Welgampola and Mukesh Prasad. ***"Critical Clinical Tests Determination for Vertigo Detection using Machine Learning Classifiers."***