

Rachit Bansal

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RESEARCH INTERESTS

Computational Linguistics, Neural Machine Translation, Unsupervised and Semi-Supervised Learning, Representation Learning, Bayesian Machine Learning, Graphical Models

TECHNICAL SKILLS

Languages: Python, C++, C, JavaScript, HTML/CSS, Unix Shell Scripting
Frameworks: PyTorch, Tensorflow, HuggingFace, FairSeq, Flask, Node.js
Miscellaneous: Selenium, Seaborn, Material Design, Bootstrap, jQuery, MongoDB

EDUCATION

Delhi Technological University New Delhi, India
Bachelor of Technology (**B.Tech**) in Electrical Engineering July 2022 (expected)
CPI: 8.42/10

Bal Bharati Public School New Delhi, India
CBSE Class XII July 2018
Percentage Score: 91.5% agg.

Bal Bharati Public School New Delhi, India
CBSE Class X July 2016
CGPA: 10/10

RESEARCH EXPERIENCE

Laboratory for Computational Social Systems (LCS2) IIIT Delhi, New Delhi, India
Undergraduate Student Researcher May 2020 – Present

- **Advisor:** [Dr. Tanmoy Chakraborty](#)
- **Project:** Retrieving and Detecting closed-domain misinformation across social media networks.
- Extracted more than 45M domain specific Tweets and labelled a part of them by modelling it as an NLI task between known facts and the query text, used BERT Sentence Embeddings and RoBERTa fine-tuned on the SNLI Corpus.
- Introduced Cross-SEAN, an end-to-end explainable neural model for SOTA misinformation detection in a closed-domain.

Cuneiform Digital Library Initiative (CDLI) University of Oxford, UK
Research Intern and Open-Source Contributor June 2020 – Present

- **Advisors:** [Dr. Jacob Dahl](#) and [Niko Schenk](#)
- **Project:** Implementing Semi-Supervised and Unsupervised techniques for Low-Resource Neural Machine Translation of Sumerian, the first written language used by mankind, to English.
- Experimented with a wide range of techniques under the three broad categories of Data Augmentation (Back Translation and Dual Learning), Transfer Learning (pre-trained NMT models for Spanish and French) and Auto-regressive Pre-training (XLM and MASS). Achieved SOTA results for Sumerian-English Translation.
- Worked as a part of the MTAAC team to curate an end-to-end interpretable translation pipeline for Sumerian by integrating NER and POS Tagging models with the Semi-Supervised models.

Samsung Research Lab DTU, New Delhi, India
Undergraduate Student Researcher October 2019 – May 2020

- **Advisor:** [Dr. Divyashikha Sethia](#)
- **Project:** Curating a Gaze Detection based mobile framework to analyse the sustained attention of a user by localising their gaze on the given mobile device.
- Worked on the Image Processing module to define metric scores for a person's attention using relative positioning of the target points and the pupil gaze.
- Worked in collaboration with Samsung R&D Lab, Noida, for deployment of the model on an Android Application and tested it to measure the focus level and attention span of patients.

PUBLICATIONS

- W. Scott, **R. Bansal**, A. Kaushik, T. Chakraborty
Cross-SEAN: A Cross-Stitch Semi-Supervised Neural Attention Model for COVID-19 Fake News Detection (under review at COLING'20)

TEACHING

Coding Blocks

Student Instructor

New Delhi, India

March 2020 - May 2020

- **Course:** Reinforcement Learning (Online)
- Recorded 10-hours worth of lectures and a number of live webinars. Collaborated with course mentors to build project ideas, assignments and quizzes for the 12 modules of the course.

Coding Blocks

Teaching Assistant

New Delhi, India

June 2019 - August 2019

- **Course:** Machine Learning with Deep Learning
- Conducted classes and doubt sessions for a batch of 65 senior undergraduate students from all across the country throughout the summer. Built course quizzes and interactive projects in collaboration with other Teaching Assistants for the online portal of the course.

ACADEMIC PROJECTS

Chrome-SEAN: A Browser Extension to Detect Fake News

- Curated an easy to use chrome extension based on our research work of detecting misinformation, Cross-SEAN, to predict the possibility of a tweet status being fake with an accuracy of 95.4%.
- Integrated the functionality of Online Learning by taking real-time user feedback on the prediction and using it intelligently to improve model's performance.

Power Forecasting using User Behaviour Learning¹

- Experimented across models like Vanilla LSTMs, CNN-LSTMs, ARIMA, AR-Net and an Ensemble with XG-Boost, in order to forecast power and efficient energy utilisation in a household.
- Worked under the supervision of [Dr. Kapil Sharma](#) to integrate parallel functionalities including GHI Prediction, Appliance Scheduling, and Smart Plugs.

FEATURED COURSEWORK

- MIT RES-6-012, Introduction to Probability, MIT OCW ([Online](#))
- MIT 18-065, Matrix Methods in Signal Processing, and Machine Learning, MIT OCW ([Online](#))
- Probabilistic Graphical Models, Stanford University ([Online](#))
- Bayesian Methods for Machine Learning, National Research University, Russia ([Online](#))
- Machine Learning with Deep Learning, Coding Blocks ([Online](#))
- Numerical and Engineering Optimization Methods, DTU (B.Tech, 3rd Semester)

AWARDS & HONOURS

- **Winner at HackData, IGDTUW, 2019**
Held the 3rd Position at the Nationwide Data Science Hackathon. Made an OCR system for medical prescriptions using CNN-Bi-LSTMs to auto-set health records and reminders in an allied application.
- **Codepreneur Scholar, GirlsScript, 2019**
Chosen as one of the 30 scholars from all across India for a Residential Scholarship Program.
- **Proficiency Award, 2016**
For consistent academic excellence and perfect scores in Classes IX and X.
- **Literary Prodigy Award, 2015**
A special accolade awarded by The Young Poets Network, UK, for my endeavours in the field of English Literature.²

RELEVANT SERVICE & POSITIONS

- **Volunteer**, Association for Computational Linguistics (ACL), 2020
- **Volunteer**, International Conference on Machine Learning (ICML), 2020
- **Co-Founder**, Code to School, An initiative to collaborate with schools across the country and teach high school students various programming languages and computer science skills.
- **Mentor**, Tensorflow, Google Code-In
- **ML Lead**, Google Developer Student Club, DTU Chapter
- **Content Head**, Sahitya, the Literary and Debating Society of DTU

¹[RachitBansal/Power-Forecasting](#)

²Check out some of my [poetry](#)