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: 8.62/10

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 explainable neural model for closed-domain misinformation detection.

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

- **Advisors:** Dr. Jacob Dahl and Dr. Niko Schenk
- **Project:** Neural Machine Translation of Extremely Low-Resource Cuneiform Languages.
- Curated, implemented and adapted techniques for Sumerian-English Translation under the three broad categories of Data Augmentation, Knowledge Transfer and Self-supervised Pre-training. Used gradient and perturbation-based methods to interpret the results across these learning paradigms.
- 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:** Using Gaze Localisation to Study Sustained Attention on a Mobile Device.
- Experimented across various methodologies to curate an image processing module for analyzing a person's attention using relative positioning of the target and gaze points.
- Worked in collaboration with Samsung R&D Lab, Noida, for deployment of the model on an Android Application and tested it to measure sustained attention of the subjects.

PUBLICATIONS

- **R. Bansal**, H. Choudhary, R. Punia, N. Schenk, J. Dahl, É Pagé-Perron
  How Low is Too Low? A Computational Perspective on Extremely Low-Resource Languages
  (under review)
- 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)

TEACHING

Coding Blocks New Delhi, India

Student Instructor- Reinforcement Learning (Online) March 2020 - May 2020

- 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.

Teaching Assistant- Machine Learning with Deep Learning June 2019 - August 2019

- 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 conditionally to improve model's performance.

Power Forecasting using User Behaviour Learning[1]

- 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.
- **Academic Proficiency Award**, 2016
- **Literary Prodigy Award**, 2015
  Awarded by The Young Poets Network, UK, for my endeavours in the field of English Literature.[2]

RELEVANT SERVICE & POSITIONS

- **Volunteer**, Association for Computional Lingustics (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
- **Joint Secretary**, Sahitya, the Literary and Debating Society of DTU

[1] RachitBansal/Power-Forecasting
[2] Check out some of my **poetry**