

# Rachit Bansal

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## EDUCATION

**Delhi Technological University**  
B.Tech. in Electrical Engineering

New Delhi, India  
2022 (expected)

## EXPERIENCE

**Technion - Israel Institute of Technology**

*Research Intern* (Advisor: [Dr. Yonatan Belinkov](#))

Sept 2021–Present

Investigating information-theoretic measures to localize generalization.

- Working on developing measures that capture the distribution of information across model sub-networks.
- Experimented for properties such as out-of-domain generalization, label memorization, and robustness to distribution shifts; observed that the information measures directly explain model behaviour.

**Adobe, Media and Data Science Research (MDSR)**

*Research Intern* (Host: [Balaji Krishnamurthy](#))

Jan 2021–Sept 2021

Towards making language models factual and commonsense reasoning aware.

- Developed a mechanism of mapping paths from structured knowledge graphs to sentences from a text corpus. Using this we built the first large collection of path-sentence pairs.
- Theorised and implemented a task-agnostic framework to contextualise a given input text through commonsense inferences. Achieved state-of-the-art results across a variety of tasks.

**University of Oxford, Cuneiform Digital Library Initiative (CDLI)**

*Research Intern* (Advisors: [Dr. Jacob Dahl](#) and [Dr. Niko Schenk](#))

Summer 2020

Investigating neural machine translation for low-resource cuneiform languages.

- Adapted and evaluated popular NMT techniques for Sumerian-English translation. Worked as a part of the [MTAAC](#) team to build an end-to-end information extraction pipeline for Sumerian.<sup>1</sup>
- Established a saliency-based framework for attributing output translation to input tokens. Conducted informed qualitative evaluations of various models with human experts and Assyriologists.

**IIIT Delhi, Laboratory for Computational Social Systems (LCS2)**

*Research Intern* (Advisor: [Dr. Tanmoy Chakraborty](#))

May 2020–April 2021

Retrieving and detecting closed-domain misinformation across social networks.

## PUBLICATIONS

- [1] *Measures of Information Reflect Memorization Patterns*  
[Rachit Bansal](#), Danish Pruthi, Yonatan Belinkov.  
Neural Information Processing Systems (**NeuIPS**) 2022 (under review)
- [2] *Linear Connectivity Reveals Generalization Strategies*  
Jeevesh Juneja, [Rachit Bansal](#), Kyunghyun Cho, João Sedoc, Naomi Saphra.  
Neural Information Processing Systems (**NeuIPS**) 2022 (under review) [\[Preprint\]](#)
- [3] *Evaluating Explanations: How much do explanations from the teacher aid students?*  
Danish Pruthi, [Rachit Bansal](#), Bhuvan Dhingra, Livio Baldini Soares, Michael Collins, Zachary C. Lipton, Graham Neubig, William W. Cohen.  
Transactions of the Association for Computational Linguistics (**TACL**) [\[Print\]](#)
- [4] *CoSe-Co: Text Conditioned Generative Commonsense Contextualizer*  
[Rachit Bansal](#), Milan Aggarwal, Sumit Bhatia, Jivat Kaur, Balaji Krishnamurthy.
  - North American Chapter of the Association for Computational Linguistics (**NAACL**), 2022
  - Workshop on Commonsense Reasoning and Knowledge Bases at **AKBC**, 2021 [\[Print, Video\]](#)
- [5] *LM-CORE: Language Models with Contextually Relevant External Knowledge*  
Jivat Kaur, Sumit Bhatia, Milan Aggarwal, [Rachit Bansal](#), Balaji Krishnamurthy.
  - North American Chapter of the Association for Computational Linguistics (**NAACL Findings**), 2022
  - Workshop on Commonsense Reasoning and Knowledge Bases at **AKBC**, 2021 [\[Print\]](#)
- [6] *How Low is Too Low? A Computational Perspective on Extremely Low-Resource Languages*  
[Rachit Bansal](#), Himanshu Choudhary, Ravneet Punia, Niko Schenk, Jacob L Dahl, Émilie Pagé-Perron.  
**ACL-IJCNLP** Student Research Workshop (**SRW**), 2021 [\[Print, Slides, Video\]](#)

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<sup>1</sup>[cdli-gh/Sumerian-Translation-Pipeline](#), [cdli-gh/Semi-Supervised-NMT-for-Sumerian-English](#)

- [7] *Combining exogenous and endogenous signals with a co-attention network for early fake news detection*  
 Rachit Bansal, William Scott, Nidhi Sultan, Tanmoy Chakraborty.  
 Pacific-Asia Conference on Knowledge Discovery and Data Mining (**PA-KDD**), 2021 [[arXiv](#), [Slides](#)]
- [8] *Cross-SEAN: A Cross-Stitch Semi-Supervised Attention Model for COVID-19 Fake News Detection*  
 Rachit Bansal, William Scott, Abhay Kaushik, Tanmoy Chakraborty, Shubhashis Sengupta.  
 Journal of Applied Soft Computing [[arXiv](#)]

## TEACHING

### Coding Blocks

New Delhi, India

– *Student Instructor*: Reinforcement Learning

March 2020–May 2020

- Recorded 10-hours worth of lectures and held a number of live webinars. Collaborated with course mentors to build project ideas, assignments, and quizzes.

– *Teaching Assistant*: Machine Learning with Deep Learning

June 2019–Aug 2019

- Conducted classes and doubt sessions for a batch of 60 senior undergraduate students from all across the country. Built course quizzes and programming assignments in collaboration with other TAs.

## ACADEMIC PROJECTS

### Chrome-SEAN: A Browser Extension to Detect Fake News

Built an easy-to-use chrome extension to predict the possibility of a live tweet status being fake. Based on our work at LCS2, IIIT-Delhi, we deployed a Flask-based API of our misinformation detection model.

### Gaze localisation to Measure Sustained Attention

Worked in collaboration with Samsung R&D Lab, Noida, under the guidance of [Dr. Divyashikha Sethia](#) to curate an image processing module to analyze a person's sustained attention. We engineered this using relative positioning of a subject's gaze with respect to certain target regions on their mobile device.

## AWARDS & HONOURS

**Student-** [LxMLS](#), 2021

One of the selected students to attend the 11th Lisbon Machine Learning Summer School.

**Fellow-** [Fatima Predoctoral Fellowship](#), 2021

One of the selected recipients of a fellowship aimed at research mentorship for aspiring PhD students.

**Literary Prodigy Award**, 2015

Awarded by The Young Poets Network, UK, for my published work as a high-school student.<sup>2</sup>

## RELEVANT SERVICE & POSITIONS

- Volunteer**: NAACL 2021, ICLR 2021, EMNLP 2020, NeurIPS 2020, ICML 2020 & ACL 2020
- Co-Founder**, Code to School: An initiative to collaborate with schools across the country and teach high school students programming languages and low-level concepts in computer science.
- Mentor**, Tensorflow, Google Code-In
- ML Lead**, Google Developer Student Club, DTU Chapter
- Joint Secretary**, Sahitya, the Literary and Debating Society of DTU

## FEATURED COURSEWORK

### • *Mathematics*:

Advanced Linear Algebra (2<sup>nd</sup> Sem., DTU; [University Rank-1](#))

[MIT RES-6-012](#): Introduction to Probability, MIT OCW

Abstract Algebra, Group Theory, and Linear Algebra, IIT-KGP ([NPTEL](#))

Numerical and Engineering Optimization Methods (3<sup>rd</sup> Sem., DTU)

Swarm and Evolutionary Optimization (7<sup>th</sup> Sem., DTU)

### • *Machine Learning*:

[IFT 6760A](#): Matrix and tensor factorization techniques for machine learning, University of Montreal

[MIT 18-065](#): Matrix Methods in Signal Processing, and Machine Learning, MIT OCW

Probabilistic Graphical Models Specialization, Stanford University

Bayesian Methods for Machine Learning, National Research University of Russia

### • *Natural Language Processing*:

[CS11-737](#): Multilingual NLP, CMU

[CS11-747](#): Neural Networks for NLP, CMU

Natural Language Processing (6<sup>th</sup> Sem., DTU)

<sup>2</sup>Check out some of my [poetry](#)