

# Madhur Panwar

Ph.D. Student, EPFL

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## EDUCATION

- **École Polytechnique Fédérale de Lausanne (EPFL)** Lausanne, Switzerland  
*Ph.D. in Computer and Communication Sciences* 2024 – Present
  - Advisor: Antoine Bosselut (NLP Lab)
- **Birla Institute of Technology and Science, Pilani (BITS Pilani)** Pilani, India  
*B.E. Computer Science and M.Sc. Mathematics (Dual Degree)* 2016 – 2021
  - CGPA: 9.32/10.00 (**Distinction division**)
  - Recipient of Pratibhashali Award (Department of Mathematics)

## EXPERIENCE

- **Arcadia Impact** Remote  
*Research Engineer & Technical Project Manager* July 2024 – March 2025
  - Worked part-time under the [AI Safety Engineering Taskforce \(ASET\)](#) to build and contribute AI safety evaluations to leading LLM evaluation frameworks: UK AISI's Inspect and METR's Vivaria.
  - Led and mentored a team of engineers developing agentic AI safety evaluations under the [UK AISI bounty programme](#).
- **Microsoft Research** Bangalore, India  
*Research Fellow – Advisor: [Dr. Navin Goyal](#)* Aug 2022 – Aug 2024
  - Worked on understanding the emergent abilities of large language models and how they represent natural language. Our work on In-Context Learning and Bayesian Inference was **accepted at ICLR 2024** and **various NeurIPS 2023 Workshops**.
- **Adobe** Noida, India  
*Software Development Engineer – Manager: [Ganesh R](#)* Jul 2021 – Jul 2022
  - Developed the Landing Pages feature in [Adobe Journey Optimizer \(AJO\)](#), allowing marketers to design and serve landing pages to millions of end users. Received Spot Award for fixing a Customer Service Outage and won the New Hire Coding Bootcamp. Mentored summer internship projects for three students across Machine Learning and Software Engineering domains.
- **Nanyang Technological University** Singapore  
*Undergraduate Thesis – Advisors: [Prof. Chng Eng Siong](#), [Prof. Poonam Goyal](#)* Jan 2021 – Jun 2021
  - Developed a fully Pythonic pipeline for speaker diarization using the x-vector representations and LSTM-based spectral clustering. [[thesis](#)]
- **Amazon** Hyderabad, India  
*Software Development Engineer Intern – Manager: [Pankaj Jain](#)* Aug 2020 – Dec 2020
  - Developed a new module end-to-end for generating the node launch configuration of a major Amazon carrier. The developed features were deployed to production.
- **Adobe** Noida, India  
*Research Intern – Advisors: [Balaji Krishnamurthy](#), [Milan Aggarwal](#)* May 2020 – Jul 2020
  - Worked at the Media and Data Science Research (MDSR) Lab and developed novel approaches to topic modeling. This research has been published as [a long paper at ACL 2021 \(Oral\)](#).
- **University of Victoria** British Columbia, Canada  
*Mitacs Globalink Research Intern – Advisor: [Prof. Ralph Evins](#)* May 2019 – Aug 2019
  - Worked on the development of an open-source project, [BESOS](#), that has been [published in The Journal of Open Source Software \(JOSS\)](#). Formulated and solved building energy optimization problems.
- **Indian Institute of Remote Sensing, Indian Space Research Organisation** Dehradun, India  
*Research Intern – Advisor: [Dr. Shashi Kumar](#)* May 2018 – Jul 2018
  - Developed a system to calibrate Synthetic Aperture Radar (SAR) satellite imagery and a plugin to detect oil spills in SAR images.

**[1] Learning Syntax Without Planting Trees: Understanding Hierarchical Generalization in Transformers** [pdf]

Kabir Ahuja, Vidhisha Balachandran, Madhur Panwar, Tianxing He, Noah A. Smith, Navin Goyal, Yulia Tsvetkov  
*Transactions of the Association for Computational Linguistics* [TACL '25]  
[ICML 2024 Workshop on Mechanistic Interpretability \(Spotlight\)](#)

**[2] InversionView: A General-Purpose Method for Reading Information from Neural Activations** [pdf]

Xinting Huang, Madhur Panwar, Navin Goyal, Michael Hahn  
*The Thirty-eighth Annual Conference on Neural Information Processing Systems* [NeurIPS '24]  
[ICML 2024 Workshop on Mechanistic Interpretability \[Oral; top paper - 2nd place \(500 USD\)\]](#)

**[3] In-Context Learning through the Bayesian Prism** [pdf]

Madhur Panwar<sup>\*</sup>, Kabir Ahuja<sup>\*</sup>, Navin Goyal  
*The Twelfth International Conference on Learning Representations* [ICLR '24]

**[4] TAN-NTM: Topic Attention Networks for Neural Topic Modeling** [pdf]

Madhur Panwar<sup>\*</sup>, Shashank Shailabh<sup>\*</sup>, Milan Aggarwal<sup>\*</sup>, Balaji Krishnamurthy  
*In Proceedings of the 59th Annual Meeting of the Association for Computational Linguistics* [ACL '21 (Oral)]

**[5] In-Context Learning and Bayesian Inference** [pdf]

Madhur Panwar<sup>\*</sup>, Kabir Ahuja<sup>\*</sup>, Navin Goyal  
*NeurIPS 2023 Workshop - Robustness of Few-shot and Zero-shot Learning in Large Foundation Models (R0-FoMo)*

**[6] Surprising Deviations from Bayesian View in In-Context Learning** [pdf]

Madhur Panwar, Kabir Ahuja, Navin Goyal  
*NeurIPS 2023 Workshop - I Can't Believe It's Not Better (ICBINB): Failure Modes in the Age of Foundation Models*

**[7] Transformers Can Learn To Solve Linear-Inverse Problems In-Context** [pdf]

Kabir Ahuja<sup>\*</sup>, Madhur Panwar<sup>\*</sup>, Navin Goyal  
*NeurIPS 2023 Workshop - Deep Learning and Inverse Problems*

**[8] [Re] AdaBelief Optimizer: Adapting Stepsizes by the Belief in Observed Gradients** [pdf]

Anirudh Buvanesh<sup>\*</sup>, Madhur Panwar<sup>\*</sup>  
[ReScience C](#), vol. 8, no. 2, 2022 (accepted under [ML Reproducibility Challenge 2021](#)) [ReScience C'22]  
[Presented at NeurIPS 2022 Journal Track \(Spotlight\)](#)

## PATENTS

**[1] System and Methods for Neural Topic Modeling using Topic Attention Networks** [pdf]

Shashank Shailabh, Madhur Panwar, Milan Aggarwal, Pinkesh Badjatiya, Simra Shahid, Nikaash Puri, S Sejal Naidu, Sharat Chandra Racha, Balaji Krishnamurthy, Ganesh Palwe  
*US Patent Application No. 17/644,856 | Adobe Inc.*

## ACHIEVEMENTS, HONOURS AND AWARDS

- **Runner-up, EuroTeQaThon [🏆], 2025** | We were second in our group. 24 student teams from 9 top European universities presented their solutions at the Eindhoven University of Technology (TU/e). We (team Treeple) developed a tech-based solution that suggests optimal tree planting for maximum benefits.
- **Winner, 1st place (2,000 CHF), Lemanic Life Sciences Hackathon [🏆], 2025** | 12 teams (> 100 people) from across the EU participated. We developed an automated AI-driven system to assign comprehensive rating to games on app playstores, which serves as a tool for early detection of problem gambling (or ludopathy) in children.
- **Research Week with Google, 2023** | Selected by Google Research India among nationwide applicants to attend the "Research Week with Google" event. [certificate]
- **Institute Merit Scholarship, 2016 - 2021** | Received scholarship at BITS Pilani for being in the top 4% of students across all academic departments for all 10 semesters.
- **Hacktoberfest [🏆], 2021** | Contributed to open source projects like [microsoft/ML-For-Beginners](#), [pytorch-ignite](#), [kedro](#) & [TheAlgorithms/Java](#), and was one among the first 50,000 participants to complete the Hacktoberfest challenge.
- **Pratibhashali Award, 2020** | Conferred by the Department of Mathematics, BITS Pilani, for notable achievements in research and academics. [certificate]

- **Mitacs Globalink Research Internship (GRI)** [🌐], **2019** | I was one among the 64 Indian applicants selected for this program by [Mitacs](#) in consultation with AICTE [[AICTE report, page 47](#)]. Under GRI, Mitacs provides funding to conduct research in Canada. This competitive program involves international undergraduate applicants from 15 countries.
- **INSPIRE Scholarship** [🌐], **2015** | Awarded by [DST](#), Government of India, for securing a place among the **top 1% students** in the Indian School Certificate Examination conducted by [CISCE](#).
- **Putani Vignana International Science Talent Examination, 2010** | **Ranked third nationwide.** [[certificate](#)]

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## SERVICES AND TEACHING ASSISTANTSHIPS

- **Reviewing**  
 2025: AAAI, NeurIPS  
 2024: ICML, ACL, ICML Mechanistic Interpretability Workshop  
 2023: NeurIPS R0-FoMo Workshop
- **Volunteering**  
 2024: Review of Application Materials Program (RAMP)  
 2022: NeurIPS Volunteer  
 2021: ACL Volunteer
- **Modern Natural Language Processing (CS-552) - Teaching Assistant, 2025**  
 My responsibilities included leading exercise sessions, creating and grading exams.
- **Logic in Computer Science (CS F214) - Teaching Assistant, 2019**  
 My responsibilities included helping students with the coursework and assignments.
- **Student Faculty Council (SFC) - Member, 2018 - 2019**  
 Discussed the academic concerns of students with the faculty members and the HoD, Department of Mathematics.