

# Neel Bhandari

[neelbhandari6.github.io](https://neelbhandari6.github.io) | [neelbhandari64@gmail.com](mailto:neelbhandari64@gmail.com) | [linkedin.com/in/neelbhandari](https://linkedin.com/in/neelbhandari) | +1-412-284-8313

## EDUCATION

### Carnegie Mellon University

Pittsburgh, PA

*M.S. in Machine Learning and NLP (MIIS), Language Technologies Institute*

*Aug. 2024 - Dec. 2025*

Coursework (Ongoing): Introduction to Machine Learning, Advanced NLP, On-Device Machine Learning.

### R.V. College of Engineering

Bangalore, India

*B.Tech in Computer Science and Engineering, GPA: 8.63/10*

*Aug. 2018-Sept. 2022*

## PUBLICATIONS

1. Out of Style: RAG's Fragility to Linguistic Variation, *COLM 2025 (Under Review)* – (First Author)
2. Aya Model: An Instruction Finetuned Open-Access Multilingual Language Model, *ACL 2024* – **Best Paper Award**
3. Lost In Translation: Generating Adversarial Examples Robust to Round-Trip Translation (Full Paper), *ICASSP 2023* — (First Author)
4. Robust Calibration For Improved Weather Prediction Under Distributional Shift, *Bayesian Deep Learning Workshop, NeurIPS 2021*

## RESEARCH PROJECTS

### RAG Robustness to Linguistic Variations [1]

Aug. 2024 – Present

*Graduate Research Student, Advised by Prof. Maarten Sap*

*Pittsburgh, PA*

- Led a large-scale study evaluating RAG systems across four linguistic dimensions (formality, readability, politeness, grammar), revealing up to 40% performance degradation under real-world query shifts.
- Benchmarked retrieval and generation robustness across multiple QA datasets, nine LLMs, and advanced techniques like HyDE and re-ranking, uncovering key vulnerabilities to linguistic variation.

### Investigating LLM Agent behaviour in Non-Cooperative Social Scenarios

Jan. 2025 - Present

*Graduate Research Student, Advised by Prof. Maarten Sap*

*Pittsburgh, PA*

- Studying the impact of different personality interventions on LLM Agent behaviour when faced with human digital twins across several non-cooperative social settings

### Aya Open Science Project [2]

Jan. 2023 - April 2024

*Member of Core Research Team, Cohere For AI Community*

*Remote*

- Led experimentation and design on quality estimation and human-led pruning of multilingual datasets to understand the impact of data quality on model performance.
- Engineered the development of the data processing pipeline for diverse multilingual datasets, reducing the caching time from several days down to hours.

### Robustness of Text-Based Adversarial Attacks [3]

June 2021 - Mar. 2022

*External Research Student, MIT-IBM Watson AI Lab*

*Remote*

- Collaborated with Dr. Pin-Yu Chen on studying robustness of text-based adversarial attacks from a multilingual lens
- Designed and developed a novel attack-agnostic algorithm that showcased significant improvement in robustness over existing attacks in a round-trip translation setting.

## WORK EXPERIENCE

### Machine Learning Scientist

Aug 2022- July 2024

*PayPal Inc.*

*Bangalore, India*

- Spearheaded research and development behind the first automated Root Cause Identification tool at PayPal, which promised to reduce root cause analysis time by over **75%**.
- Developed, trained and tested language models on proprietary data along with use-case specific metrics for the first LLM-based PayPal Assistant chatbot.
- Led experimentation and testing through fine-tuning and prompt engineering to develop a customer-centric personalisation feature, aimed at solving account specific questions for consumers.

## Machine Learning Intern

April 2022 - July 2022

PayPal Inc.

Bangalore, India

- Developed a proof-of-concept Root Cause Identification tool focused on automated extraction of problem statements and root causes from unstructured chat transcripts.
- Experimented and integrated several techniques such as question-answering, summarisation and cluster-based modelling to create a robust pipeline.

## SUMMER SCHOOLS

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- **Mediterranean Machine Learning Summer School 2023:** Received a fully funded travel and accommodation scholarship for being one of the Top 10 selected applicants out of 800 applications. I was also selected to present a poster at the school.
- **Oxford ML Summer School 2023:** Selected for the highly competitive OxML Summer School. Attended the online version of the school.

## HONORS AND AWARDS

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- Received a fully-funded scholarship to attend the **Mediterranean Machine Learning Summer School 2023**
  - Top 10 applicants out of 800 applications to the summer school.
- Winner of the **IBM Hack Challenge 2020**, consisting of 4000 teams and 10,000 participants.
- Winner of the National Law School Debate (Indian National Debate Championship), Bangalore.
  - Touted to be India's largest institutional debate tournament..
- Champion of the Middle East and Asia Phase of the BDIDF Global Debating Championship.
  - Felicitated by the President of Bangladesh for this accomplishment..

## TEAM AND VOLUNTEER EXPERIENCE

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### Organizer, Cohere For A.I.

Remote

*Organizing the Interactive Reading Group at Cohere For AI*

*July 2022 - June 2024*

### Member and Vice President, R.V. Debating Society

Bangalore, India

*Coach students on several topics such as parliamentary debating, economics, and politics.*

*July 2018 - August 2022*

### Fundraising Executive at S.P.A.R.K

Bangalore, India

*Organized a fundraising campaign for Rs. 2 million for orphanages affected by the pandemic*

*Jan 2020 - March 2021*

### Curriculum Content Developer at Gyanada

Bangalore, India

*Developed an introduction to programming curriculum for underprivileged children*

*March 2021 - April 2021*