

# Suman Adhya

## PhD Scholar at SMCS in IACS

adhyasuman.github.io

@adhyasuman30@gmail.com

linkedin.com/in/sumanadhya

AdhyaSuman

Google Scholar

IACS, Jadavpur, Kolkata-700032, West Bengal, India



## 🎯 Vision Statement

My vision is to channel my expertise in efficient NLP towards the next frontier: making LLMs fundamentally more **transparent** and **computationally tractable**. My research agenda centers on advancing **mechanistic interpretability**, aiming to uncover how internal representations and computations drive model behavior, and on developing new approaches for improving **efficiency** through optimization and adaptive modeling strategies. By bridging these two dimensions, I seek to establish the methodological foundations for **LLMs that are auditable, trustworthy, and resource-efficient**, enabling their responsible deployment in mission-critical and societally impactful applications.

## 👤 Short Bio

I am a final-year Ph.D. candidate at the School of Mathematical & Computational Sciences (SMCS), IACS, specializing in interpretable and efficient NLP, with a focus on topic modeling. My research enhances the quality of topic representations and model efficiency, with publications in venues such as ACL 2025, NAACL 2024, and IEEE-TAI. With my doctoral thesis submission imminent in August 2025, I am actively seeking a full-time research position in either industry or academia.

## 🎓 Education

Ongoing Oct 2020S	Indian Association for the Cultivation of Science Ph.D. from the School of Mathematical & Computational Sciences (SMCS)	Kolkata, India
Jul 2020 Aug 2018	Indian Association for the Cultivation of Science M.Sc. in Mathematics & Computing from SMCS	Kolkata, India
2018 2015	Serampore College, University of Calcutta B.Sc.(Hons.) in Mathematics	Kolkata, India

## </> Research Contributions & Artifacts

### DTECT: Dynamic Topic Explorer & Context Tracker 2025

- > An **end-to-end interactive system** for exploring and interpreting the **evolution of topics in temporal corpora**, integrating **modeling, evaluation, visualization**, and **LLM-assisted insights**.
- > **Artifacts:** [GitHub Codebase](#) | [Hugging Face Demo](#) | [Video Walkthrough](#)

### S2WTM 2025

- > A novel topic model, the **Spherical Sliced-Wasserstein Autoencoder**, that mitigates **posterior collapse** on **hyper-spherical manifolds** to generate more coherent and diverse topics. Presented at **ACL 2025**.
- > **Artifacts:** [GitHub Codebase](#)

### GINopic 2024







- > A topic modeling framework that leverages **Graph Isomorphism Networks (GIN)** to capture the **mutual dependencies between words**, an aspect often missed by contextualized models. Presented at **NAACL 2024**.
- > **Artifacts:** [GitHub Codebase](#)

### CTM-KD 2023

- > A **knowledge distillation** framework to **compress** large topic models by minimizing both cross-entropy and the **2-Wasserstein distance** between latent distributions. Our student model surpasses the teacher in topic coherence with far fewer parameters. Presented at **ECIR 2023**.
- > **Artifacts:** [GitHub Codebase](#)

### CTM-Neg 2022

- > An enhancement for contextualized topic models that introduces a **negative sampling** mechanism using a **triplet loss** on perturbed document-topic vectors. This approach significantly improves both **topic coherence** and **diversity**. Presented at **ICON 2022**.
- > **Artifacts:** [GitHub Codebase](#)

- [P] **DTECT: Dynamic Topic Explorer & Context Tracker**   
Suman Adhya and Debarshi Kumar Sanyal  
[Code](#) / [Demo](#) / [Video](#) [arXiv]
- [C] **S2WTM: Spherical Sliced-Wasserstein Autoencoder for Topic Modeling**   
Suman Adhya and Debarshi Kumar Sanyal  
*Association for Computational Linguistics, Vienna, Austria* [ACL'25]
- [J] **Evaluating Negative Sampling Approaches for Neural Topic Models**   
Suman Adhya, Avishek Lahiri, Debarshi Kumar Sanyal, and Partha Pratim Das  
*IEEE Transactions on Artificial Intelligence*  
*An extension of work initiated under the guidance of Prof. Partha Pratim Das (Ashoka University).* [IEEE-TAI]
- [C] **GINopic: Topic Modeling with Graph Isomorphism Network**   
Suman Adhya and Debarshi Kumar Sanyal  
*North American Chapter of the Association for Computational Linguistics, Mexico City, Mexico* [NAACL'24]
- [C] **Do Neural Topic Models Really Need Dropout? Analysis of the Effect of Dropout in Topic Modeling**   
Suman Adhya, Avishek Lahiri, and Debarshi Kumar Sanyal  
*17th European Chapter of the Association for Computational Linguistics, Dubrovnik, Croatia* [EACL'23]
- [C] **Improving Neural Topic Models with Wasserstein Knowledge Distillation**   
Suman Adhya and Debarshi Kumar Sanyal  
*45th European Conference on Information Retrieval, Dublin, Ireland* [ECIR'23]
- [C] **Improving Contextualized Topic Models with Negative Sampling**   
Suman Adhya, Avishek Lahiri, Debarshi Kumar Sanyal, and Partha Pratim Das  
*19th International Conference on Natural Language Processing, New Delhi, India*  
*This work was initiated under the foundational guidance of Prof. Partha Pratim Das (IIT Kharagpur).* [ICON'22]
- [W] **What Does the Indian Parliament Discuss? An Exploratory Analysis of the Question Hour in the Lok Sabha**   
Suman Adhya and Debarshi Kumar Sanyal  
*1st Workshop on Natural Language Processing for Political Sciences, LREC, Marseille, France* [PoliticalNLP @ LREC'22]

## Skills


<b>Programming Languages</b>	Python (Proficient), C, R (Familiar)
<b>Tools &amp; Frameworks</b>	PyTorch, TensorFlow, HuggingFace, LangChain, Scikit-learn, Pandas, Scipy, Gensim, Sentence-Transformers, PyTorch Geometric (PyG), FAISS, Streamlit, Git, Docker
<b>Algorithms &amp; Methods</b>	Topic Modeling, Representation Learning, Knowledge Distillation, Negative Sampling, Optimal Transport, Graph Neural Networks (GNNs)


## Presentations

- > ACL 2025, Poster Presentation  July 2025 (Vienna, Austria)
- > PIC 2025, Lighting Talk and Poster Presentation  Feb 2025 (Mysore, India)
- > NAACL 2024, Poster Presentation  June 2024 (Virtual)
- > PIC 2024, Poster Presentation  Feb 2024 (Mysore, India)
- > EACL 2023, Poster Presentation  May 2023 (Dubrovnik, Croatia)
- > ECIR 2023, Short Paper Presentation  March 2023 (Virtual)
- > ICON 2022, Full Paper Presentation  December 2022 (IIIT-Delhi, India)
- > PoliticalNLP @ LREC 2022, Poster Presentation  June 2022 (Virtual)


## Travel Grants and Awards


---


**ACM India-IARCS Travel Grant, 2025**  : Awarded for presenting our paper at ACL'25 held in Vienna, Austria.


**ANRF-International Travel Support, 2025**  : Awarded for presenting our paper at ACL'25 held in Vienna, Austria.


**ACM India Research Facilitation Grant, 2025**  : Awarded to cover the extra page charges of our paper at IEEE-TAI.


**Microsoft Research Travel Grant, 2024**  : Awarded for presenting our paper at NAACL'24 held in Mexico City, Mexico.


**ACM India-IARCS Travel Grant, 2024**  : Awarded for presenting our paper at NAACL'24 held in Mexico City, Mexico.

**Travel Grant for Research Week with Google, 2024**  : Awarded for attending Research Week with Google, a three-day lineup of research lectures, panels, and discussions led by esteemed researchers.

**Travel Grant for PIC, 2024**  : Awarded for attending flagship research networking event of ACM India held in the Infosys Mysore campus, India.

**Travel Grant for CODS-COMAD, 2024**  : Awarded for attending the 7th Joint International Conference on Data Sciences and Management of Data to be held in IIIT Bangalore, India.

**Microsoft Research Travel Grant, 2023**  : Awarded for presenting our paper at EACL'23 held in Dubrovnik, Croatia.

**Travel Grant for EACL, 2023**  : Awarded for presenting our paper at EACL'23 held in Dubrovnik, Croatia.

**The INSPIRE-SHE Award, DST, 2015-2018**  : Awarded for securing a top 1% rank in Class 12th examinations.

## Teaching Assistant

---

**Introduction to Machine Learning [PHD 226/ COM 4203], IACS**

January - June, 2024

- > Assisted a graduate-level course with approximately **20 students**.
- > **Responsibilities:** Designed and graded all programming assignments, and conducted dedicated doubt-clearing sessions to resolve student queries.
- > **Topics Covered:** Assignments spanned key ML concepts, including Linear Regression, Decision Trees, SVM, k-NN, the EM Algorithm, and Neural Networks.

**Laboratory - Numerical Methods (PHS 4211), IACS**








January - June, 2021




- > Managed lab sessions for a cohort of **20+ master's students**.
- > **Responsibilities:** Designed and graded weekly lab assignments in Python. Conducted tutorials and dedicated doubt-clearing sessions to support students with implementation.

## Academic Responsibility

---

**Volunteer coordinator** EACL'23 

**Review committee member** ARR - Feb'25 , EMNLP'24 Industry Track , ARR - June'24 , ARR - April'24 , ARR - February'24 , ACL'23 , EMNLP'22 

**Program committee member** PoliticalNLP'24 , EMNLP'23 Industry Track , PoliticalNLP'22 

## Community Service

---

**Student Representative, Anti-Ragging Cell, IACS**

2023 - Current

*Actively contribute to fostering a safe and supportive campus environment for all students.*

**Research and Technical Assistant, Research Scholars' Association, IACS**

2023-2024

*Provided technical support and research guidance to fellow scholars within the association.*

**System Manager, Research Scholars' Association, IACS**

2022-2023

*Managed and maintained the IT infrastructure and online resources for the scholars' association.*

## References

---

References will be provided on request.