

# Harshita Chopra

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## RESEARCH INTERESTS

Machine Learning (ML), Reasoning and Planning in Large Language Models (LLM), Personalization, User Modeling

## EDUCATION

### Ph.D. in Computer Science & Engineering

2024 – present

University of Washington, Seattle, US – Advisor: Prof. Chirag Shah

### B.Tech. in Information Technology

2018 – 2022

Indraprastha University, Delhi, India – GPA: 9.01/10.0

## EXPERIENCE

### Microsoft Research – Research Intern

Summer 2025

Mentors: Dr. Krishna Chintalapudi, Dr. Ryan White, Dr. Suman Nath

Redmond, US

- Planning with LLMs for personalized memory retrieval in tool-calling AI agents.

### Adobe Research – Research Associate II

Jul 2022 – Aug 2024

Data-driven Systems and Insights Group

Bangalore, IN

- Developed **ML and optimization** models for predictive user segmentation and reach maximization.
- **Trained and evaluated LLMs** for simulating online user behavior as a sequence of browsed pages and transaction events.
- Shipped work across 2 **products** (AEP and Acrobat), mentored 2 graduate and 9 UG interns; published 3 **papers** and 8 **patents**.

### Adobe Research – Research Intern

Summer 2021

Big Data Experience Lab. Mentor: Dr. Atanu R Sinha

Bangalore, IN

- Modeled **partially observed** user behavior on websites using actor-critic **RL** and **Boosting** techniques.
- Developed a two-step training process with a loss function to optimize clustering quality and target prediction accuracy.

### University of California, Irvine – Undergraduate Researcher

Feb 2021 – 2022

Language and Learning Analytics Lab. Advisor: Prof. Nia Dowell-Nixon

Remote

- Devised a framework to detect and track the **temporal flow of topics** in online academic discussion forums.

### IIT Delhi – Undergraduate Researcher

Oct 2020 – 2021

- Demonstrated that new knowledge can be captured by tracking the **temporal evolution** of association between **entities in scientific literature** using NLP and community detection on entity networks. Advisor: Prof. Tavpritesh Sethi

### Omdena Inc. – Machine Learning Engineer

Apr – Dec 2020

- Led end-to-end **AI4Good** projects with the United Nations Development Program (**UNDP**) and the World Resources Institute (**WRI**); Developed predictive models of the Digital Divide and modeled economic well-being using multi-modal data.

## PUBLICATIONS

### Conference:

- [1] **H Chopra**, C Shah. “Feedback-Aware Monte Carlo Tree Search for Efficient Information Seeking in Goal-Oriented Conversations”. [NeurIPS 2025](#) ★ **Spotlight** [*top 3%*] | [ICLR 2025](#) Workshop on Reasoning & Planning for LLMs (*Oral*)
- [2] S Sundaresan, **H Chopra**, A R Sinha, K Goswami, N S Naidu, R Karan, and N Anushka. “Subjective Behaviors and Preferences in LLM: Language of Browsing.” [EMNLP 2025](#) (*Oral*). [*acceptance rate 22%*]
- [3] **H Chopra**, A R Sinha, S Choudhary, R A Rossi, P Indela, V P Parwatala, S Paul, and A Maiti. “Delivery Optimized Discovery in Behavioral User Segmentation under Budget Constraint”. [CIKM 2023](#) (*Oral*). [*acceptance rate 24%*]
- [4] A R Sinha\*, **H Chopra**\*, A Maiti, A Ganesh, S Kapoor, S Myana, and S Mahapatra. “The Role of Unattributed Behavior Logs in Predictive User Segmentation”. [CIKM 2023](#) (*Oral*). [*acceptance rate 24%*]

[5] **H Chopra**, Y Lin, M A Samadi, J G Cavazos, R Yu, S Jaquay, and N Nixon. "Semantic Topic Chains for Modeling Temporality of Themes in Online Student Discussion Forums". [EDM 2023](#) (*Best paper award nominee*) | [AIED 2022](#) (*Extended Abstract*)

*Journal:*

[1] R Pal, **H Chopra**, R Awasthi, H Bandhey, A Nagori, and T Sethi. "Predicting Emerging Themes in Rapidly Expanding COVID-19 Literature With Unsupervised Word Embeddings and Machine Learning: Evidence-Based Study". *Journal of Medical Internet Research*. [JMIR](#) 2022 (*impact factor 7.2, ranked Q1 in Medical Informatics*)

[2] **H Chopra\***, A Vashishtha\*, R Pal, Ashima, A Tyagi, and T Sethi. "Mining Trends of COVID-19 Vaccine Beliefs on Twitter With Lexical Embeddings: Longitudinal Observational Study". [JMIR Infodemiology](#) 2023.

*Patents:*

\* equal contribution

[1] S N Sunderesan, A R Sinha, **H Chopra**, K Goswami, R Karan, N S Naidu, N Anushka. "Heterogeneous LLMs for Subjective Behaviors". [Filed] US Patent Application.

[2] **H Chopra**, A R Sinha, S Mahapatra. "Utilizing Digital Page Sequence Tokens With Large Language Models to Generate Digital Content Predictions". [Filed] US Patent Application No.: 18/829,774

[3] **H Chopra**, S Choudhary, A R Sinha, S Surange-Dev, V Holtcamp, S Nair, Z Courtois, S Bhat. "Campaign Journey User Response Computer Simulation". [Filed] US Patent Application No.: 18/777,311

[4] V Porwal, **H Chopra**, A R Sinha, S K Modanwal, C N Reddy, Z Niaz. "Clustering Users According to Causal Relationships Among User Data". [Filed] US Patent Application No.: 18/609,625

[5] S Choudhary, A R Sinha, **H Chopra**, R A Rossi, V P Parwatala, P Indela, S Paul, S Guo. "Segment Discovery and Channel Delivery". [Filed] US Patent Application No.: 18/543,666

[6] A R Sinha, R A Rossi, S Choudhary, **H Chopra**, P Indela, V P Parwatala, S Paul, S Mahapatra, A Maiti. "Delivery Aware Audience Segmentation". [Filed] US Patent Application No.: 18/451,590

[7] A Maiti, A R Sinha, **H Chopra**, S Kapoor, A Ganesh, S Myana, S Mahapatra. "Generating Segments of Users Based on Unobserved Behaviors". [Filed] US Patent Application No.: 17/660,544

[8] A R Sinha, A Maiti, A Ganesh, **H Chopra**, S Myana, S Kapoor, S Mahapatra. "Systems and Methods for Content Customization". [Filed] US Patent Application No.: 17/813,622

## SELECTED PROJECTS

**Feedback-Aware Planning for Information-Seeking under Uncertainty** – UW Seattle [NeurIPS '25]

- Developed a novel framework that uses **LLMs** for **seeking missing information** by applying **Monte Carlo Tree Search** to select questions that reduce uncertainty, as a part of **inference-time planning**.
- Proposed a **hierarchical feedback** mechanism to enable learning from past successful questioning trajectories.

**Personalized Language Models for Predicting Online User Behavior** – Adobe Research [EMNLP '25]

- Developed HeTLM (**Heterogeneity-aware Training** of LMs), a cluster-based training framework for **small language models** that learns diverse user browsing behaviors.
- Achieved significantly higher accuracy in **predicting next-page visits** and **purchase outcomes** compared to larger LMs.

**Delivery Aware Discovery of Behavior-based User Segments** – Adobe Research [CIKM '23]

- Developed a **joint stochastic optimization** model for effective discovery of user segments based on browsing behavior and matching them with marketing/media channels that maximize reach, under a given **budget constraint**.

**Detection of Emerging Themes in Scientific Literature** – IIIT Delhi [JMIR '22]

- Detected and predicted disease-centric themes in COVID-19 literature using **temporal link prediction** and word embeddings to track the **evolving semantic similarity** among entities. Demo: [EvidenceFlow](#)

## RECOGNITION & AWARDS

- Received the **Microsoft Research Redmond Azure Credit Award** of \$4500 for Research Collaboration post internship.
- Recipient of the **ICLR 2025 Student Registration Grant** for attending the conference and workshops.
- Recognized among top **8 out of 84** research interns; offered a conversion to full-time role at **Adobe Research**.
- Department Rank 1** in the final semester of undergraduate degree – Scored GPA 10/10.
- GHC 2021 Scholar** – Won the student scholarship to attend the Grace Hopper Celebration.

- **Vice Chairperson – IEEE** Women in Engineering (2020-21), Student Branch Executive Committee of MSIT.
- **Invited Talk** at IE Business School, Madrid – On Collaborative AI projects and Ethics in the Information Age. 2020.
- **Invited Speaker** on a Panel of Experts from NASA and Harvard University – “Building Artificial Intelligence through Collaborative Innovation”, a virtual event with over 1000 registrations, hosted by Omdena Inc. in 2020.
- Among **top 10 students** from the country selected for the **Digital India** Internship at **NIC** Headquarters, Winter 2019-20. My redesigned interface of eTransport web portal ‘Vahan Citizen Services’ was **deployed nationwide** by Govt of India.

## TECHNICAL SKILLS

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- Programming languages: Python, SQL, C/C++, Bash
- Packages & Frameworks: PyTorch, TensorFlow, Keras, scikit-learn, SciPy, Git, PySpark, LATEX

## ACADEMICS

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- **Ph.D. Coursework:** CSE 573 (Artificial Intelligence), CSE 546 (Machine Learning), IMT 526 (Building and Applying LLMs), CSE 599 (Social Reinforcement Learning)
- **Teaching Assistant:** CSE 447 (Natural Language Processing) with Prof. Noah Smith

## VOLUNTEER EXPERIENCE

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- **Data Science Researcher** – PathCheck Foundation, MIT  
Brainstormed effective and affordable COVID-19 mitigation strategies. Our submission “Privacy-preserving Crowdsourcing for Citizen Engagement in Pandemics” was awarded as one of the ‘*Highly Commended Solutions*’ at The Trinity Challenge 2021
- **Data Analyst** – Red Dot Foundation | Safecity  
Developed dashboards based on inferential statistics on past 8 years of crowd-sourced harassment reports. 2020