

Ashish Mittal

RESEARCH SCIENTIST

IBM Research, India

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Work Experience

IBM Research

Bangalore, India

RESEARCH SCIENTIST

June 2022 - Present

- Led improvements to the Granite LLM series (v3.1 → 3.3) for Indic languages via pretraining data curation, large-scale synthetic data generation, and RLAI/RLVR post-training, delivering significant gains on Indic benchmarks. 🔗
- Drove evaluation and alignment of Granite-Speech multimodal LLM, reducing hallucinations and strengthening safety, resulting in top ranking on HuggingFace OpenASR leaderboard. 🔗
- Customized Granite embedding models via synthetic data augmentation for an Indic legal-domain demo, improving robustness and domain-specific retrieval accuracy.

SENIOR RESEARCH ENGINEER

July 2019 - Jun 2022

- Developed text-only customization methods using corpus adaptation and keyword dictionaries, integrated into IBM Watson Speech-to-Text and adopted by enterprise clients for domain-specific adaptation. 🔗
- Expanded IBM's Speech-to-Text portfolio by adding Hindi language support, extending coverage to millions of Hindi speakers. 🔗
- Co-organized MUCS 2021 workshop on multilingual and code-switched ASR, advancing community benchmarks for Indian languages. 🔗

RESEARCH ENGINEER

Apr 2017 - July 2019

- Designed and deployed an enterprise-grade conversational AI system leveraging NLP, intent recognition, dialog management, and knowledge grounding, enabling natural language querying of large datasets and driving adoption across IBM Cognos Analytics. 🔗

BLUE SCHOLAR

July 2015 - Apr 2017

- Co-developed ATHENA, an ontology-driven natural language interface to relational databases, enabling semantic querying of structured data; results published at VLDB 2016 and 2017.

Education

Indian Institute of Technology Bombay

Mumbai, India

PHD, COMPUTER SCIENCE

Jan 2021 - July 2025

- *Advisors:* Prof. Sunita Sarawagi, Prof. Preethi Jyothi (CGPA: 9.0/10.0)
- *Thesis:* Text-Only Contextualization of Speech Recognition through Retrieval, Adaptation, and LLM Integration

Indian Institute of Technology Bombay

Mumbai, India

M.TECH, COMPUTER SCIENCE

July 2013 - May 2015

- *Advisors:* Prof. Sunita Sarawagi, Prof. Ganesh Ramakrishnan, Prof. Mausam (IIT Delhi)
- *Dissertation:* Numerical Relation Extraction with Minimal Supervision (CGPA: 9.7/10.0)

Dharmsinh Desai University

Nadiad, India

B.E, COMPUTER SCIENCE

July 2008 - May 2012

- Percentage: 84.79, Ranked 1st in the university comprising of 650 students in that batch.

Publications

Mathematics Isn't Culture-Free: Probing Cultural Gaps via Entity and Scenario Perturbations

Arxiv

ADITYA TOMAR, NIHAR RANJAN SAHOO, **ASHISH MITTAL**, RUDRA MURTHY, PUSHPAK BHATTACHARYA

July 2025

Granite-speech: open-source speech-aware LLMs with strong English ASR capabilities

ASRU 2025

GEORGE SAON, AVIHU DEKEL, ALEXANDER BROOKS, TOHRU NAGANO, **ASHISH MITTAL** AND OTHERS

Accepted

RECAST: Retrieval-Augmented Contextual ASR via Decoder-State Keyword Spotting

EMNLP 2025

ASHISH MITTAL, PREETHI JYOTHI, SUNITA SARAWAGI

Accepted (findings)

Power doesn't reside in size: A Low Parameter Hybrid Language Model for Sentiment Analysis in Code-mixed data

EMNLP 2025

PAVAN SAI BALAGA, NAGASAMUDRAM KARTHIK, CHALLA VISHWANATH, RAKSHA SHARMA, RUDRA MURTHY, **ASHISH MITTAL**

Accepted (main)

SKIP-SALSA: Skip Synchronous Fusion of ASR LLM Decoders [Oral]

Interspeech 2025

ASHISH MITTAL*, DARSHAN PRABHU*, PREETHI JYOTHI, SUNITA SARAWAGI

Rotterdam, Netherlands

INDIC QA BENCHMARK: A Multilingual Benchmark to Evaluate Question Answering capability of LLMs for Indic Languages

ABHISHEK SINGH, VISHWAJEET KUMAR, RUDRA MURTHY, JAYDEEP SEN, **ASHISH MITTAL**, GANESH RAMAKRISHNAN

NAACL (findings) 2025

Albuquerque, United States

Salsa: Speedy ASR-LLM Synchronous Aggregation [**Nominated for Best Student Paper**]

ASHISH MITTAL*, DARSHAN PRABHU*, PREETHI JYOTHI, SUNITA SARAWAGI

Interspeech 2024

Kos, Greece

Speech-enriched Memory for Inference-time Adaptation of ASR Models to Word Dictionaries

ASHISH MITTAL, PREETHI JYOTHI, SUNITA SARAWAGI, GEORGE SAON, GAKUTO KURATA

Singapore

Improving RNN-Transducers with Acoustic LOOKAHEAD

VINIT UNNI, **ASHISH MITTAL**, PREETHI JYOTHI, SUNITA SARAWAGI

Interspeech 2023

Dublin, Ireland

In-Situ Text-Only Adaptation of Speech Models with Low-Overhead Speech Imputations

ASHISH MITTAL,SUNITA SARAWAGI, PREETHI JYOTHI

ICLR 2023

Kigali, Rwanda

Soft Random Sampling: A Theoretical and Empirical Analysis

XIAODONG CUI, **ASHISH MITTAL**, SONGTAO LU, WEI ZHANG, GEORGE SAON, BRIAN KINGSBURY

Arxiv 2023

Distributed Gradient Matching-based Data Subset Selection for Compute-Efficient and Robust ASR Training

ASHISH MITTAL*, DURGA S*, RISHABH IYER, GANESH RAMAKRISHNAN, PREETHI JYOTHI

EMNLP (Findings) 2022

Abu Dhabi, UAE

Adaptive Discounting of Implicit Language Models in RNN-Transducers

VINIT UNNI*, SHREYA KHARE*, **ASHISH MITTAL**, PREETHI JYOTHI, SUNITA SARAWAGI

ICASSP 2022

Singapore

Low Resource ASR: The surprising effectiveness of High Resource Transliteration

SHREYA KHARE*, **ASHISH MITTAL***, ANUJ DIWAN*, SAMARTH BHARADWAJ, PREETHI JYOTHI, SUNITA SARAWAGI

Interspeech 2021

Brno, Czech Republic

Multilingual and code-switching ASR challenges for low resource Indian languages

ANUJ DIWAN, **ASHISH MITTAL**, SHREYA KHARE, SAMARTH BHARADWAJ AND OTHERS

Interspeech 2021

Brno, Czech Republic

Bootstrapping Chatbot Interfaces to Databases

ASHISH MITTAL, DIPTIKALYAN SAHA, PARAG JAIN, JAYDEEP SEN, MANASA JAMMI, KARTHIK SANKARANARAYANAN

CODS-COMAD 2021

Bangalore, India

Optimizing Interpretation Generation in Natural Language Query Answering for Real Time End Users

JAYDEEP SEN, DIPTIKALYAN SAHA, **ASHISH MITTAL**, KARTHIK SANKARANARAYANAN

CODS-COMAD 2021

Bangalore, India

Representation Based Meta-Learning For Few-Shot Spoken Intent Recognition

ASHISH MITTAL, SAMARTH BHARADWAJ, SHREYA KHARE, SANEEM CHEMMENGATH, KARTHIK SANKARANARAYANAN, BRIAN KINGSBURY

Interspeech 2020

Shanghai, China

ATHENA++: Natural Language Querying for Complex Nested SQL Queries

JAYDEEP SEN, CHUAN LEI, ABDUL QUAMAR, FATMA ÖZCAN, VASILIS EFTHYMIU, AYUSHI DALMIA, GREG STAGER, **ASHISH MITTAL**, DIPTIKALYAN SAHA ,KARTHIK SANKARANARAYANAN

VLDB 2020

Tokyo, Japan

Unified Semantic Parsing with Weak Supervision

PRIYANKA AGRAWAL, PARAG JAIN, AYUSHI DALMIA, ABHISHEK BANSAL, **ASHISH MITTAL**, KARTHIK SANKARANARAYANAN

ACL 2019

Florence, Italy

Natural Language Querying of Complex Business Intelligence Queries.

JAYDEEP SEN, FATMA ÖZCAN, ABDUL QUAMAR, GREG STAGER, **ASHISH MITTAL**, MANASA JAMMI, CHUAN LEI, DIPTIKALYAN SAHA, KARTHIK SANKARANARAYANAN

ACM SIGMOD 2019

Amsterdam, The Netherlands

Ontology-Based Natural Language Query Interfaces for Data Exploration

CHUAN LEI, FATMA ÖZCAN, ABDUL QUAMAR, **ASHISH MITTAL**, JAYDEEP SEN, DIPTIKALYAN SAHA, KARTHIK SANKARANARAYANAN

IEEE Data Engineering Bulletin, 2018

Volume 41, Number 3.

Tooling Framework for Instantiating Natural Language Querying System

MANASA JAMMI, JAYDEEP SEN, **ASHISH MITTAL**, SAGAR VERMA, VARDAAN PAHUJA, REMA ANANTHANARAYANAN, PRANAY LOHIA, HIMA KARANAM, DIPTIKALYAN SAHA, KARTHIK SANKARANARAYANAN

VLDB 2018

Rio De Janeiro, Brazil

Functional Partitioning of Ontologies for Natural Language Query Completion in Question Answering Systems

JAYDEEP SEN, **ASHISH MITTAL**, DIPTIKALYAN SAHA, KARTHIK SANKARANARAYANAN

IJCAI 2018

Stockholm, Sweden

An Ontology based Dialog Interface to Database

ASHISH MITTAL, JAYDEEP SEN, DIPTIKALYAN SAHA, KARTHIK SANKARANARAYANAN

ACM SIGMOD 2018

Houston, United States

Creation and Interaction with Large-scale Domain-Specific Knowledge Bases

LAURA CHITICARIU, **ASHISH MITTAL**, FATMA ÖZCAN, ABDUL QUAMAR, DIPTIKALYAN SAHA, KARTHIK S., JAYDEEP SEN AND OTHERS

VLDB 2017

Munich, Germany

ATHENA: an ontology-driven system for natural language querying over relational data stores

DIPTIKALYAN SAHA, AVRILIA FLORATOU, KARTHIK SANKARANARAYANAN, UMAR FAROOQ MINHAS, **ASHISH R. MITTAL**, AND FATMA ÖZCAN.

VLDB 2016

New Delhi, India

Numerical Relation Extraction with Minimal Supervision

AMAN MADAAN*, **ASHISH MITTAL***, MAUSAM, GANESH RAMAKRISHNAN, AND SUNITA SARAWAGI

AAAI 2016

Phoenix, United States

Patents

Ontology driven contextual automated speech recognition

ASHISH MITTAL, SHREYA KHARE, SAMARTH BHARADWAJ

US12315496B2

2022

Artificial intelligence factsheet generation for speech recognition

SHREYA KHARE, **ASHISH MITTAL**, SANEEM CHEMMENGATH, SAMARTH BHARADWAJ, KARTHIK SANKARANARAYANAN

US20230419950A1

2022

Automated domain-specific constrained decoding from speech inputs to structured resources

ASHISH MITTAL, SAMARTH BHARADWAJ, SHREYA KHARE, KARTHIK SANKARANARAYANAN

US20230215427A1

2022

Active learning for Natural Language Question Answering

JAYDEEP SEN, KARTHIK SANKARANARAYANAN, **ASHISH MITTAL**,

US11971886B2

2021

Domain query execution using user-provided definition

JAYDEEP SEN, **ASHISH MITTAL**, DIPTIKALYAN SAHA, KARTHIK SANKARANARAYANAN

US11294907B2

2020

Multi-agent conversational agent framework

ASHISH MITTAL, DIPTIKALYAN SAHA, PRIYANKA AGRAWAL, MANASA JAMMI

US12086561B2

2019

Natural Language interface databases

JAYDEEP SEN, DIPTIKALYAN SAHA, KARTHIK SANKARANARAYANAN, **ASHISH MITTAL**, MANASA JAMMI

US11200222B2

2019

Automated generation of test cases for analyzing natural language interfaces to database systems

DIPTIKALYAN SAHA, JAYDEEP SEN, MANASA JAMMI, **ASHISH MITTAL**

US10977164B2

2018

Ontology-based automatic bootstrapping of state based dialog systems

JAYDEEP SEN, PARAG JAIN, DIPTIKALYAN SAHA, **ASHISH MITTAL**

US10839160B2

2018

Ontology refinement based on query inputs

ASHISH MITTAL, DIPTIKALYAN SAHA, KARTHIK SANKARANARAYANAN, JAYDEEP SEN

US10810246B2

2017

Ontology-based query suggestion using eye tracking

ASHISH MITTAL, DIPTIKALYAN SAHA, KARTHIK SANKARANARAYANAN, JAYDEEP SEN

US20190087486A1

2017

Interactive dialog in natural language using an ontology

ASHISH MITTAL, DIPTIKALYAN SAHA, KARTHIK SANKARANARAYANAN, JAYDEEP SEN

US10621166B2

2017

Translating structured languages to natural language using domain-specific ontology

ASHISH MITTAL, DIPTIKALYAN SAHA, KARTHIK SANKARANARAYANAN

US20180210879A1

2017

Providing notifications in video streams to control video playback

VIJAY EKAMBARAM, **ASHISH MITTAL**, RUHI SHARMA MITTAL, Y SHRINIVASAN

US11208226B2

2016

Talks & Tutorials

Tutorial on understanding and mitigating the hallucinations in NLP and Speech

CODS-COMAD

Bangalore, India

2024

Full Day Workshop on End-to-End Speech Recognition

INDIRA GANDHI DELHI TECHNICAL UNIVERSITY FOR WOMEN

Online

2020 & 2021

Invited Talk on natural language querying over databases

IBM RESEARCH-IISC WORKSHOP ON KNOWLEDGE AND LEARNING

IISc Bangalore

2018

Invited Talk on natural language querying over databases

JAPAN ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY

Bangalore, India

2017

Honors & Awards

2025	IBM Stock Award , Twice awarded the prestigious IBM Stock Award for leadership in driving impactful research and innovation, selected annually by the CEO for a few individuals globally.	IBM Research
2024	Best Student Paper Nomination , for <i>SALSA: Speedy ASR-LLM Synchronous Aggregation</i> .	Interspeech
2024	Manager's choice award , Won the award 6 times since joining IBM Research. The award is given for taking research initiatives, client deliveries and leadership.	IBM Research
2022	Cash Award , Recipient of IBM's Council for Innovation Leadership for my work with IBM's patent process as part of the Invention Development Team.	IBM Research
2022	Outstanding Technical Achievement Award , Recipient of IBM's Outstanding Technical Achievement Award for my work on the COVID-Assist and connect platform.	IBM Research
2020	Performance Award , Recipient of IBM's Performance Award for my ongoing work in adding indic languages to IBM's NLU product. This is an individual award which is given to select researchers globally.	IBM Research
2019	Research Division Award , Recipient of IBM Research Division Award for my work in Natural language querying technology for Aditya Birla Retail (ABFRL) client win.	IBM Research
2019	Eminence and Excellence Award , Recipient of IBM Research's Eminence and Excellence cash award on demonstrating exemplary teamwork towards the NLQ for Retail Accomplishment.	IBM Research
2017	Distinguished Paper Award , Recipient of IBM India Research Lab's Distinguish Paper Award for our paper published in VLDB 2016.	IBM Research
2014	Winner , Won the AngelHack Hackathon held in Mumbai out of 38 teams. Selected for the finals and accepted at HACKcelerator program with office space, mentorship and \$5000 worth of Amazon AWS credits (declined).	IIT Bombay

MISCELLANEOUS

2015	Rank 2 , Obtained Department Rank 2 out of 120 students in M.Tech CSE at IIT Bombay.	IIT Bombay
2013	All India Rank 11 , Obtained All India Rank 11 out of 2,24,160 students in the entrance exam for post graduate admissions(GATE) in India.	India
2012	Certificate of Excellence, Top Ranker , Awarded Certificate of Excellence, Top Ranker 2012 from Nasscom for being a top ranker in Department of Computer Engineering at Dharmsinh Desai University.	Nadiad, India
2010	Eklavya Scholarship of Excellence , Awarded Eklavya Scholarship of Excellence for first position in the Department of Computer Engineering at Dharmsinh Desai University	Nadiad, India

Academic Services

2025	Program Committee , Interspeech, ARR, Neurips, COLM
2024	Program Committee , Interspeech, ARR, AAAI, Neurips, ICML, ICLR, COLM, ICASSP
2023	Program Committee , ICLR, ICASSP, ACL, Neurips, ICML, CODS-Comad
2023	Program Committee , ICLR, ICASSP, ACL, Neurips
2022	Program Committee , EMNLP, AI-ML systems, Neurips, ICML, ICASSP, AAAI, CODS-Comad
2021	Program Committee , EMNLP, ICLR, NAACL, AAAI (among top 25% members), CODS-Comad
2020	Program Committee , AAAI (among top 25% members), CODS-Comad
2019	Program Committee, Industry Track , CODS-Comad