

# Dheeraj Mekala

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Computer Science & Engineering  
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🏠 <http://dheeraj7596.github.io/>  
🎓 Google Scholar

## RESEARCH INTERESTS

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I envision the future of AI as a proactive and collaborative tool for humans that is capable of utilizing external tools. I am currently interested in enabling the interplay between humans and large language models (LLMs) with minimal annotation and training costs.

## EDUCATION

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**University of California, San Diego** 2021 - present  
*PhD in Computer Science*  
Advisor: Prof. Jingbo Shang

**University of California, San Diego** 2019 - 2021  
*MS in Computer Science, Thesis Track*  
*2021 UCSD CSE Master's Award for Excellence in Research.*  
Advisor: Prof. Jingbo Shang

**Indian Institute of Technology Kanpur** 2013 - 2017  
*B.Tech in Computer Science and Engineering*

## PUBLICATIONS

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### Conference Publications

- ZEROTOP: Zero-Shot Task-Oriented Semantic Parsing using Large Language Models**  
Dheeraj Mekala, Jason Wolfe, Subhro Roy  
*Conference on Empirical Methods in Natural Language Processing (EMNLP), 2023.*
- SELFOOD: Self-Supervised Out-Of-Distribution Detection via Learning to Rank**  
Dheeraj Mekala\*, Adithya Samavedhi\*, Chengyu Dong, Jingbo Shang  
*Findings of the Conference on Empirical Methods in Natural Language Processing (EMNLP), 2023.*
- A Benchmark on Extremely Weakly Supervised Text Classification: Reconcile Seed Matching and Prompting Approaches**  
Zihan Wang\*, Tianle Wang\*, Dheeraj Mekala, Jingbo Shang  
*Findings of the Association for Computational Linguistics (ACL), 2023*
- Leveraging QA Datasets to Improve Generative Data Augmentation**  
Dheeraj Mekala, Tu Vu, Timo Schick, Jingbo Shang  
*Conference on Empirical Methods in Natural Language Processing (EMNLP), 2022*
- LOPS: Learning Order Inspired Pseudo-Label Selection for Weakly Supervised Text Classification**  
Dheeraj Mekala, Chengyu Dong, Jingbo Shang  
*Findings of the Conference on Empirical Methods in Natural Language Processing (EMNLP), 2022*
- Progressive Sentiment Analysis for Code-Switched Text Data**  
Sudhanshu Ranjan, Dheeraj Mekala, Jingbo Shang  
*Findings of the Conference on Empirical Methods in Natural Language Processing (EMNLP), 2022*
- Coarse2Fine: Fine-grained Text Classification on Coarsely-grained Annotated Data**  
Dheeraj Mekala, Varun Gangal, Jingbo Shang  
*Conference on Empirical Methods in Natural Language Processing (EMNLP), 2021*
- BFCClass: A Backdoor-free Text Classification Framework**  
Zichao Li\*, Dheeraj Mekala\*, Chengyu Dong, Jingbo Shang  
*Findings of the Conference on Empirical Methods in Natural Language Processing (EMNLP), 2021*
- XClass: Text Classification with Extremely Weak Supervision.**  
Zihan Wang, Dheeraj Mekala, Jingbo Shang  
*Conference of the North American Chapter of the Association for Computational Linguistics (NAACL), 2021 (Virtual Talk).*

10. **META: Metadata-Empowered Weak Supervision for Text Classification.**  
Dheeraj Mekala, Xinyang Zhang, Jingbo Shang  
*Conference on Empirical Methods in Natural Language Processing (EMNLP), 2020 (Virtual Talk).*
11. **Contextualized Weak Supervision for Text Classification.**  
Dheeraj Mekala, Jingbo Shang  
*Association for Computational Linguistics (ACL), 2020 (Virtual Talk).*
12. **User bias removal in review score prediction.**  
Rahul Wadbude\*, Vivek Gupta\*, Dheeraj Mekala, Harish Karnick.  
*ACM India Joint International Conference on Data Science and Management of Data (CODS/COMAD) 2018.*
13. **SCDV: Sparse Composite Document Vectors using soft clustering over distributional representations.**  
Dheeraj Mekala\*, Vivek Gupta\*, Bhargavi Paranjape, Harish Karnick.  
*Conference on Empirical Methods in Natural Language Processing (EMNLP), 2017 (Long Oral).*

## Preprints & Submissions

\* - equal contribution

1. **News Meets Microblog: A Retriever-Generator Hashtag Annotation Framework**  
Xiuwen Zheng\*, Dheeraj Mekala\*, Amarnath Gupta, Jingbo Shang  
(under review), 2021.
2. **Bayes-optimal Hierarchical Classification over Asymmetric Tree-Distance Loss**  
Dheeraj Mekala, Vivek Gupta, Purushottam Kar and Harish Karnick.  
*arXiv:1802.06771, 2018.*

## Theses

1. **Contextualized, Metadata-Empowered, Coarse-to-Fine Weakly-Supervised Text Classification.**  
Dheeraj Mekala and Jingbo Shang.  
*Masters Thesis, Computer Science and Engineering, UC San Diego, 2019 - 21.*

## WORK EXPERIENCE

### Meta AI Research

June 2023 - Sept 2023

Research Scientist Intern, FAIR Team

Collaborators: Jason Weston, Jack Lanchantin, Maria Lomeli, Roberta Raileanu, Jane Yu

- Worked on training large language models to use tools, focusing on OOD generalization to unseen tools.

### Microsoft Research Semantic Machines

June 2022 - Sept 2022

Research Intern, Semantic Machines

Collaborators: Dr. Jason Wolfe, Dr. Subhro Roy

- Decomposed zero-shot semantic parsing task into multiple abstractive and extractive QA problems.
- Designed a QA model that abstains from prediction when it is not confident.
- Our QA-based formulation outperforms existing zero-shot methods significantly.

### Amazon Science

June 2021 - Sept 2021

Applied Scientist Intern, Product Graph Team

Collaborators: Dr. Nasser Zalmout

- Designed a hybrid architecture for Open-world, closed-world and long tail Attribute Value extraction.
- The hybrid architecture consists of a tagger to handle open-world values and a classifier to handle implicit values.
- This hybrid architecture resulted in a significant improvement in recall.

### Sprinklr India Pvt. Ltd.

Apr 2018 - Jul 2019

Data Scientist, Machine Learning Team

- Architected and built Sprinklr AI's visual insights module, being used by over 1200 Sprinklr clients.
- Developed in-house computer vision models for visual sentiment, gender, age, and inappropriate content detection.
- Built a scalable system capable of running models over 500 million messages per day using Kafka and Elasticsearch.
- Developed a dockerized auto-scaling framework which is deployed in kubernetes for image classification.

### Sprinklr India Pvt. Ltd.

Jul 2017 - Apr 2018

Product Engineer, Paid Advertising Team

- Developed a centralized monitoring environment which gathers system metrics as well as docker run-time metrics.

- Developed an end-to-end pipeline that incorporated DoubleClick tracking in ads.
- Implemented core functionalities to improve the feature of importing, exporting ads.

## Microsoft India

May 2016 - Jul 2016

### Machine Learning Intern

- Built case routing system in Microsoft Dynamics CRM, which predicts the ideal assignment candidate for a case.
- Built a robust pipeline which connects Microsoft Dynamics CRM and Azure Machine Learning studio.

## ASnTech & Engineering Services

Dec 2015 - Jan 2015

### Software Engineering Intern

- Designed an algorithm to speed up search queries related to the location of the vehicle, from 120 sec to 5 sec.
- Designed an algorithm that dynamically analyses accelerometer data of a moving vehicle to identify outliers and driving style of the driver.

## PET PROJECTS

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### ISPO Assistant

June 2022 - Sept 2023

- Developed a privacy-preserving document-analyzing assistant for the [International Student Organization](#) (ISPO).
- End-to-end document annotation, model training, and model inference are built from scratch and locally hosted to ensure privacy.
- Reduced the document processing time for work permit approval from 1 day to 1 hour.

## SELECTED AWARDS AND HONORS

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- UCSD CSE Student Achievement Award for Excellence in Research. 2021
- Best Project Award in Graduate-level Statistical Natural language processing course. 2019
- Ranked in Top 0.5% in JEE Advanced (IIT-JEE) 2013 among 150,000 candidates 2013
- Ranked in Top 0.2% in JeeMains-BTech 2013 among 1,400,000 candidates 2013
- Bronze Medal and Certificate of Merit (Top 15 in India) for National Science Olympiad '13 2013
- Awarded KVPY Fellowship from Government of India. 2012

## TALKS

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- Panelist *Technical Limitations of ChatGPT: Present and Future* at San Diego SuperComputer Center.
- Interview on ETV (A Leading Indian news and entertainment cable television network) September 2021
- Guest lecture, Introduction to Data Mining - Prof. Jingbo Shang March 2021
- University of Utah Data Science Seminar September 2020

## PROFESSIONAL RESPONSIBILITIES

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- *Peer Reviews*: ARR{2021-present}, AAAI{2021,23}, NAACL{2021,22}, ACL{2021,22,23}, EMNLP{2021,22,23}
- *Graduate Teaching Assistantship* - Dept. of Computer Science and Engineering, UCSD
  - Introduction to Machine Learning - Prof. Jingbo Shang Spring'21,23
  - Introduction to Data Mining - Prof. Jingbo Shang Spring'20, Winter'21,22,23
  - Advanced Data-Driven Text Mining - Prof. Jingbo Shang Fall 2020
  - TA Lead on Remote Teaching Summer 2020
  - Mathematics for Algorithms and Systems Analysis - Prof. Oliver Braun Summer 2020
  - Introduction to Programming in Java - Prof. Adalbert Gerald Soosai Raj Winter 2020
- *Mentorship*
  - Students
    - \* Adithya Samavedhi [C.2]  
MS student, UCSD CSE 2022 -
    - \* Alex Nguyen  
BS student, UCSD CSE 2022 -

- \* Bryant Tan  
BS student, UCSD CSE 2022 -
- \* Gilen Wu-Hou  
BS student, UCSD CSE 2022 -
- \* Jinya Jiang  
BS student, UCSD CSE 2022 -
- \* [Sudhanshu Ranjan](#) [C.6]  
MS student, UCSD CSE → Software Engineer, Health at Scale 2021
- *Regional Academic Mentor* - Dept. of Computer Science and Engineering, IIT Kanpur 2014 - 2015
- *Student Guide* - IIT Kanpur 2014 - 2015