AVINASH MADASU

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EDUCATION

Master of Science, Computer Science — August 2021 - May 2023
University of North Carolina at Chapel Hill

Bachelor of Technology, Computer Science — July 2014 - May 2018
National Institute of Technology Tiruchirappalli

EXPERIENCE

Intel Labs — **June 2023 - present**
AI Research Scientist

- Investigated context engineering strategies for maximizing the performance of enterprise agentic systems deployed on Intel hardware.
- Pioneered a novel multimodal Chain-of-Thought (CoT) reasoning approach, leveraging synthetic data generation to substantially improve performance in complex reasoning models. Published at AAAI 2026.
- Developed a novel interpretability framework for CLIP models; empirically identified that a shared subset of attention heads governs both downstream performance and the emergence of social biases. Selected as an oral paper at EMNLP 2025 by Senior Area Chairs.
- Created and published the first benchmark "SocialCounterFactuals" in CVPR 2024 to evaluate and de-bias intersectional biases in vision-language models which reduced existing biases by >20%.

Intel Labs — **May 2022 - Aug 2022**
Research intern

- Spearheaded the project "Improving Multi-modal Video Retrieval Using Multi-lingual Data" from ideation to prototype, model development, and paper writing.
- Published in ECIR 2023, a top Information Retrieval conference, and won the Best Student Paper Award and also the first work to leverage the Gaudi AI accelerator.

UNC Chapel Hill — **August 2021 - Present**
Graduate Research Assistant — Advisor: Prof. Gedas Bertasius

- Proposed a new interactive video retrieval system that leverages dialog with the users. The proposed approach requires minimum rounds of dialog to outperform the human dialog. The paper was published in ACM Multimedia 2022.
- Proposed interactive system outperformed static video retrieval models by 2.8 points in R@1 and 10 points in R@5. This system is the first to use generative models (BART, T5) to perform open ended dialog with the users.

UNC Chapel Hill — **August 2021 - November 2021**
Graduate Research Assistant — Advisor: Prof. Shashank Srivastava

- Explored the inductive biases in pre-trained language models for solving non-linguistic reasoning tasks.
- Proposed a set of 19 diverse non-linguistic tasks involving quantitative computations, recognizing regular expressions and reasoning over strings and published this work in EMNLP 2022.

Samsung R&D Institute India - Bangalore — **June 2018 - July 2021**
Senior Software Engineer on Bixby NLU

- Developed and deployed named entity recognition models in compliance with GDPR to identify user sensitive information like phone number, name, bank details etc. This model scaled to billions of user data and was deployed globally in samsung with access to sensitive information.
- Built a model which identifies utterance executed in a wrong application. This model is built with triplet loss and with a very less data of 150 samples for each application. This model identified misclassified utterances with 90% accuracy and across 10 applications.
- Collaborated with different product, engineering teams of Bixby globally (eg: korea, USA) for successful integration of AI models into samsung products.

IIT Patna **July 2020 - January 2021**
Research Assistant Advisor: Prof. Asif Eqbal

- Proposed an End-to-End model capable of identifying slots from user utterances without external slot labels. This paper was accepted in the journal Multimedia Tools and Applications.
- Published one of the earliest works to use large scale pretraining in dialog systems which significantly improved slot identification accuracy and dialog generation.

National Institute of Technology, Tiruchirappalli **July 2017 - May 2018**
Research Assistant Advisor: Prof. Sivasankar

- Designed efficient lexicon based feature selection techniques that achieved excellent performance in resource scarce conditions. This work was published in the journal of multimedia tools and applications (> 80 citations).
- Conducted a systemtic study on the advantages and disadvantages of statistical feature selection techniques vs neural network techniques (word2vec, Doc2vec). This work garnered more than 60 citations.
- Explored the possibility of combining text reviews with numerical ratings to design a hybrid recommender system.

PUBLICATIONS

1. Learning from Reasoning Failures via Synthetic Data Generation
   Gabriela Ben Melech Stan, Estelle Aflalo, **Avinash Madasu**, Vasudev Lal, Phillip Howard
   AAAI 2026

2. Pruning the Paradox: How CLIP's Most Informative Heads Enhance Performance While Amplifying Bias
   Avinash Madasu, Vasudev Lal, Phillip Howard
   EMNLP 2025 (Oral) (Senior Area Chair Recommendation)

3. Is Your Paper Being Reviewed by an LLM? Investigating AI Text Detectability in Peer Review
   Sungduk Yu, Man Luo, **Avinash Madasu**, Vasudev Lal, Phillip Howard
   NeurIPS (Safe Generative AI Workshop) 2024, ICLR 2026 (Under review)

4. Affective Visual Dialog: A Large-Scale Benchmark for Emotional Reasoning Based on Visually Grounded Conversations
   Kilichbek Haydarov, Xiaoqian Shen, **Avinash Madasu**, Mahmoud Salem, Jia Li, Gamaleldin Elsayed, Mohamed Elhoseiny
   ECCV 2024

5. Probing and Mitigating Intersectional Social Biases in Vision-Language Models with Counterfactual Examples
   Phillip Howard, **Avinash Madasu**, Tiep Le, Gustavo Lujan Moreno, Anahita Bhiwandiwalla, Vasudev Lal
   CVPR 2024

6. ICSVR: Investigating Compositional and Syntactic Understanding in Video Retrieval Models
Avinash Madasu, Vasudev Lal
CVPR (MMFM workshop) 2024

7. Analyzing Zero-Shot Abilities of Vision-Language Models on Video Understanding Tasks
Avinash Madasu, Anahita Bhiwandiwalla, Vasudev Lal
NeurIPS (R0-FoMo workshop) 2023

8. Probing Intersectional Biases in Vision-Language Models with Counterfactual Examples
Phillip Howard, **Avinash Madasu**, Tiep Le, Gustavo Lujan Moreno, Vasudev Lal
NeurIPS (Diffusion models workshop) 2023

9. MuMUR: Multilingual Multimodal Universal Retrieval
Avinash Madasu, Estelle Guez Aflalo, Gabriela Ben Melech Stan, Shachar Rosenman, Shao-Yen Tseng, Gedas Bertasius, Vasudev Lal
Information Retrieval Journal

10. A Unified Framework for Slot based Response Generation in a Multimodal Dialogue System
Mauajama Firdaus*, **Avinash Madasu***, Asif Eqbal
Journal of Multimedia Tools and Applications

11. Is Multi-Modal Vision Supervision Beneficial to Language?
Avinash Madasu, Vasudev Lal
CVPR (NFVLR workshop) 2023

12. A Unified Framework for Emotion Identification and Generation in Dialogues
Avinash Madasu*, Mauajama Firdaus*, Asif Eqbal
EACL (SRW workshop) 2023

13. Improving video retrieval using multilingual knowledge transfer
Avinash Madasu, Estelle Guez Aflalo, Gabriela Ben Melech Stan, Shao-Yen Tseng, Gedas Bertasius, Vasudev Lal
ECIR 2023 (Best Student Paper Award)

14. What do Large Language Models Learn beyond Language?
Avinash Madasu, Shashank Srivastava
EMNLP (Findings) 2022

15. Learning to Retrieve Videos by Asking Questions
Avinash Madasu, Junier Oliva, Gedas Bertasius
ACM Multimedia 2022

16. Sequential Domain Adaptation through Elastic Weight Consolidation for Sentiment Analysis
Avinash Madasu, Vijjini Anvesh Rao
ICPR 2020

17. A Position Aware Decay Weighted Network for Aspect based Sentiment Analysis
Avinash Madasu, Vijjini Anvesh Rao
NLDB 2020

18. Sequential Learning of Convolutional Features for Effective Text Classification
Avinash Madasu, Vijjini Anvesh Rao
EMNLP 2019

19. Efficient Feature Selection techniques for Sentiment Analysis
Avinash Madasu, Sivasankar E
Journal of Multimedia Tools and Applications

20. Gated Convolutional Neural Networks for Domain Adaptation
Avinash Madasu, Vijjini Anvesh Rao
NLDB 2019

21. Effectiveness of Self Normalizing Neural Networks for Text Classification
Avinash Madasu, Vijjini Anvesh Rao
CICLing 2019

22. A Study of Feature Extraction techniques for Sentiment Analysis
Avinash Madasu, Sivasankar E
IEMIS 2018

PREPRINTS

1. Multimodal Dialogue Modeling: Simultaneous Intent Recognition and Response Generation
Avinash Madasu*, Mauajama Firdaus*, Asif Ekbal

VOLUNTEER EXPERIENCE

Conference Reviewer: ICCV 2025, EMNLP 2025, COLM 2024, CVPR 2024, ICLR 2024, AAAI 2024, EMNLP 2023, AMLC 2023, NeurIPS 2023, BMVC 2023, CoLLA 2023, ACL 2023, CVPR 2023, EACL 2023, ACL 2022, ACL 2021, ICON 2020
Journal Reviewer: Machine learning, TMLR, Computer Speech & Language
Workshop Reviewer: ICLR - MoFo 2023, ICLR - MRL 2023, SocialNLP

PRESS

- The Jerusalem Post
- Outlook India
- Analytics India Magazine

AWARDS

- Outstanding reviewer - ACL 2023
- Best Student Paper Award - ECIR 2023.
- ACM grant to attend ACM Multimedia 2022 conference.
- Samsung Citizen Award 2019, 2020 (Research) (4/9000).

OPEN SOURCE DEEP LEARNING FRAMEWORKS CONTRIBUTIONS

- gluonnlp (Contributor and Member of Distributed Machine Learning Community- dmlc).
- serve
- pytorch-optimizer.
- catalyst
- AllenNLP

RELEVANT LINKS

- Google Scholar: https://scholar.google.com/citations?user=YReOruYAAAAJ&hl=en
- DBLP: https://dblp.org/pid/241/5153.html
- Semantic Scholar: https://www.semanticscholar.org/author/Avinash-Madasu/115098946
- ORCID iD: https://orcid.org/0000-0002-3802-7618