MONA GANDHI

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Education

2024-Present **PhD CSE at The Ohio State University**.
PhD in Computer Science
- *Coursework*: Data Visualization, Advanced NLP.

2022-2024 **MS CIS at University of Pennsylvania**, *GPA: 3.90/4*.
Masters in Computer and Information Science
- *Coursework*: Artificial Intelligence, Natural Language Processing, Machine Learning, Analysis of Algorithms, Database Management Systems, Computer Vision, Network Systems.

2018-2022 **B.Tech CS at Veermata Jijabai Technological Institute**, *GPA: 9/10*.
Bachelors in Computer Science
- *Coursework*: Operating System, Machine Learning, Database Management Systems, Data Interpretation and Analysis, Web Technologies, Software Engineering, Cloud Computing, Wireless Networks, Network Security.

Publications and Presentations

NeurIPS 2024 **A Textbook Remedy for Domain Shifts: Knowledge Priors for Medical Image Analysis**, Yue Yang, **Mona Gandhi**, Yufei Wang, Yifan Wu, Michael S. Yao, Chris Callison-Burch, James C. Gee, Mark Yatskar.
The Annual Conference on Neural Information Processing Systems, 2024

CVPR 2023 **CREPE: Can Vision-Language Foundation Models Reason Compositionally?**, Zixian Ma*, Jerry Hong*, Mustafa Omer Gul*, **Mona Gandhi**, Irena Gao, Ranjay Krishna.
IEEE Conference on Computer Vision and Pattern Recognition, 2023, **highlight**

CVPR 2022 **Measuring Compositional Consistency for Video Question Answering**, **Mona Gandhi***, Mustafa Omer Gul*, Eva Prakash, Madeleine Grunde-McLaughlin, Ranjay Krishna, Maneesh Agrawala.
IEEE Conference on Computer Vision and Pattern Recognition, 2022

Selected Research Experience

2023-2024 **Interpretable Radiology**, *University of Pennsylvania*.
- *Mentor*: Prof. Mark Yatskar
- *Domain*: Computer Vision and Natural Language Processing
- *Work*: Building an interpretable concept bottleneck model inspired by LaBo for the medical domain, specifically chest X-rays, for assisting radiologists in analysing them with natural language explanations in the form of concepts supporting the final model output.

2022-2023 **Compositionality of Vision Language models**, *University of Washington*.
- *Mentor*: Prof. Ranjay Krishna
- *Domain*: Computer Vision and Natural Language Processing
- *Publication*: IEEE CVPR 2023, **Highlight paper**
- *Work*: Examined huge vision-language models (CLIP) on two major aspects of compositionally: systematicity and productivity by introducing a new benchmark called CREPE. Found that these huge models even though they excel at very complex tasks, fail to understand compositionally.

2021-2022 **Question Decomposition**, *Stanford University*.
- *Mentors*: Prof. Maneesh Agrawala, Prof. Ranjay Krishna
- *Domain*: Computer Vision and Natural Language Processing
- *Publication*: IEEE CVPR 2022
- *Work*: Developed a question decomposition engine that deconstructs a compositional question from AGQA into a subquestion hierarchy, a directed acyclic graph. Evaluated the performance of HCRN and HME models using consistency metrics on subquestion hierarchies for the AGQA dataset and learnt that easier subquestions are incorrect while complex questions are answered correctly.

Recent Projects

2024 **Examining the Reversal Curse on GPT models**.
- *Technologies*: Computer Vision, LLMs
- *Description*: The Reversal Curse paper (link) highlights a simple task that these models fail at. If the model has seen "A is B", it is not guaranteed that the model can generalize "B is A" - this is coined as Reversal Curse in the paper. In addition to replicating the results from the paper, we investigate the model on a verification task, where the model is asked a yes-no question. The model struggles to respond to these questions and even contradicts itself within the same response.

2023 **AutoArt**, *Neural Style Transfer*.
- *Technologies*: Computer Vision, Deep Learning
- *Course*: Computer Vision, CIS 5810
- *Description*: Implemented two novel methods to improve our outputs for neural style transfer: (i) fine-tuning the model as a classification for a particular style, and (ii) flattening the layers to allow us the convenience of adding style and content loss inside the blocks. Concluded that mobilenetv2 with flattening with a fine-tuned model gave the best visual results.

2023 **Live Poets Society**, *Goodreads clone*.
- *Technologies*: ReactJS, MySQL
- *Course*: Database Management System, CIS 5500
- *Description*: Created a social cataloguing application specifically for poetry lovers, that enables users to explore the world of poetry through an extensive collection of books, series, authors, and reviews.

2022 **Could this be any better?**, *Multimodal Sarcasm Detector*.
- *Domain*: Computer Vision and Natural Language Processing
- *Course*: Natural Language Processing, CIS 5300
- *Description*: Implemented a multimodal sarcasm detector using video, audio, and text features from the MUStARD dataset. Trained and analysed the performance of LSTMs with different types of attention. Concluded that the best-performing model learns a bias towards labelling data as sarcastic, but it does very well in detecting non-sarcastic data.

Teaching Experience

Graduate Teaching Assistant

2024 **CIS 4000/4010: Senior Design Project**.
2024 Spring: instructed by Prof. Boon Thau Loo
2023 Fall: instructed by Prof. Boon Thau Loo
2023 Spring: instructed by Prof. Jonathan M. Smith
- Mentoring and managing five teams of undergraduate students for their senior design project, helping them plan their weekly goals and giving feedback and suggestions.

2023 **CIS 5300: Natural Language Processing**.
2023 Summer: instructed by Prof. Chris Callison-Burch
2023 Fall: instructed by Prof. Mark Yatskar

Technical Skills

Languages	Python, C++, C, Java, SQL
DL Tools	Pytorch, Tensorflow, OpenCV, Hugging Face
Web-Dev	HTML, CSS, Javascript, PHP, React JS, NodeJS, Oracle DB, Mongo DB
Others	Linux, Visual Studio, Git

Achievements

2024 Received an outstanding teaching award at UPenn.

2018 1^{st} rank among girls and 10^{th} rank overall in MHT-CET (state-level entrance exam) among 280 thousand students.

2008-2020 Pursued Visharath Pratham (highest level of degree in Indian Classical Dance) in Bharatnatyam (Indian Classical Dance) and performed Araangetram (first stage performance).