Mallikarjuna **Tupakula**

Website | E-mail | Github | Twitter | LinkedIn

Education

R.V.R. & J.C. College of Engineering, Guntur, India **2016 - 2020**
Bachelor of Technology in *Computer Science and Engineering*

Research Experience

Indian School of Business, Hyderabad, India [🌐] **Dec 2020 - Present**
Research Assistant | Advisor : Prof. Sumeet Kumar

- Representative list of projects delivered:
  - Finding Product Placement in YouTube Videos
  - Rating the Language Appropriateness of Children's Videos on YouTube
  - A Multi-Modal Approach to Study Gender Stereotypes in Kids' Videos
  - Quantifying the Educational Quality of Kids' Videos using Machine Comprehension
  - How brand promotions have evolved in kids videos?
  - Block Ryan's Toys Reviews? The Perils of Implicit Advertisements on YouTube for Kids
- Guided summer interns in their projects with identification of resources and troubleshooting coding issues, handling servers, creation of large datasets in terms of Tera Bytes from YouTube, Amazon and Twitter.

Spacept, Stockholm (Remote), Sweden [🌐] **Aug 2020 - Nov 2020**
Machine Learning (ML) Intern | Advisor: Sergiu Iliev (Founder)

- Built a ML model for oil spills around **Mauritius Island** using Satellite images collected from Google Earth Engine
- Demonstrated Deep Learning concepts to new interns, including how machine learning models classify oil-spill vs normal satellite images

Indian Institute of Technology Madras, Chennai [🌐] **Dec 2019 - Mar 2020**
Research Intern | Advisor : Prof. Srinivasa Chakravarthy

- Worked with the Neuromotive team on writing research paper abstracts
- Received on-the-job training on medical imaging and performed initial exploration on CT scan image reconstruction problem.
- Updated the *bharatiscript* web page with new content

Indian Institute of Management Bangalore, Bangalore[🌐] **May 2019 - July 2019**
Research Intern | Advisors: Prof. Trilochan Sastry, Mr. Shubh Patodi, Mr. Shivam Shukla

- Worked in collaboration with *Farmveda* on analyzing sales data, along with being involved with the Digital Marketing team for promotion of products on social media
- Conducted a survey based research assignment on villages to study how *Center for Collective Development* (CCD) helps farmers to get products to Market by limiting profits for the intermediaries

Publications

Gender Stereotyping in Popular Children's Videos
Tiasa Singha Roy, Mallikarjuna Tupakula, Sumeet Kumar, Ashique KhudaBukhsh
Annual Conference of the Association for Computational Linguistics **(ACL SRW'23)**

Examining Gender Biases and Stereotyping in Popular Children's Videos
Sumeet Kumar, Mallikarjuna Tupakula, Ashique KhudaBukhsh

Proceedings of the National Academy of Sciences **(submitted to PNAS)**

Quantifying the Educational Quality of Kids' Videos using Machine Comprehension
Sumeet Kumar, Mallikarjuna Tupakula, Ashique KhudaBukhsh
INFORMS Journal on Computing (**Under review, has received Revise and Resubmit**)

Rating the Language Appropriateness of Children's Videos on YouTube
Mallikarjuna Tupakula, Sumeet Kumar, Ashique KhudaBukhsh
IEEE Transactions on Knowledge and Data Engineering (**submitted to IEEE TKDE**)

Anonymous Dissent in the Digital Age: A YouTube Dislikes Dataset
Sujan Dutta, Mallikarjuna Tupakula, Sumeet Kumar, Ashique KhudaBukhsh

Awards and Honors

- Awarded Kathuria Pre-Doctoral Scholarship from Shri Nihal Chand Kathuria Education Trust for showing excellence in pre-doctorialship at Indian School of Business. **January 21, 2023**
- Awarded full scholarship for undergraduate studies in lieu of exceptional performance in the entrance examination and prior academic record. **June 20, 2016 - April 18, 2020**
- Awarded Highly Competitive and Prestigious Facebook AI Scholarship. **September 13, 2019**

Teaching

- Teaching Assistant - Advanced Qualitative Research Analysis (executive Ph.D.), Indian School of Business. **Spring, 2024**

Research Projects

Rating the Language Appropriateness of Children's Videos on YouTube
Advisor: Prof. Sumeet Kumar, Prof. Ashique KhudaBukhsh

- There is no prior work that has been worked on the language rating of the kids videos where these videos contain inappropriate words, that cause children to learn these kinds of words.
- I built a multi-task machine learning model by modifying the architecture of the **BART** model, where it returns language rating and language summarization.
- Created a new dataset to build a machine learning model from scratch by web scraping the data from **Kids-In-Mind**.

Block Ryan's Toys Reviews? The Perils of Implicit Advertisements on YouTube for Kids
Advisor: Prof. Sumeet Kumar, Prof. Vandith Pamuru, Prof. Deepa Mani

- Product placements in Youtube videos influence sales rank on e-commerce platforms like Amazon.
- Used selenium library to scrape data from Amazon; google api to collect data for top 100 channels based on their popularity and subscription count.
- Performed analysis on changes in product rankings on Amazon, focusing on the aftermath of the launch of YouTube's policy on prohibition of advertisements on YouTube Kids.

Finding Product Placement in YouTube Videos
Advisor: Prof. Sumeet Kumar

- Advertising products in YouTube Kids' is a violation of the platform policy. Some content creators continue to advertise products implicitly.
- Scrapped youtube video frames containing product titles from over 1900 videos by Ryan's world; used AWS transcripts to perform name matching for these products with product titles extracted from Amazon.
- I have developed an algorithm to find the relevant picture frames from youtube videos based on the product title from Amazon and approached the problem by applying different ML algorithms.

A Multi-Modal Approach to Study Gender Stereotypes in Kids' Videos

Advisor: Prof. Sumeet Kumar, Prof. Ashique KhudaBukhsh

- Gender-biases related to occupations perpetuated by videos targeted at kids influences children's decision-making regarding their career choices.
- Processed 5000 YouTube videos related to kids from the 28 channels, isolating terms related to occupations through AWS transcripts, using RetinaFace model to capture frames connected to the use of these terms, followed by using MTCNN model to detect and classify faces based on gender. This information was used to calculate the gender-bias in these videos by calculating RIPA values for each occupation based on AWS transcripts.
- I have written a script to process 15000 videos related to kids to capture occupation picture frames from these videos, followed by detection and classification of gender based on faces in the captured images.

Quantifying the Educational Quality of Kids' Videos using Machine Comprehension

Advisor: Prof. Sumeet Kumar, Prof. Ashique KhudaBukhsh

- Everyday hundreds of videos are posted on youtube related to kids content. Prior studies have not looked into the quality of education associated with such videos.
- I have written a script which uses vectorization, multithreading and efficient utilization of GPU resources for processing of 80K+ videos from 100 different channels for getting captions from the video for every 15 seconds as well as getting youtube generated transcript for the same.
- I also built an ML pipeline using Machine Reading Comprehension (MRC) Model, to assess the amount of educational content present in these videos based on the TQA dataset questions.

The Impact of COPPA policy on the Presence of Brands in YouTube Kids' Videos

Advisor: Prof. Sumeet Kumar, Prof. Deepa Mani

- Promotions in the youtube videos have changed over time especially after the COPPA policy which prohibits ***made for kids*** videos from promoting any products, but content creators continue to promote products in their videos.
- I was involved in analyzing the description of 50,000 videos from the 130 top channels related to kids to assess how advertisements and promotions have evolved after the change in Youtube's policy on kids related videos.
- I have also built a machine learning model to distinguish videos based on usage of explicit and implicit promotional content.

Skills

Programming	**Python, C/C++, MATLAB, Java, HTML**
Frameworks	**PyTorch, Numpy, OpenCV, selenium, pandas, numpy, scikit-learn**
Relevant Coursework	**Deep Learning, Computer Vision, Machine Learning, Probability and Statistics, Linear Algebra and Differential Equations**

Academic Service & Volunteering

- Volunteered for the Graduation Ceremony at Indian School of Business for the academic year 2022-23.
- Volunteered for the AI4ALL organization as a mentor to high school students based out of the United States and Canada to guide them in their projects involving AI.
- Served as a volunteer for a job fair and during tech fest during undergraduate studies at my college.