Tejas Agrawal

tej-55.github.io

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Education

- **BITS Pilani K K Birla Goa Campus** — Goa, India
  B.E.(hons.) - Electrical and Electronics Engineering; Minor in Data Science; CGPA: 8.12 — *2021 - 2025*
  Courses: *Machine Learning, Large Language Models, Foundations of Data Science, Optimization, Deep Learning*
- **Shiv Jyoti International** — Kota, India
  Class 12th CBSE; Percentage: 90.4% — *2021*
- **Mount Litera Zee School** — Gwalior, India
  Class 10th CBSE; Percentage: 94.6% — *2019*

Skills Summary

- **Machine Learning**: Python, Regression, Boosting, Random Forests, Clustering, SVM
- **Frameworks**: Scikit-learn, TensorFlow, PyTorch, Keras, Hugging Face, LangChain, ESPNet
- **Deep Learning**: Multilayer Perceptron, Convolutional Neural Networks (CNN), Graph Neural Networks (GNN)
- **Natural Language Processing**: Transformers, LSTM, Attention Mechanism, BERT, GPT family, LLaMA family

Experience

- **CSE Department, IIT Bombay** — Mumbai, India
  Research Intern — *May 2024 - Present*
  - Advancing Automatic Speech Recognition (ASR) systems for low-resource accented speech
- **APPCAIR** — Goa, India
  Student Researcher — *July 2023 - May 2024*
  - Worked under the guidance of Prof. Ashwin Srinivasan, Dr. Lovekesh Vig and Dr. Gautam Shroff
  - Studied and analyzed the performance of LLM's ability to reason over arguments
  - Currently, working on the extension of CRMs, a form of 'explainable neural networks'.

Projects

- **CountCLIP** [Link]:
  - Reproducing ICCV 2023 paper Teaching CLIP to Count to Ten to improve quantitative understanding of objects in VLMs
  - Making the implementation accessible for future researchers
  - Collected specialized dataset to facilitate the training
- **Rank-N-Contrast for graphs** [Link]:
  - Reproduction of the NeurIPS 2023 Spotlight Rank-N-Contrast
  - Evaluating it's performance in graph regression tasks
- **Albert with Perceiver layers** [Link]:
  - Implemented the Albert model to compare its performance when employing the Perceiver layers as compared to the standard Transformer layers
  - Pre-trained both models over the same corpus and evaluated through fine-tuning for the downstream task of Paraphrasing using the MSR corpus
- **Code-Mixed Sentence Generation and Language Model Fine-Tuning** [Link]:
  - Examined code-mixed sentences with non-formal language for abuse detection
  - Fine-tuned pre-trained language models (BeRT and m-BeRT) to categorize code-mixed sentences and assess their performance
  - Compared LLM performance based on code-mixing indices (CMI) and model accuracy, addressing challenges in code-mixed language processing
- **Zero Shot Image Segmentation using CLIP** [Link]:
  - Enabled text-guided image segmentation using CLIP's text-image embeddings for diverse object segmentation
  - Multimodularity associates text prompts with images, producing embeddings for binary segmentation decoder training
  - Used a contrastive loss to match ground truth segmentation maps
- **Variations of Softmax** [Link]:
  - Analyzed how various Softmax variants affect both model performance and training time, evaluating them on large-class classification tasks
  - Explores the trade-offs between computational complexity and model accuracy to enhance computational efficiency

Volunteer

- **SAiDL**: Member in SAiDL (total of 11 members). Volunteered as an instructor for two students-led Courses: Intro to ML, and Intro to DL .

Courses

- Stanford's CS231, CS224N, CS224W, CS229; Coursera's Deep Learning Specialisation