Thanmay Jayakumar

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EDUCATION

VISVESVARAYA NATIONAL INSTITUTE OF TECHNOLOGY Nagpur, India | 2019 - 2023
(B.Tech) Electronics & Communication Engineering

GLOBAL INDIAN INTERNATIONAL SCHOOL
Singapore | 2019

COURSEWORK

- Generative AI with Large Language Models [Cert.]
- NVIDIA's Building Transformer-Based Natural Language Processing (NLP) Applications [Cert.]
- IIIT-Hyderabad's Summer School on NLP [Cert.]
- Stanford CS224n: NLP with DL [Course]
- IIT-Madras CS6910: Deep Learning [Course]
- CS6370: Natural Language Processing
- NVIDIA's Fundamentals of Deep Learning [Cert.]
- Convolutional Neural Networks [Course]
- Data Structures and Algorithms [Cert.]
- Databases and SQL • Operating Systems
- Linear Algebra • Numerics and Probability

SKILLS

PROGRAMMING LANGUAGES
• Python • C • C++ • MATLAB • Perl (basic)

LIBRARIES
• PyTorch • Tensorflow • NumPy • SciPy • Pandas

SOFTWARE/TOOLS
• Git • Bash • MS Office • Adobe Photoshop
• LaTeX • HuggingFace • **OS:** Linux, Windows

LANGUAGES

Fluent	English, Tamil, Hindi, Telugu
Intermediate	German, Malayalam, Kannada
Elementary	Chinese, Sanskrit, Indonesian

EXTRACURRICULARS

- **Workshop Coordinator:** Organized and taught various IEEE workshops on Data Science.
- **Treasurer:** Responsible for handling the financial transactions for technical events under the IEEE VNIT Student Chapter Nagpur.
- **Graphic Designer:** Member of the Magazine & Literary Club, VNIT Nagpur.
- **Piano & Music Theory:** Grade 5 - Associated Board of the Royal Schools of Music (ABRSM).

OPEN-SOURCE WORK

- Research Paper Notes [HackMD]
- Research Paper Implementations [GitHub]

EXPERIENCE

AI4BHARAT, IIT MADRAS
Sep 2023 - Present

AI Resident ***Advisors:*** *Professors* R Dabre , A Kunchukuttan , M Khapra

- Research on developing multilingual LLMs for Indic languages.
- Experience with instruction-tuning, RLHF, Adapters, PEFT.
- Released *"Airavata"*, a Hindi instruction-tuned LLM. [Tech. Report]

IIT KANPUR
May - Aug 2022

Research Intern (SURGE 2022 Intern) ***Advisor:*** *Prof* Vipul Arora

- Aimed at solving the task of Spoken Term Detection (STD) to retrieve queried speech files in an audio database.
- Implemented three different approaches to STD for query localization, classification and location suggestion in a database.
- Analyzed an optimal combination of the above, in order to work towards building a language-agnostic system.

PUBLICATIONS

1. [Paper] Fauzan Farooqui, **Thanmay Jayakumar**, Pulkit Mathur, Mansi Radke, *"Leveraging Linguistically Enhanced Embeddings for Open Information Extraction"* (LREC-COLING 2024)
2. [Paper] **Thanmay Jayakumar**, Fauzan Farooqui, Luqman Farooqui, *"Large Language Models are legal but they are not: Making the case for a powerful LegalLLM"* (NLLP, EMNLP 2023)
3. [Paper] Kshitij Ambilduke, **Thanmay Jayakumar**, Luqman Farooqui, Himanshu Padole, Anamika Singh, *"Attending to Transforms: A Survey on Transformer based Image Captioning"* (PCEMS 2023)
4. [Paper in review] Aimed at extending the capabilities of LLMs (Llama2-7b) to the languages written in non-Latin scripts. (A*)

SELECTED PROJECTS

DEEP LEARNING NEURAL NETWORKS

- **Distributed Processing and Sharding:** [GitHub]
  Deployed PyTorch's Distributed Data Parallel and Fully Sharded Data Parallel with RoBERTa on a two-GPU parallelism.
- **Neural Networks from Scratch:** [GitHub]
  Implemented multiple neural networks from scratch using PyTorch and NumPy. Demonstrated strong understanding of deep learning principles and the ability to work with complex architectures.

TEXT-BASED GENERATIVE MODELING

- **Image Captioning:** [GitHub]
  Surveyed image captioning methods for our bachelors thesis and trained captioning models with a ResNet image encoder and various decoders in PyTorch using the Flickr caption dataset.
- **Neural Machine Translation:** [GitHub]
  Implemented Encoder-Decoder architectures from scratch in PyTorch using the Multi30k Dataset for German-English. Reviewed the literature low-resource scenarios. [Slides] [Notes]
- **Statistical Machine Translation:** [Presentation]
  Investigated the effects of tuning on different evaluation metrics. Presented at the IIIT Hyderabad Advanced NLP Summer School.