Anirudh S / EE18B073
Indian Institute of Technology Madras
anirudhsriram30799@gmail.com +919789898810
Personal Website: https://anirudhs123.github.io/Personal-Site-Anirudh-S/ Github Profile: https://github.com/anirudhs123

EDUCATION

Program	Institution	% / CGPA	Completion
B.Tech (Hons.) Electrical Engineering	Indian Institute of Technology Madras	9.77	2022
XII (CBSE)	Chettinad Vidyashram, Chennai	97.8%	2017
X (CBSE)	Sir Siva Swami Kalalaya Sr. Secondary School, Chennai	10.0	2015

SCHOLASTIC ACHIEVEMENTS

Secured rank among top 1 % out of 10,000 applicants in KVPY 2017, offered admission to IISC with fellowship	2017
B.Tech Electrical Engineering branch topper	2019-21*
Awarded **'Young Achiever- 2017'** for All-round excellence in Academics and Extracurricular by Chettinad Vidyashram.	2017
Secured **'Gold'** in 9th Inter IIT Tech Meet organized by IIT Guwhati, representing IIT Madras Analytics team in **"Scalathon: Build an Automatic Headline and Sentiment Generator".**	2021

PUBLICATIONS

Gesture recognition from swipe keyboard for Indic languages

[JAN 2020-JUN 2020]

Project Guide: Prof. Mitesh Khapra and Prof. Pratyush Kumar Panda - **IIT Madras**

- Used a **LSTM** and **transformer** with multi head attention based model trained on **CTC Loss** function for input gesture recognition.
- Transliterated the decode gesture input into an Indic word using a **LSTM** based encoder-decoder model with **Bahadanu Attention** and a **Beam Search Decoder.**
- The transliterated Indic word was then passed into contrastive spell correction module based on **ELMO Embedding** to obtain the corresponding spell corrected Indic word.

This work has been published in COLING (Computational Linguistics) 2020 Conference.
Link to paper: https://www.aclweb.org/anthology/2020.coling-main.87
Project Website : https://github.com/anirudhs123/Indic-Swipe

Transductive Transfer learning based LSTM-CNN model for Thermal comfort prediction

[AUG 2020- DEC 2020]

Project Guide : Prof. Krithivasan Ramamritham & Dr. Nivethitha Somu – **IIT Bombay**

- Built a **transductive transfer learning** based **LSTM-CNN** model to predict thermal comfort in a region with very less or **no labeled data**.
- Used **SMOTE** (Synthetic minority oversampling technique) to generate synthetic samples in order to handle the inherent imbalance in the source domain dataset.
- Used **Chi2 test** and **Pearson Correlation coefficient** to carry out feature selection from the source dataset to arrive at the most significant 8 features from a dataset comprising of more than 100 features.

This work has been accepted in Elsevier – Buildings and Environment Journal
Link : https://www.sciencedirect.com/science/article/abs/pii/S0360132321005345
Project Website (On Github) : https://tinyurl.com/wdawkp3v

Input Specific Attention Subnetworks for Adversarial Detection

[JAN 2021- JUL 2021]

Project Guide : Prof. Mitesh Khapra and Prof. Pratyush Kumar Panda - **IIT Madras**

- Built a novel adversarial detection model based on novel features formed from the attention heads of the Transformer model. The Input specific attention subnetworks were used for extracting the features used to discriminate between authentic and adversarial inputs.
- The resultant detector significantly improves (by over 10%) the state-of-the-art adversarial detection accuracy for the BERT encoder on 10 NLU datasets with 11 different adversarial attack types.

This work has been submitted to ACL Rolling review 2021 [September edition]
Link : Will be added after the Anonymity Period
Project Website (On Github) : https://tinyurl.com/5bj8kru7

PROJECTS AND INTERNSHIPS

Shared Disk Data Tracking for a failover cluster

[MAY 2021-JUL 2021]

Summer internship at: **Microsoft India (R&D) Pvt. Ltd**
Team : Cloud & Artificial Intelligence
Role : Software Engineer Intern

- Worked on Control plane changes to report shared disk in context of one node and Data path changes to report all IOs in context of one node.
- Wrote a script to automatically detach the shared disk from owner node and reattach the disk in all the nodes which are part of the cluster before failovering to the target side.
- Verified the Tag generation and Crash consistent RPO generation in context of

	single node on the Azure portal
Neural Embedding and Bi-Partite Graph based Recommender system [MAY 2020-JUL 2020]	Summer internship at: **BRIDGEI2I ANALYTICS SOLUTIONS PVT. LTD.** • Built a whole pipeline of recommender systems comprising of **Popularity recommender**, KNN based **Clustering recommender**, **Item-Item association** based recommender, **Bi-Partite graph** based association recommender and **Neural Embedding** based recommender. • The Neural Embedding based recommender was built for handling sparse input data. The **Bi-Partite graph** based association recommender was used for considering co-occurrences among items and to consider higher order proximities among the items. Item-Item association recommender was built based on **Apriori algorithm**. **Project Website (On Github) :** https://tinyurl.com/t845ysv4
Green path prediction based on Air quality data [AUG 2019- JAN 2020]	Used **Time series analysis** to forecast the air quality data of a particular region for a period of one month. Used a LSTM based forecasting model. Analyzed the variation in concentration of various pollutants during the day for **Chennai** and **Noida** and modeled an algorithm to predict the safest path **(Green path)** between start and destination points in terms of best Air Quality.
Lightweight CNN model for Music Instrument Classification [JAN 2021- MAY 2021]	We build a Lightweight-CNN model to classify musical instruments. We compute the Mel-spectrogram features from input audio data and use it as input. To add robustness, we use a novel data augmentation technique based on the Cut-Mix Algorithm. We optimize the model parameters using Hyperparameter tuning and use pruning to make it lightweight. We also analyze the input by generating the Gradient based Class Activation Maps to identify important DCT coefficients form the input audio **Project Website (On Github) : https://tinyurl.com/u5auamp2**
Other projects	• **Text summarization –** Built both extractive (based on TextRank algorithm) and abstractive text summarization models (based on Encoder-Decoder architecture) • **Snapchat Filters:** Built a **face identification** model. Added Snapchat filters of user's choice on the image frames obtained from the live from the webcam. • **Face Mask Detector:** Trained a **face detection** model to identify **all faces** among the image and classify for each face in the image if the user is wearing a mask or not.

RELEVANT COURSE WORKS			
Fundamentals of Deep learning	Introduction to Machine Learning	Probability & Statistics for Electrical Engineers	Information theory
Fundamentals of Operations research (FOR)	Introduction to Econometrics	Principles of Economics	Linear Algebra for engineers

CERTIFICATIONS

1. Data Science Essential from Microsoft, EDX.
2. Natural Language processing offered by National Research Centre HSE Russia, Coursera.
3. Deep learning Specialization from Deeplearning.ai, Coursera.
4. Introduction to R programming, Coursera.
5. Introduction to Machine learning, from Stanford University, Coursera.
6. The complete Oracle SQL certification Course, Udemy.
7. Finance for Non-Finance Professionals, Coursera

TECHNICAL SKILLS	
Software:	• **Python 3** (Tools: Tensorflow, Keras, PyToch, Pandas, Numpy, Keras-tuner, Scikit-Learn, Imblearn, Matplotlib , Seaborn, ARIMA, statsmodels (TSA), NLTK, Gensim, Spacy, HuggingFace, TextAttack. • **C, C++, SQL, MATLAB, R**

POSITIONS OF RESPONSIBILITY

- **Head of Oratory Club** IIT Madras (April 2020-April 2021)
- Coordinator**, Coding & logic team**, Shaastra 2020 (May'19 – Jan'20)
- Coordinator in Saathi-Mentorship program. Mentored 10 freshmen throughout their first year (Jul'19 – May'20)
- Part of Sponsorship & PR team, Shaastra 2019 (Jul'18- Jan'19)

EXTRACURRICULAR ACTIVITIES

SPORTS	• Represented **Tamil Nadu State** Cricket team in U-14 and U-16 levels • Part **of IITM cricket** team and **Captain** of the hostel cricket team.
QUIZZING	• Part of finals of three national level quizzes. • Finalist in **TIMES NIE Quiz, TIMES SCIENCE Quiz, Bournvita Quiz Contest.**