Debapriya Tula

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Education

Indian Institute of Information Technology, Sri City, Andhra Pradesh *2017 - 2021*
Bachelor of Technology in Computer Science and Engineering GPA: **9.35**/10.0

Work Experience

Google Research, India *Aug 2022 - Present*
Pre-Doctoral Researcher
Advisors: Dr. Gaurav Aggarwal & Dr. Sujoy Paul

- Worked on improving test-time adaptation of OCR models for a writer's handwriting.
  - Adaptation with a **single** handwriting image.
  - Improved character error rate by **7-8 %**.
- Working on improving understanding of images containing text.

Tata Consultancy Services - Innovation Lab, India *Aug 2021 - July 2022*
Machine Learning Engineer

- Develop ML/DL models to & predict user behavior for services related to General Electric's Healthcare segment.
- Build and deploy ML models using AutoML toolkits for big datasets (10-20 GB), with modules for statistical data analysis and output explainability.

LimeChat, India *Jan 2021 - June 2021*
NLP Software Development Intern

- Redesigned the **order tracking** system to make it more seamless and fault-tolerant.
- Redesigned LimeChat's **FAQ management** and **Utterance management** systems and deployed them as core features in **5 weeks**.
- Set up the chatbot for **Nissan**, LimeChat's biggest client undertaking hitherto.

IIT Delhi, India *May 2020 - July 2020*
Computer Vision Research Intern

- Designed an efficient pipeline for the problem of motion segmentation of fish in **underwater scenarios** solved as an **unsupervised** learning task.
- Replicated a few research papers in the course of exploring the transferability of other models to the problem.

Tezpur University, India *May 2019 - June 2019*
Research Intern

- Maximize stacking regions to find the most stable secondary structure(s) of RNA using concepts from graph theory.
- Awarded the **best paper** at **ICCCIoT, 2020**.

Publications

Preprints

- **Is it an i or an l: Test-time Adaptation of Text Line Recognition Models.**
  Debapriya Tula, Sujoy Paul, Gagan Madan, Peter Garst, Reeve Ingle, Gaurav Aggarwal.
  Under review, 2023

- **Target Aware Network Architecture Search and Compression for Efficient Knowledge Transfer.**
  Shabbeer Basha, **Debapriya Tula**, Sravan Kumar Vinakota, Shiv Ram Dubey.
  Under review, 2023.

Published

- **Ensemble of Multilingual Language Models with Pseudo Labeling for offence Detection in Dravidian Languages.**
  Debapriya Tula, Prathyush Potluri, Shreyas Ms, Sumanth Doddapaneni, Pranjal Sahu, Rohan Sukumaran, Parth Patwa.
  *European Association for Computational Linguistics (**EACL**), 2021*
  DravidianLangTech workshop, 2021.

- **Estimating RNA Secondary Structure by Maximizing Stacking Regions.**.
  Piyali Sen, **Debapriya Tula**, S.K. Ray, S.S. Satapathy
  *International Conference on Computer Communication and Internet of Things (**ICCCIoT**), 2021*
  🏆 **Best Paper Award**.

- **Offense Detection in Dravidian Languages using Code-Mixing Index based Focal Loss and Cosine Normalization**.
  Debapriya Tula, Shreyas Ms, Viswanatha Reddy, Pranjal Sahu, Sumanth Doddapaneni, Prathyush Potluri, Rohan Sukumaran and Parth Patwa.
  Springer Nature Computer Science, 2022 (Journal).

- **Incorporation of transition to transversion ratio and nonsense mutations, improves the estimation of the number of synonymous and non-synonymous sites in codons.**
  Suvendra K Ray, Ruksana Aziz, Piyali Sen, Pratyush Kumar Beura, Saurav Das, **Debapriya Tula**, Madhusmita Dash, Nima Dondu Namsa, Ramesh Chandra Deka, Edward J Feil, Siddhartha Sankar Satapathy.
  DNA Research, 2022 (Journal).

Projects

- **Content-Based Image Retrieval** *Oct 2020 - May 2021*
  - Developed a multi-loss model for retrieving relevant images from large datasets.
  - Optimized the model using self-attention and an angular-based loss for a **curriculum-based sampling**.
- **Speech Emotion Recognition** *Sep 2020 - Dec 2021*
  - Applied augmentation to speech signals, extracted MFCC features and trained a Random Forest Classifier for identifying emotion from speech directly.
  - Accuracy obtained on datasets: RAVDESS: **73.5 %** & TESS: **98.6 %**.
- **Solingo** *Feb 2020 - Apr 2020*
  - An app that recognises handwritten math expressions from captured images.
  - Implemented an attention-based model for expression recognition, including LaTeX transformation of the input, using **Pytorch** and **Selenium**.
  - Accuracy on CROHME dataset: **73 %**.
- **Speech Dereverberation** *Sep 2018 - Dec 2018*
  - Led a team of 4 to build a system to remove reverb(echo) from sound signals by predicting the reverb's contribution in the present signal, using NumPy and audioread.
  - Similarity with original signal: **65-75 %**.

Awards and Honors

- **Best Paper Award** at ICCCIoT, 2020.
- **INSPIRE** Award for my science project in 2013.
- **State rank 11** in **NSTSE** exam in 2012.

Talks

- **Deep Learning - Then, Now and Beyond**
  - Central University of Odisha, India *Apr 2023*

Professional Responsibilities

- *AI Student Ambassador* - Intel *Oct 2019 - June 2021*
  - Organize hands-on sessions and paper reading sessions on topics related to AI/ML. Encourage students to work on AI/ML projects and assist them.
  - Designed an interpolation method that reduces the frame rate in videos followed by frame reconstruction for efficient (internet) data usage. Average interpolation error on Visual Tracker Benchmark(VTB) dataset - **12.6 %**.
- *Undergraduate Teaching Assistantship* - Computer Science and Engineering, IIIT Sri City
  - Advanced Data Structures and Algorithms - *Prof. Shiv Ram Dubey* *Fall 2019*
  - Data Structures and Algorithms - *Prof. Prerana Mukherjee* *Spring 2020*

Skills and Tools

Deep Learning, **Computer Vision**, Natural Language Processing, Data Science, **Python**, MATLAB, Javascript, **Git**, SQL, NoSQL, **Bash**, Rasa, **Tensorflow**, **Pytorch**, **Keras**, **JAX**, FastAI, Sklearn, **Numpy**, **Pandas**, Seaborn, LaTeX

Other Details

- **Language Proficiency:** English, Hindi, Odia, Assamese.
- **Hobbies:** Reading books, playing the guitar, singing, playing table tennis and badminton.