

Debapriya Tula

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EDUCATION

Indian Institute of Information Technology, Sri City
Bachelor of Technology in Computer Science and Engineering

2017 - 2021
GPA: **9.35**/10.0

RESEARCH EXPERIENCE

Google Research, India

Aug 2022 - Present

Pre-Doctoral Researcher

Advisors: Dr. Gaurav Aggarwal [✉](#) & Dr. Sujoy Paul [✉](#)

Test-time adaptation of OCR models.

Under review

- Formulated the novel problem of test-time adaptation of OCR models to a **single** image of a writer's handwriting.
- Designed a confidence and consistency based self-training method to improve predictions over the single image iteratively.
- Improved character error rate (CER) over benchmark datasets by **7-8 %**.

Efficient encoding of images containing text for building efficient vision-language models.

In progress

- Developed a method to embed textual content of an image within the image, for direct processing by vision encoders.
- Experimenting with a variety of vision-language tasks to check the efficacy and adaptability of the proposed method.

IIT Delhi, India

May 2020 - July 2020

Computer Vision Research Intern

Advisor: Dr. Brejesh Lall [✉](#)

- Designed an efficient pipeline for the problem of motion segmentation of fish in **underwater scenarios** solved as an **unsupervised** learning task.
- Modelled underwater disturbances and designed a self-training pipeline for the problem.
- Implemented a few **video object segmentation** papers to assess their transferability to this challenging setting.

Tezpur University, India

May 2019 - June 2019

Research Intern

- Developed an algorithm to maximize stacking regions for estimating the most stable secondary structures for given RNA sequences.
- Designed a dynamic programming based solution and used graph concepts like maximum independent sets and circle graphs to simplify the problem.
- Awarded the **best paper** at **ICCCIoT, 2020**.

PUBLICATIONS

Preprints

- **Is it an i or an l: Test-time Adaptation of Text Line Recognition Models.** [✉](#)
D Tula, S Paul, G Madan, P Garst, R Ingle, G Aggarwal.
Under review, 2023
- **Target Aware Network Architecture Search and Compression for Efficient Knowledge Transfer.** [✉](#)
S Basha, D Tula, S Vinakota, S R Dubey.
Under review, 2023.

Published

- **Offense Detection in Dravidian Languages using Code-Mixing Index based Focal Loss and Cosine Normalization** [✉](#)
D Tula, Shreyas Ms, V Reddy, P Sahu, S Doddapaneni, P Potluri, R Sukumaran, P Patwa.
Springer Nature Computer Science, 2022 (Journal).
- **Ensemble of Multilingual Language Models with Pseudo Labeling for Offense Detection in Dravidian Languages.** [✉](#)
D Tula, P Potluri, Shreyas Ms, S Doddapaneni, P Sahu, R Sukumaran, P Patwa.
European Association for Computational Linguistics (EACL), 2021
DravidianLangTech workshop, 2021.
- **Estimating RNA Secondary Structure by Maximizing Stacking Regions.** [✉](#)
P Sen, D Tula, S K Ray, S S Satapathy
International Conference on Computer Communication and Internet of Things (ICCCIoT), 2021
🏆 **Best Paper Award.**

ENGINEERING EXPERIENCE

Tata Consultancy Services - Innovation Lab, India [↗](#)

Aug 2021 - July 2022

Machine Learning Engineer

- Built ML models for forecasting user health policy renewal on data (~ **20 GB**) provided by General Electric HealthCare.
- Developed a framework to process diverse tabular data using AutoML toolkits and deployed it.
- Developed modules for statistical data analysis of the results for user interpretability using Plotly.

LimeChat, India [↗](#)

Jan 2021 - June 2021

NLP Software Development Intern

- Redesigned the **order tracking** system to make it more seamless and fault-tolerant (**30%** reduction in user dropoffs).
- Redesigned LimeChat's **FAQ** and **Utterance management** systems and deployed them as core features in **5 weeks**.
- Designed an end-to-end chatbot for **Nissan**, LimeChat's biggest client undertaking hitherto.

SELECT PROJECTS

• Content-Based Image Retrieval

Oct 2020 - May 2021

- Developed a curriculum learning method for retrieving images from large datasets.
- Added a global attention module and an angular-based loss based soft to hard example sampler to help the model learn both simple and complex features.

• 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 %**.

• Speech Dereverberation [↗](#)

Sep 2018 - Dec 2018

- Implemented a weighted prediction error method to estimate reverb in a speech signal.
- 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

ACADEMIC SERVICE AND VOLUNTEERING

• AI Student Ambassador - Intel

Oct 2019 - June 2021

- Organized 1 hr long hands-on sessions and paper reading sessions on topics related to AI/ML. Encouraged students to work on AI/ML projects and assisted them.
- Implemented a video frame interpolation method using adaptive separable convolutions 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

RELEVANT COURSEWORK

Discrete Mathematics, **Linear Algebra**, Probability Theory and Complex Analysis, Statistical Data Analysis, Advanced Statistical Methods, Theory of Computation, **Artificial Intelligence**, Digital Image Processing, Computer Graphics and Multimedia, **Deep Learning**, **Computer Vision**, Natural Language Processing

LANGUAGES AND TOOLS

Python, MATLAB, Javascript, **Git**, SQL, NoSQL, **Bash**, Rasa, **Tensorflow**, **Pytorch**, **Keras**, **JAX**, FastAI, Sklearn, Numpy, Pandas, Seaborn, LaTeX