Tejas Vaidhya

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Education

Indian Institute of Technology, Kharagpur — *CGPA:* 8.01/10
Major in Bachelor of Architecture — *Jul' 17 – Present*
Minor in Mathematics and Computing

Macro Vision Academy, Burhanpur — *Aggregate:* 86%
High Secondary Examination — *Apr' 15 – May'17*

Ram Shanti Vidya Mandir, Pandhurna — *CGPA: 10/10*
Secondary Examination — *Apr'14 – Mar' 15*

Research Interests

Machine Learning • Computer Vision • Natural Language Processing • Deep Learning

Research Experience

Google Summer of Code @Julialang, Work from home — *May'20 – Present*
Advisor: Dr. Avik Sengupta and Mr. Ayush Kaushal [link]

Topic: **Developed framework for Statistical and Deep-Learning based Language model**

- Developed a **framework for traditional Language model** and implemented MLE, Lidstone, Laplace, Witten Bell interpolation and other algorithms APIs for users
- Re-implemented **SentencePiece** unigram encoder in complete Julia and also developed Sentencepiece wrapper for Julia-users
- Contributed **framework for ALBERT from scratch** (A Lite Bidirectional Encoder Representation from Transformers) in TextAnalysis (Natural language Processing Library in Julia ecosystem) and also added documentation, test and training-tutorials.

Research Areas: Natural Language Processing, Machine Learning, Software Development

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ATLAS experiment at CERN, CUHK — *March'20 – Present*
Advisor: Dr. Tom Cheng

Topic: **Identification of Tau-leptons from Boson decay**

- Set up the CERN virtual machine filesystem over a GPU cluster for experimening with the calorimeter and track measures of decays particles.
- Reimplemented the previously used techniques like Boosted Decision Trees and Recurrent neural networks to efficiently reject false signals.
- Currently working on a larger parameter model based on transformers to improve the identification of Tau-Leptons and reduce the false negatives.

Research Areas: Deep Learning in particle physics, Machine Learning

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Centre for Artificial Intelligence, IIT Kharagpur — *Aug'19 – Jan'19*
Advisor: Prof. Sudeshna Sarkar

Topic: **Context based question answering NLP model**

- Developed a **bidirectional auto encoder-based model** which uses the information extracted from context with out of reference knowledge to get the softmax probabilities over all the possible answers to a question
- Extracted the edges based relations from commonsense corporas like ConceptNet and NELL
- Worked on making commonsense inclusive word vectors using the relations extracted like ConceptNet Numberbatch

Research Areas: Natural Language Processing, Machine Learning

Open Source Contributions

Julia Ecosystem *Dec'19 –Present*

Package Development and Bugfixes [Github]

- Released checkpoints for pretrained weights in BSON format as desired by Julia and provide APIs for conversion
- Contributed to Paragram embedding APIs and improved code base in Embedding.jl and reduced code coverage by 60%
- Arthor of GoogleDrive.jl, Julia's official package to automate Google-Drive download

Projects

Kinship Relationship Prediction *May'19 – Jul'19*

Kaggle Challenge [Github]

Topic: **Predicting if two persons share kinship relationship based solely on the images of their faces**

- Developed a **Siamese convolutional neural network**-based model for feature extraction and a dense layer on top of it for binary classification
- Tuned the hyperparameters to achieve more than 85% accuracy on the Face in the Wild dataset

Frameworks/Libraries Used: TensorFlow, Keras, Pandas

Energy Efficient Design *Feb'19 – Apr'19*

Term Project

Advisor: Prof. Shankha Pratim Bhattacharya [Github]

Topic: **Task Manager: Term project for the course**

- Developed a 3D model of **Residential Complex for Visiting Researchers** within REVIT and Lumion is used for rendering
- Performed Energy Analysis and Wind Analysis on the building design through all stages, from the earliest conceptual phase through detailed design, to ensure constant working towards the most energy-efficient building possible.

Skills

Languages	Python • C/C++ • Java • JavaScript • julia
Libraries/Frameworks	TensorFlow • PyTorch • OpenCV • Keras • Flux
Web/Development	HTML • CSS • Django • Android
Tools	Git • Shell • Unix • Markdown • Microsoft office • Photoshop • Revit

Relevant Courses

CS231n(Stanford)	NLP (Coursera)	Deep Learning	Machine Learning(Coursera)
Probability and Statistics	Discrete Mathematics	Operating Systems(L)	Programming and Data Structure (L)
Economics	Linear Algebra	Energy Efficient Design	Design and Analysis of Algorithms(L)

*(*marked courses are still ongoing, 'L' marked course have a laboratory component with them)*

Awards and Achievements

Joint Entrance Examination (JEE) – Advanced 2017

Among top **0.12**% of the **0.2 million** candidates

Joint Entrance Examination (JEE) – Mains 2017

Among top **0.07**% of the **1.2 million** candidates

Positions of Responsibility

- **Department Representative, CDC IIT Kharagpur,** Part of a team of 30 responsible professors for planning and Execution of the placement of 3000+ student and Acted as a linkage between the administration, students and company ensuring better career possibilities and recruitment process**.**
- **Senior member of ShARE, IIT Kharagpur** of a Global Student Think Tank with 620+ members from over 30 universities across 12 countries.
- **Vice Caption** of Ad Design team of Azad Hall of Residence, secured browns medal Browns medal in Intra-college championship