Saiteja Talluri

4th Year Undergraduate · Computer Science & Engineering

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Education

Bachelor of Technology, IIT Bombay   *Mumbai, India*

Computer Science & Engineering   *July. 2016 - Present*

- GPA: 8.52/10.00 (after seven semesters)
- Pursuing Honors in Computer Science and Engineering
- Pursuing Minor in Electrical Engineering

Sri Chaitanya Narayana Junior College   *Hyderabad, India*

Intermediate/+2   *May. 2016*

- Percentage: 98.60 %

Sri Chaitanya Techno School   *Hyderabad, India*

Matriculation   *May. 2014*

- GPA: 9.80/10.00

Publication

Question Generation from Paragraphs: A Tale of Two Hierarchical Models   *Mumbai, India*

V.Kumar, Raktim, Sai Teja Talluri, Ganesh Ramakrishnan, Yuan-Fang Li, Reza Haffari (Submitted to ACL 2020)   *Dec. 2019*

- Automatic question generation from paragraphs is an important and challenging problem, particularly due to the long context from paragraphs.
- In this paper, we proposed and studied two hierarchical models for the task of question generation from paragraphs.
- We proposed (a) a novel hierarchical BiLSTM model with selective attention and (b) a novel hierarchical Transformer architecture, both of which learn hierarchical representations of paragraphs.
- While the introduction of the attention mechanism benefits the hierarchical BiLSTM model, the hierarchical Transformer, with its inherent attention and positional encoding mechanisms also performs better than flat transformer model.
- We conducted empirical evaluation on the widely used SQuAD and MS MARCO datasets using standard metrics. The results demonstrate the overall effectiveness of the hierarchical models over their flat counterparts.

Industry Experience

Open Source Development   *Worked Remotely*

OpenCV (Google Summer of Code)   *May. 2019 - Aug. 2019*

- Implemented the python bindings for the facial landmark API in OpenCV comprising of models based on Active Appearance Model (AAM), Local Binary Features (LBF) and Ensemble of Regression Trees implemented in C++.
- Explored the possibility of adding a 3D facial alignment model based on a research paper by Adrian Bulat to OpenCV Model Zoo.
- Worked on making a smaller facial landmark detection model with 5 points instead of the standard 68 and added face stabilization.

End to End pipeline for Digital Signage Analytics   *Bangalore, India*

Panasonic India Innovation Centre   *May. 2019 - July. 2019*

- Analysed the digital signage video to give insights regarding the gender, age and emotion of the audience.
- Integrated facial recognition (based on the Facenet paper) to identify face id and performed facial clustering using DBScan to add new face ids to the database and used this information to estimate the reach of the advertisements.
- Implemented gaze tracking (based on CVPR 2018 paper) to estimate the average attention time of audience on the digital signage board.

Game Play Programming   *Pune, India*

Ubisoft Entertainment Ltd.   *May. 2018 - July. 2018*

- Developed a messenger racing game in Typescript using Pixi JS engine and Phaser framework.
- Implemented localization in the game and generated the track from a random seed using Perlin Noise Algorithm.
- Created a messenger bot for the game using webhooks and Graph API and deployed it on Heroku server.
- Implemented trackers in game for data analysis and created UI, triggers and score manager for the leaderboard.

Image segmentation of gold jewels   *Bangalore, India*

Rupeek Fintech Pvt. Ltd   *Nov. 2017 - Dec. 2017*

- Developed a prototype to calculate stone deduction of jewels using computer vision and image processing.
- Used background subtraction algorithms like the Rolling Ball Algorithm for efficient detection of background, employed clustering algorithms like K-mean and DBScan for noise removal in the result.
- Implemented a testing framework and improved the overall build and infrastructure of the prototype, achieving an accuracy up to 80%
- Used AWS S3 for raw image storage and deployed it as web API using Node.JS framework on an AWS EC2 instance.

Academic Projects

Extraction of Facial Features from Speech (in Tensorflow)
Automatic Speech Recognition

Guide : Prof Preeti Jyoti
Autumn '19

- Implemented a neural network model (based on Speech2Face MIT paper) that takes the complex spectrogram of a short speech segment as input and predicts a 4096 dimensional feature vector representing the face.
- We trained our model on 5000 videos from AVSpeech dataset and achieved a face retrieval performance (within the top 25 results) of 70% .

Context-aware Captions from Context-agnostic Supervision (in Pytorch)
Computer Vision

Guide : Prof Arjun Jain
Spring '19

- Scaling of context-sensitive behavior to real-world vision tasks like justification (context is another class) and discriminative (context is a semantically similar image) image captioning requiring pragmatic reasoning.
- Modified the LSTM recurrence and added the class information to the output layer of the "Show, Attend and Tell" architecture.
- Implemented Emitter-Suppressor (ES) beam search for inference on the modified model with soft attention.

Compiler for C-like language (using Lex, Yacc, C)
Compilers

Guide : Prof Uday Khedker
Spring '19

- Developed a compiler and evaluator for subset of C supporting functions, scope levels and control sequences.
- Used Lex for tokenizing, Yacc for parsing and constructed AST (abstract syntax tree) to generate MIPS assembly code.

Fake News Detection by Crowdsourcing (using SQL, Java, JS, Ajax)
Database Lab

Guide : Prof Sudarshanan
Autumn '18

- Developed a Web and Android App for crowdsourcing the verification of spurious news articles.
- Designed database and interfaces for volunteers and admins providing tools to review, appoint and approve.
- Implemented task routing algorithms to distribute tasks among volunteers with domain specific knowledge.

Vector-Valued Image Regularization with PDEs (in MATLAB)
Digital Image Processing

Guide : Prof Ajit Rajwade
Autumn '18

- Built an image regularization tool using techniques based on solutions to Oriented Laplacian PDEs.
- Used a generic anisotropic diffusion equation based on regularization in terms of local filtering with spatially adaptive Gaussian kernels and applied the solution for image smoothing, inpainting and flow visualization.

Microarchitectural attacks (in C)
Computer Architecture

Guide : Prof Bernard Menezes
Autumn '18

- Implemented FLUSH+RELOAD Attack to extract the private key from the GnuPG implementation of RSA.
- Implemented Cache Template attack to profile and exploit cache-based information leakage of programs.
- Proposed an automated DRAMA Template attack by reverse engineering DRAM addressing and template attack.

3D Modelling and Animation (in OpenGL)
Computer Graphics

Guide : Prof Parag Chaudhari
Autumn '18

- Designed 3D graphical models through hierarchical modelling in OpenGL with textures, shading and lighting.
- Implemented framework to create dynamic Bezier curves through clicked control points for camera motion in the animation.

Image Stitching and Video Stabilization (using Python)
Computer Vision

Guide : Prof Arjun Jain
Spring '19

- Stitched images by computing homograpy matrix after applying RANSAC on key points extracted using SIFT algorithm.
- Implemented KLT Feature tracker using motion models and Video Stabilization by smoothing parameters of motion.

TeleCommunication System Design (in C++)
Computer Networks

Guide : Prof Bhaskar Raman
Spring '18

- Designed a prototype of communication system implementing a set of basic functionalities of the physical layer and link layer of internet protocol stack, from scratch using Arduinos.

Railway Signal Controller (in VHDL and C)
Digital Logic Design

Guide : Prof Supratik Chakraborty
Spring '18

- Developed a PC (backend) in C to synchronize between multiple FPGAs (Railway Signal Controllers) via. UART securely using encryption and programmed the FPGA in VHDL to show signals accordingly.

The Book Store (using Django)
Software Systems Lab

Guide : Prof Kavi Arya
Autumn '17

- Developed a Django based web application which serves as a bookstore for reading and lending books.
- Implemented features like Social Authentication, Elastic Search and Uploading using Django libraries.
- Created a simple chat box using Django channels with the help of websockets.

Tower of Hanoi Solver (using Racket)
Abstractions in Programming

Guide : Prof Amitabha Sanyal
Spring '17

- Implemented a hint option to find the best move from a given state of a Tower of Hanoi by converting its state diagram into a graph using Graph library and applying Breadth First Search Algorithm on it.

Academic Achievements

Scholastic

2016	**All India Rank 5**, in IIT JEE Advanced amongst 150,000 candidates
2016	**All India Rank 6**, in IIT JEE Mains out of 1.2 million candidates
2016	**State Rank 1**, in TS-EAMCET conducted by Ministry of HRD, Govt of Telangana
2016	**State Rank 7**, in AP-EAMCET conducted by Ministry of HRD, Govt of Andhra Pradesh
2014	**All India Rank 43**, Recipient of Kishore Vaigyanik Protsahan Yojana (KVPY) Scholarship
2012	**National Top 25**, Recipient of NTSE Scholarship awarded by NCERT under Ministry of HRD

Olympiads

2016	**Gold Medalist**, for being amongst the Top 35 students in Indian National Physics Olympiad Camp
2014	**Gold Medalist**, 11th International Olympiad in Junior Science held in Mendoza, Argentina
2014	**Infosys Award**, for exceptional performance in International Olympiads
2013	**State Rank 1**, 26th Science Talent Exam conducted by Dr. AS Rao Awards Council
2012	**All India Rank 6**, in National Mathematics Olympiad conducted by AMTI

Technical Skills

Programming Languages	Proficient in C++, C, Python, Java, Racket(Scheme), SWI-Prolog, Bash, MATLAB, VHDL
Web Development	Proficient in Django, HTML, CSS, Familiar with Javascript, JQuery
Softwares	Git, OpenGL, Makefiles, CMake, OpenCV, Android Studio
Deep Learning	PyTorch, Tensorflow, Keras

Relevant Courses

Computer Science	Data Structures and Algorithms, Design and Analysis of Algorithms, Networks, Architecture, Databases, Compilers
AI & ML	Advanced Machine Learning, Computer Vision, Image Processing, Reinforcement Learning, Speech Recognition
Miscellaneous	Web Mining and Information Retrieval, Cryptocurrency and Blockchain, Computer Graphics, Cloud Computing

Positions Of Responsibilities

Department Academic Coordinator — *IIT Bombay*

CSE Department — *March. 2019 - Present*

- Leading a team of 24 mentors to help them guide CSE students under the DAMP program and maintain regular interaction between the faculty and the mentors to smooth the mentoring process.

Teaching Assistant — *IIT Bombay*

CSE Department — *July. 2017 - Present*

- Responsible for clarifying queries of students in discussion forums and labs, helping with creation of course material and grading assignments.
- Courses Taught — Quantum Physics (Fall 2017), Software Systems Lab (Fall 2018, Fall 2019), Database Management (Spring 2020)
- Awards — Teaching Assistant of the Semester for Software Systems Lab for two consecutive years.

Department Academic Mentor — *IIT Bombay*

CSE Department — *March. 2018 - March. 2019*

- Among the 22 mentors, each responsible to guide a group of 6 students of second year in academics and help them cope with their curriculum.

Batch Representative — *IIT Bombay*

CSE Department — *July. 2017 - Present*

- Represented the CSE Class 0f 2020 for three consecutive years in the Department UG Council and other department events.

Institute Data Analytics Team Member — *IIT Bombay*

Analytics Club — *July. 2018 - May. 2019*

- Member of the official Analytics team of IIT Bombay and involved in the analysis of real life data regarding the Institute.

Extracurricular Activity

Summer of Science Mentor of Machine Learning and Computer Vision under MnP club, IIT Bombay	2019
Exhibitions Coordinator at 21st Edition of TechFest, Asia's largest Technological festival.	2017
Volunteered with National Service Scheme, IIT Bombay under Vikas program.	2016-17
Attended Vijyoshi Science Camp organized by Indian Institute of Science (IISc), Bengaluru, India.	2015