AILNENI RAKSHITHA | Curriculum Vitae

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RESEARCH INTEREST

I'm mainly interested in the fields of Natural Language Processing and Deep Learning. To be specific, my areas of interest are information extraction, commonsense reasoning and AI for social good.

EDUCATION

2019 - 2021: **M. Tech in Electrical and Electronics Engineering (CGPA: 9/10)**, Indian Institute of Technology (IIT), Gandhinagar, India.

2015 - 2019: **B. Tech in Electrical and Electronics Engineering (CGPA: 7.79/10)**, Visvesvaraya National Institute of Technology, Nagpur, India.

2014 - 2015: **Class 12th (Percentage: 98.3%)**, Sri Chaitanya Junior College, India.

2012 - 2013: **Class 10th (CGPA: 9.8/10)**, Alphores High School, India.

WORK EXPERIENCE

August, 2021 - Present: **Data scientist**, Halliburton R & D, Bengaluru, India.

1. **Building Improved Search Engine for DecisionSpace365:** Integrating a Learning to Rank model with Apache Solr page indexing to rank search results effectively. The Learning to Rank model has NLP-based features such as cosine similarity between a query and document weighted TF-IDF vectors and document views.
2. **ESP Failure Prediction**: For early detection, auto-regression (with LSTM) was used with inputs such as intake temperature, discharge pressure, motor temperature, and current values at previous timesteps to predict the value of current in the future. In the case of imminent failure detection, unsupervised learning approach (Isolation Forest) was leveraged to detect anomaly points in a day.

May - July, 2018: **Intern at** Reliance Industries

Objective was to explore and recommend IOT technique in Electrical Engineering. I analyzed the plant structure and designed an outline for condition monitoring and preventive maintenance of transformer using RFID/NFC detection. I worked on predictive maintenance of motor using dynamic time warping. I Proposed several ideas like smart dust sensors to increase the productivity and safety of the plant.

RESEARCH PROJECTS

May – Jun 2020: **Generative Adversarial Networks for Augmenting Training data** under the supervision of Dr. Ravi Hegde – ***Master's Thesis***

1. Implemented baseline image translation model (Pix2pix) for the generation of label-specific microscopic images from binary masks.
2. Generated 3D images from the corresponding z-slices using 2D networks. The resulting images are evaluated using Haralick textural features.
3. Proposed 'modified StarGAN' framework to improve the textural range of the generated images.

Aug – Dec 2020: **NLP Contribution Graph** under the supervision of Dr. Mayank Singh

1. Built a knowledge graph with the contributions from NLP research papers. It was integrable within other knowledge graph infrastructures such as ORKG.
2. Classified sentences in a research paper into contribution and non-contribution categories by using an LSTM model in the first part. Then, scientific entities and relational cue phrases were extracted from contribution sentences.
3. Triples in the form of subject-predicate-object were formed from contribution sentences and subsequently classified into different information units' such as model, baseline, dataset etc.

May – Jul 2020: **Frequency-tuned Salient Region Detection** under the supervision of Dr. Shanmuganathan Raman

Formation of saliency map of the image from the L2 norm between mean value pixel in LAB format and Gaussian filtered image. Comparison of fixed and adaptive threshold applied on the mean shift segmented image.

Oct – Dec 2019: **DRDO SASE's UAV Fleet Challenge**

Detection of a green colored box on 40 x 30 field with the help of swarm of drones in minimum time. Assembling and integration of drones with Pixhawk flight controller, camera, raspberry pi, GPS etc. and the drone was automated using QGround Control software. For object detection we trained and deployed Yolo V3 model and established connection between the three drones.

Jan – Apr 2019: **To build a prototype of self-driving car using convolutional neural networks (CNN) and Image processing techniques** – ***Undergrad Thesis***

Output of Image processing and Learning based approaches was converted into steering angle which is given to a RC car to follow a lane in real-time.

PUBLICATIONS

Ailneni Rakshitha Rao. 2022. ASRtrans at SemEval-2022 Task 4: Ensemble of Tuned Transformer-based Models for PCL Detection. In *Proceedings of the 16th International Workshop on Semantic Evaluation (SemEval-2022)*, pages 344–351, Seattle, United States. Association for Computational Linguistics**.**

Ailneni Rakshitha Rao and Arjun Rao. 2022. ASRtrans at SemEval-2022 Task 5: Transformer-based Models for Meme Classification. In *Proceedings of the 16th International Workshop on Semantic Evaluation (SemEval-2022)*, pages 597–604, Seattle, United States. Association for Computational Linguistics.

TEACHING

- TA for Advanced Numerical Methods in Engineering (MA 602), IIT Gandhinagar.
- TA for Intro to Data Science (CS 328), IIT Gandhinagar.
- RA for Electrical and Electronics lab (ES 105), IIT Gandhinagar.

SERVICE

- Reviewer for SemEval 2022.
- Volunteering at Climate Mind as a NLP Researcher.

SKILLS

- **Tools and programming:** Python, Pytorch, Tensorflow, Git, LaTeX, HTML/CSS, C, Shell Scripting, JavaScript, MATLAB.
- **Communication:** Telugu (Native), English (Proficient), Hindi (Proficient), French (Beginner).

ACADEMIC ACHIEVEMENTS

- 2010: **Centre first** in 11th State level MATHS Talent test conducted by 'Association For Improvement of Maths Education' (A.I.M.Ed).
- 2010: Secured 22nd rank in 4th International Mathematics Olympiad.
- 2009, 2011: Secured **Distinction** in Australian Chemistry.
- 2011: Secured 98th rank in national level science talent search examination conducted by UNIFIED COUNCIL.

EXTRA CURRICULAR ACTIVITIES

- District level Table tennis player.
- 2016: Organizer of 'Freak O Matrix' at technical fest AXIS'16 of Visvesvaraya National Institute of Technology (VNIT).
- 2020: Member of 'Mean Mechanics' club, IIT Gandhinagar.
- 2017: Participated in Girls Cricket in Institute Gathering (IG), VNIT.
- 2015-2016: Member of Class Committee for 1st and 2nd semesters during undergraduate studies at VNIT.