# SAIROOP BODEPUDI

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## EDUCATION

**Indian Institute of Technology (IIT) Palakkad, India** *July 2018 - Present*
Bachelor of Technology in Computer Science and Engineering CGPA: **9.32/10**
Expected graduation: June 2022

**Sri Chaitanya Jr Kalasala**, India *2016 - 2018*
Higher Secondary Education Overall score: **97.3/100**

## FIELDS OF INTEREST

Deep Learning, Natural Language Processing, Computer Vision, Medical Imaging and Diagnostics, Knowledge Graphs, Case Based Reasoning.

## RESEARCH EXPERIENCE

**An improved case based reasoning system for knowledge graphs** *April 2021 - Present*
**ETH Zürich, Switzerland**
Advisor : Prof. Mrinmaya Sachan

- Modified case based reasoning system for knowledge base completion creating an efficient (reduced inference time and memory footprint) model via the reduction of search paths.
- Used graph neural networks and attention based models for ranking candidate solutions.
- Improved model performance by nearly **10 times** on path based methods by integrating selective prediction and related algorithms including temperature scaling.

**Beamforming in ultrasound imaging using graph neural networks** *August 2021 - Present*
**IIT Palakkad, India and University of Alberta, Canada**
Advisors : Prof. Mahesh R Panicker & Dr. Abhilash H

- Modelling the complex relationships between the sensor data in a structured manner using graphs.
- Working on removing redundant transducers with the help of graph neural networks which will directly help in reducing the computational cost associated with beamforming.

**Patch based neural network transformation for ultrasound imaging** *January 2021 - May 2021*
**IIT Palakkad, India**
Advisor : Prof. Mahesh R Panicker

- Most deep learning based beamforming methods do not employ the power of parallel computing (i.e GPUs) and thereby are bottlenecked by the high dimension matrix operations.
- Constructed a novel deep learning based algorithm which performs patchwise approximation of the best image construction pipeline (MVDR i.e Minimum Variance Distortionless Response) through DAS i.e Delay and Sum (which is the most efficient) intermediate and can be parallelized on a GPU.

## INDUSTRIAL INTERNSHIPS

**International Institute Of Information Technology (IIIT) Hyderabad** Hyderabad, India
*Product Labs* *May 2020 - July 2020*

- Built an end-to-end application to perform face mask detection for COVID-19 risk analysis on edge using deep learning models specifically the YOLOv3.

- Reduced inference time by **3 times** and memory requirements by **5 times** without any decrease in performance through iterative model pruning.
- Extended OpenPose to classify traffic and pedestrian video stream into zones and evaluate the compliance of social distancing norms in the COVID-19 pandemic.

**Cykul Pvt Ltd** Hyderabad, India
*Mobile application development team* *June 2019 - July 2019*

- Modified the original mobile application to include cadence measurement along with better visualization and lower latency through efficient algorithms.
- Headed the Power Prediction module which involved applying artificial neural networks to predict power from other athlete factors.
- Proposed deep learning methods which provided an economical and effective solution for power measurement saving more than $2000 on expensive equipment.

## PROJECTS

**MaPP : Market price predictor using deep learning**

- Built a market price predictor using deep learning algortihms i.e the LSTM with variations and the attention mechanisms to reinforce the output while predicting the future stock trends in the market.
- Addition of priors using textual information such as the newspaper articles obtained from crawling the internet were given to increase robustness and performance of the model. [Github]

## TECHNICAL SKILLS

**Natural language processing:** Transformer-based architectures, language translation models along with knowledge representation and reasoning methods.
**Medical imaging:** Deep learning methods in medical imaging and diagnostics, beamforming employed in ultrasound imaging.
**Computer vision:** Object detection, pose estimation applications in localization, and model optimizations like pruning.
**Competitive programming:** Deep understanding of algorithms and data structures as well as a 3-star coder on CodeChef.
**Programming languages:** C, C++, Python, SML.

## SELECTED COURSEWORK

Artificial Intelligence, Convolutional Neural Networks for Visual Recognition (Stanford CS231N), Natural Language Processing with Deep Learning (Stanford CS224N), Reinforcement Learning, Foundations of Data Science and Machine Learning, Deep Unsupervised Learning (UC Berkeley CS294-158-SP20), Digital Image Processing, Design and Analysis of Algorithms.

## EXTRA-CURRICULAR ACTIVITIES

**Club Mentor:** Mentor in the Data Analytics Club at IIT Palakkad.
**Class representative:** Worked as the class representative for the Computer Science and Engineering batch of 2018 at IIT Palakkad.
**Social Service:** Volunteered for cleanling villages and towns as part of the National Service Scheme.