GONUGUNTA VENKATA SAI MOTHISH

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Education

2022 - present	**Indian Institute Of Science,Bengaluru**	
	M.Tech Robotics and Autonomous systems	(GPA: 8.6/10.0)
2018 - 2022	**Presidency University, Bengaluru**	
	B.Tech in Mechanical Engineering **(Gold Medalist)**	(GPA: 9.17/10.0)
2016 - 2018	**Narayana Junior College, Nellore**	
	Class 12th Board of Intermediate Education, Andhra Pradesh	(Percentage: 95.8 %)
2016	**Don Bosco English Medium High School, Nellore**	
	Class 10th Board of Secondary Education, Andhra Pradesh	(GPA: 9.7/10.0)

Areas of Interests

- Deep Learning
- Computer Vision
- Optimization
- Reinforcement Learning
- Data Science
- Representation Learning

Relevant Coursework @ IISC

- Reinforcement Learning
- Data Science for Smart City Applications
- Theory and Applications of Bayesian Learning
- Robotic Perception
- Stochastic Models and Applications
- Human-Computer Interaction

Skills

Frameworks	Pytorch, Tensorflow, Scikit-learn, Pandas, OpenCV, Keras
Technologies	Intel oneAPI, OpenAI gym, Nvidia Issac gym
Languages	Python, C, Matlab

Projects

Predicting Missing Edges in Social Networks Using Machine Learning | ***Sklearn, Pytorch*** **Oct 2023**

- Objective: Predict missing edges in social networks via machine learning on **Twitter data**.
- Approach: Utilized **NetworkX** for data prep, explored various feature sets, and employed logistic regression and **Adaboost** models. Experimented with sampling strategies and additional features.
- Outcomes: Logistic regression achieved 0.89 AUC, improved to 0.92 with Adaboost. TorchBigGraph yielded 0.9086 AUC on Kaggle, showcasing efforts to enhance accuracy.
- Conclusion: Successfully tackled link prediction challenges, emphasizing iterative feature exploration and model refinement for accurate results.

Bayesian Imputation for Missing Sensor Data in IoT Devices | ***Keras, Pytorch, LSTM*** **Mar 2023**

- Aim: Predict missing values in **IoT sensor** data **(temperature and humidity)** using Bayesian methods.
- Phases: Data analysis, pre-processing, and transitioning from Frequentist to Bayesian approaches.
- Bayesian Models: **Bayesian Ridge Regression**, **Gaussian Process Regression**, and PyMC3 used for accurate imputation.

Automated Driver Assistance System | ***Pytorch, TensorFlow, CNN*** **Jun 2023**

- **Object detection** (**Yolo**) and **Lane Detection** (UltraFast Lane detector) module was developed using pytorch framework. While the **Depth Estimation** (**MiDaS**) was developed using TensorFlow framework.
- The inference time of the model was optimized using the **Intel oneAPI Deep Neural Network Library** on the intel's developer's cloud.
- A performance speedup of approximately 4.5x was achieved using the oneAPI libraries.

Estimation of Vehicle Speed using Computer Vision | ***Pytorch, OpenCV, CNN*** **Apr 2023**

- This was developed as a part of coursework for Robotic Perception course.
- **PWC-NET** a **CNN**-based approach was used to estimate the **Optical flow** from the successive video frames.
- Yolo V5 was used for **object detection** in the given frame.
- Calculated the relative movement of predicted object's movement with optical flow vectors

Adaptive Locomotion of Walking Robots by Learning based methods **2022 - 2024**

- Technologies : **Reinforcement Learning, Deep Learning**
- This my master's project at Stochastic Robotics lab
- STAGE 1: Design and Implement a learning-based controller on a Bipedal walking robot.
- STAGE 2 : Achieving the stable walking through **proprioception** using **Reinforcement learning** blended with physics-based techniques.

Obesity Insights:Using Clustering, Classification and Regression.| ***Sklearn, PyMc3, Pandas*** **Apr 2023**

- Utilizing linear regression, the project predicts BMI based solely on health habits and physical activity parameters.
- Employing **clustering** techniques to identify patterns and behaviors related to obesity, such as meal frequency and family history.
- Implementing a **Gaussian Process Classifier** to predict obesity levels using physical activity and health habits as features, aiding in targeted interventions and public health strategies.

Research Publications

Stoch BiRo: Design and Control of a low cost bipedal robot.

Submitted to ICCAR 2024 (under review)

Inverse Reinforcement Learning based Multimodal Target Prediction for Rapid HRI.

Submitted to IUI 2024 (under review)

Awards and acheivements

AI and Robotics Technology Park Fellowship 2023 **Oct 2023**

Top up fellowship for the Masters project awarded by **ARTPARK** .

2nd place in Intel OneAPI Hackathon **Jun 2023**

- Worked with **Intel AI Analytics Toolkits** and Intel optimized frameworks such as TensorFlow, PyTorch,
- **Real time object detection**, **lane detection** and **Depth estimation** for autonomous vehicles.

University Gold Medal in bachelor's degree — Nov 2022

Winner of university Gold Medal for the Outstanding academic performance in B.Tech Mechanical Engineering 2018-2022.

Finalist in FALLING WALLS LAB INDIA — Mar 2019

Organized By **German Centre for Research (DWIH) and Innovation and DAAD**

- Theme : BREAKING THE WALL OF **IRRIGATION CHALLENGES WITH ML AND IoT**
- Automated Plant Watering System developed using Machine Learning (chili crop) under the guidance of Prof.Raghavendra M Deshpande and Prof.Shashidhar.V