GONUGUNTA VENKATA SAI MOTHISH

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Education

2024 - present	**Indian Institute Of Science, Bengaluru**	
	PhD Computational Data Sciences	(GPA: 9.6/10.0)
2022 - 2024	**Indian Institute Of Science, Bengaluru**	
	M.Tech Robert Bosch Centre for Cyber Physical Systems	(GPA: 9.32/10.0)
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

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

Skills

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

Research Publications (First Authored)

Conditional Diffusion Model with Nonlinear Data Transformation for Time Series Forecasting.
Accepted at **ICML 2025**

Gabor-Encoded Latent Implicit Neural Representations for Continuous Field Reconstruction.
Submitted to **ECAI 2025**

BiRoDiff: Diffusion policies for bipedal robot locomotion on unseen terrains.
Published at IEEE - ICC 2024

Stoch BiRo: Design and Control of a low cost bipedal robot.
Published at IEEE - ICCAR 2024

Research Publications (Co-Authored)

Inverse Reinforcement Learning based Multimodal Target Prediction for Rapid HRI.
Published at ACM - IUI 2024

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** used for accurate imputation after the transition form Frequentist approach (LSTM).

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 instantaneous velocity by predicting object's movement with optical flow vectors

Adaptive Locomotion of Walking Robots by Learning based methods   2022 - 2024
- Relevant Concepts : **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.
- Please refer to the hyperlink for recent progress.

Awards and acheivements

AI and Robotics Technology Park Fellowship 2023   Oct 2023

Top up fellowship for the Masters thesis 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