SMART INDIA HACKATHON 2022

Basic Details of the Team and Problem Statement

Ministry/Organization Name/Student Innovation: ISRO

PS Code: SS591

Problem Statement Title: Deep Learning based Cyclone Intensity estimation using INSAT-3D IR imagery

Team Name: METABYTES

Team Leader Name: Adarsh Malviya

Institute Code (AISHE): U-0555

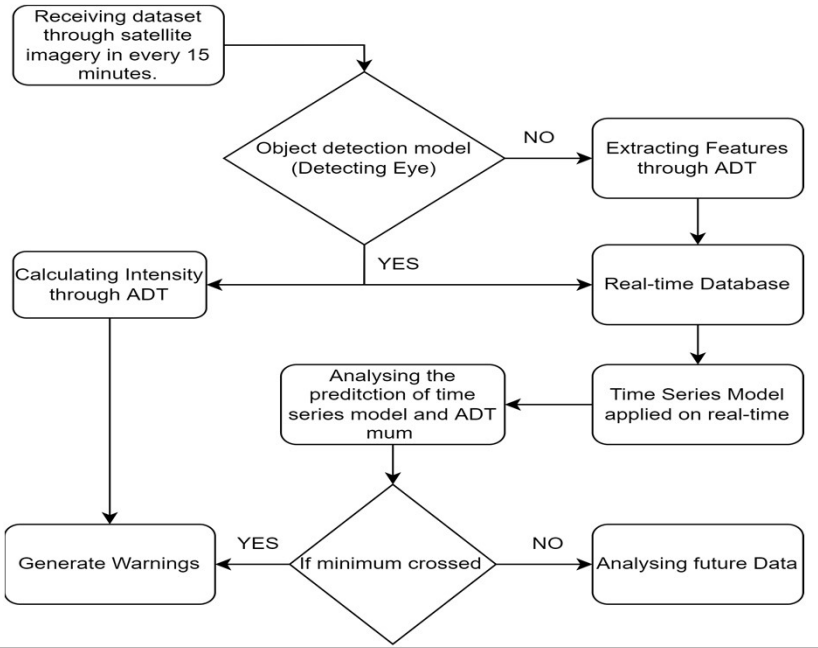
Institute Name: Graphic Era Deemed-to-be University

Theme Name: Disaster Management

Idea/Approach Details

Describe your idea/Solution/Prototype here:

- The INSAT3D Satellite's visible, infrared, and water vapour images are being used.
- Using object detection algorithms, we are building a database of Classified Cyclone Imageries.
- On the basis of model analysis, we'll pass on classified images to the ADT for feature extraction/calculation.
- The Extracted feature will be stored in a database for time series analysis.
- The Time Series model will analyse the extracted feature value and predict when the centre determination will happen in real-time.
- On the basis of prediction, we can detect the real-time cyclone formation without any need for visual confirmation.
- Developing a platform for estimating cyclone intensity with Visualization of the cyclone's course and wind speed, as well as cyclone forecast.



Describe your Technology stack here:

- Oracle19G for constructing database.
- Python, PyTorch and Jupyter Notebook for model preparation.
- Django for implementing portal backend
- HTML, CSS, JS for implementing Frontend
- AWS for storing the time series dataset and implementing DL pipeline and cloud deployment.

Idea/Approach Details

Describe your Use Cases here

- Detecting Cyclone before the actual formation based on real time analysis.
- The real time dataset that is being produced by our model can be used for further research in foracsting domain.
- Providing Early warning based on model prediction.
- Our model and dataset can be used in many business model which can help in better forcasting and estimation real time weather condition.

Describe your Dependencies / Show stopper here

- Irregularity in receiving the dataset.
- Odd values calculated while predicting mainly due to human error.
- Dependency on third party for storing the real time database.
- Stable internet connection required for Fetching data.
- Powerful system required for DL pipeline and modeling.

Team Member Details

Team Leader Name: Adarsh Malviya

Branch (Btech/Mtech/PhD etc): Btech | Stream (ECE, CSE etc): CSE | Year (I,II,III,IV): III

Team Member 1 Name: Rakshit Kaushik

Branch (Btech/Mtech/PhD etc): Btech | Stream (ECE, CSE etc): CSE | Year (I,II,III,IV): III

Team Member 2 Name: Sangam Gautam

Branch (Btech/Mtech/PhD etc): Btech | Stream (ECE, CSE etc): CSE | Year (I,II,III,IV): III

Team Member 3 Name: Rahul Khushwaha

Branch (Btech/Mtech/PhD etc): Btech | Stream (ECE, CSE etc): CSE | Year (I,II,III,IV): III

Team Member 4 Name: Jyotirmay Kapil

Branch (Btech/Mtech/PhD etc): Btech | Stream (ECE, CSE etc): CSE | Year (I,II,III,IV): III

Team Member 5 Name: Shreeja Raj

Branch (Btech/Mtech/PhD etc): Btech | Stream (ECE, CSE etc): CSE | Year (I,II,III,IV): III

Team Mentor 1 Name: Mrs. Garima Sharma

Category (Academic/Industry): Academic | Expertise (AI/ML/Blockchain etc): AI | Domain Experience (in years): 10