Idea / Approach Details

Organization Name	**:** ISRO
PS Number	**:** NM381
Problem Statement	**:** App for identification of sky regions in a photo
Team Name	**:** 1D345
Team Leader Name	**:** Prayag Bhatnagar
College Code	**:** U-0923

Idea / Approach details

The idea is to use sky region identification using image processing. The objective is to mask the sky area in white and other area in black. The implementation is achieved through image processing using OpenCV.
The scope of this idea includes, but is not limited to:

1. Vision-based ground robot navigation : This can replace payload of external hardware used for LIDAR and SONAR technologies used for navigation while also minimizing cost.
2. Identifying solar potential: This can be used to identify total sky exposure at a certain area which hence can be correlated with the potential for harvesting solar energy from that place.
3. Obstacle avoidance for unmanned aerial vehicles : Drones etc. can use this for differentiating “free space” i.e sky with obstacles.

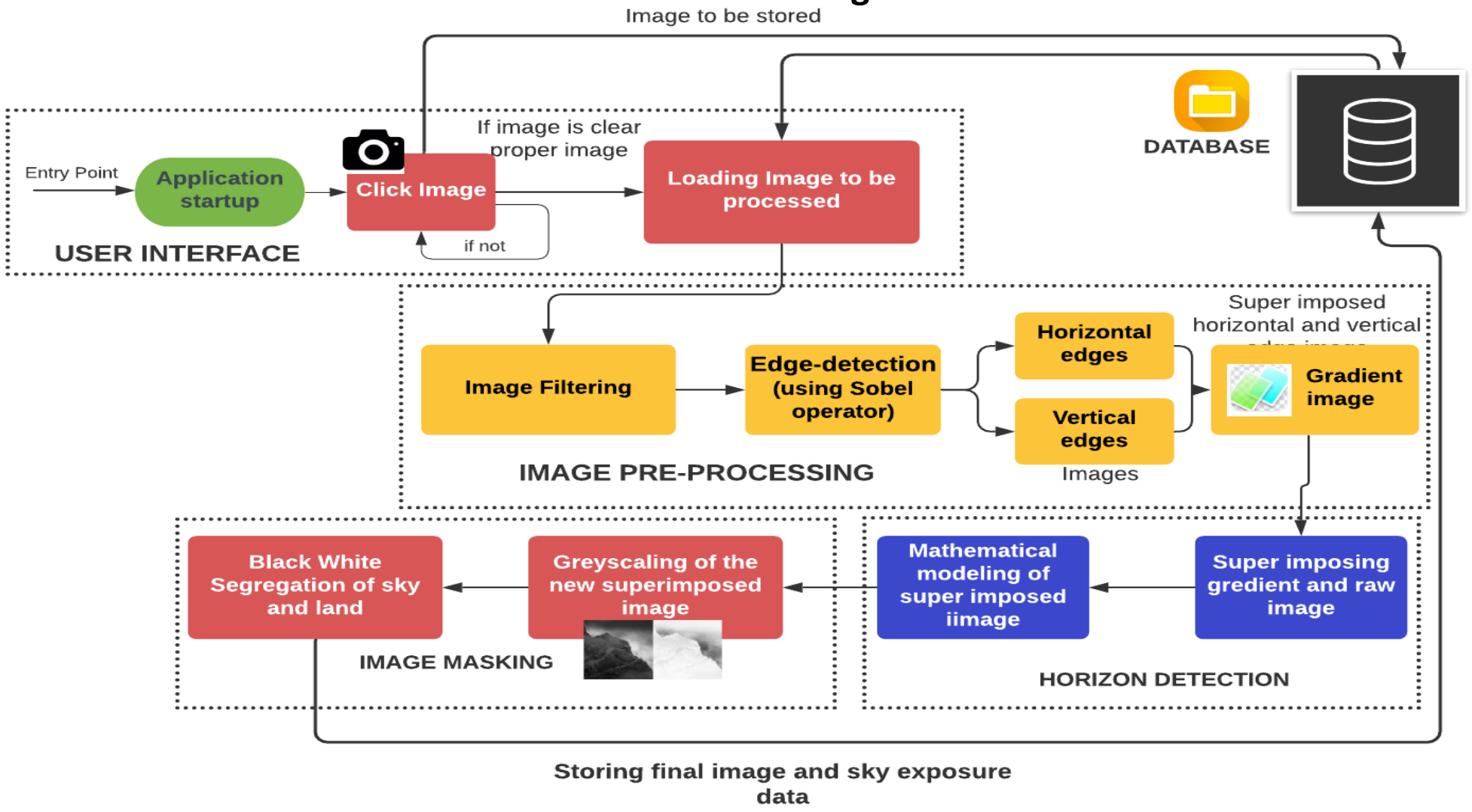
Technology stack :

- **IDEs Used: Pycharm -Text Editor, Android Studio**
- **GUI : XML**
- **Backend : Python,Java**
- **DataBase : Firebase**

- **External Libraries used:**

  OpenCV for Image processing tasks i.e. thresholding, masking, grey-scale conversion etc.
  Numpy, Scipy for mathematical modelling of the Image.
  Kivy – for mobile application with natural user interface.
  Scikit-image – for image filtering.

Architecture Diagram



Dependencies

1. Hardware for capturing Images i.e. a camera.
2. Works only in Day Time.