



PARSHVANATH CHARITABLE TRUST'S

A.P. SHAH INSTITUTE OF TECHNOLOGY

Department of Computer Science and Engineering

Data Science

“SAFER: System for Assessment and Forecasting of Emergency Risks”

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Project Guide
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1. Introduction

- A Disaster is a sudden event that causes significant damage to human lives, property, the environment, or the normal functioning of a society.
- Large-scale assistance becomes crucial to save lives, prevent injury and safeguard infrastructure.
- "**SAFER**: System for Assessment and Forecasting of Emergency Risks is a beacon of hope which provides analysis and prediction of Floods and Droughts.



- **Problem Identified:**

1. Limited historical data and analysis.
2. Inadequate predictive capabilities.
3. Areas affected by disasters are not properly known.
4. Limited community resilience.

- **Solution Proposed :**

1. Analysis using historical data.
2. Improving predictive accuracy by fetching data from API.
3. Provide maps that gives analysis on affected areas based on severity.

2. Objectives

1. To analyze previous occurred disasters and show the affected areas through maps.
2. To develop and deploy advanced predictive modeling techniques to enhance the accuracy of disaster prediction.
3. To protect and preserve the environment in the wake of disasters using analysis which will help to examine the damage to the environment.

3. Scope

1. Can be used to analyze and predict the natural disasters.
2. It can be used to identify disaster prone areas and ensuring accurate risk assessment.
3. Accurately predict the disaster at any place using real-time data which will help in disaster management.
4. In the realms of government and disaster management agencies, SAFER serves as a catalyst for efficient analysis of the previous occurred disasters.

4. Feature /Functionality

1. Analysis on past calamities and major events.
2. Provide the extent of damage of the affected areas.
3. Maps and Visualization of disaster prone areas.
4. Prediction of flood using real-time rainfall and river-discharge.
5. User-friendly interface.

5. Outcome of Project

1. User can get timeline and analysis of historical calamities.
2. User can access the maps to see the extent of damage in disaster-affected areas.
3. User can get the prediction of occurrence of the disaster.

6. Technology Stack

1. Frontend:

- i. HTML, CSS
- ii. Python 3.10
- iii. JavaScript

2. Backend:

- i. Django 4.2.5

3. Datasets:

- i. Open-meteo
 - Hourly and Daily Rainfall
 - Daily temperature and soil moisture data
- ii. Sentinel 1A , MODIS (Satellite Images)

6. Technology Stack

A) Analysis

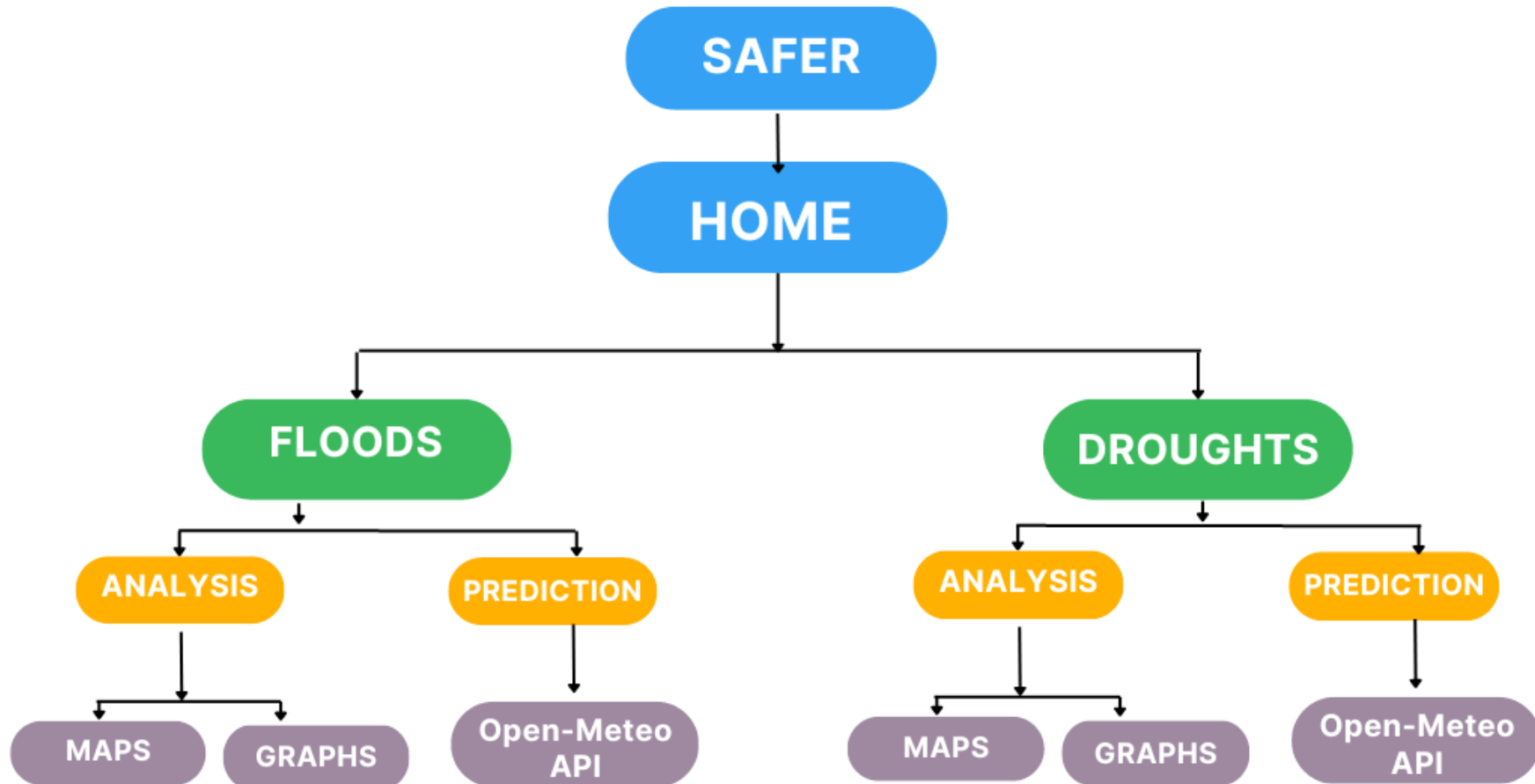
- i. Google Earth Engine – Sentinel-1A (Floods)
- ii. Google Earth Engine – MODIS (Drought)
- iii. Graphs: Data from Open-Meteo API

B) Prediction

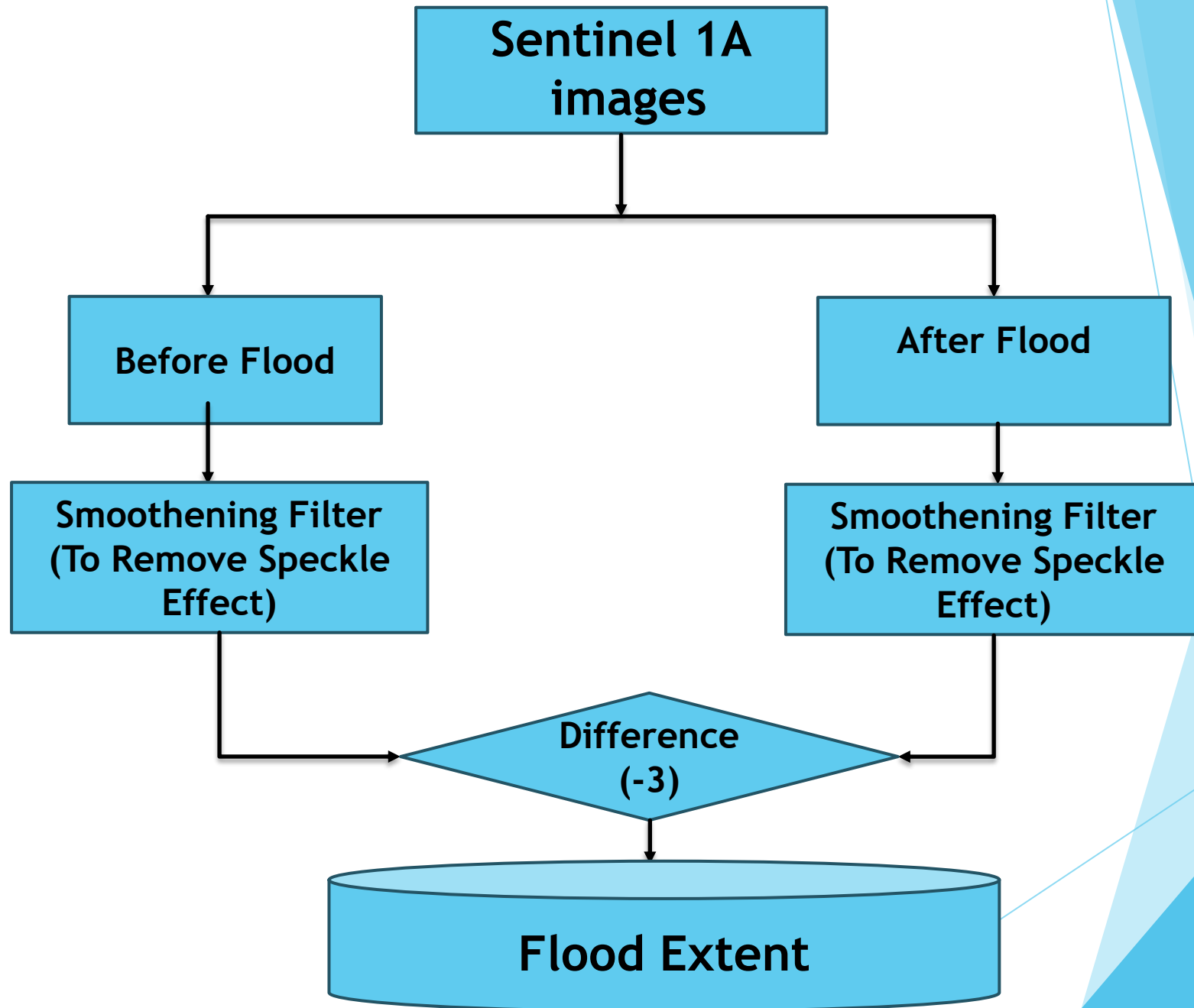
- i. Current rainfall and river discharge data from Open-Meteo API
- ii. Current temperature, precipitation, evapotranspiration, relative humidity, soil moisture, soil temperature from Open – Meteo API.

7. Block Diagram

SAFER : System for Assessment and Forecasting of Emergency Risks



7. Block Diagram-FLOOD



Thank You...!!