


Ideation Phase

Brainstorm&Idea Prioritization Template

| | |
|---------------|------------------------------------------------------|
| Date | 19 September 2022 |
| Team ID | PNT2022TMID11740 |
| Project Name | Emerging Methods for Early Detection of Forest Fires |
| Maximum Marks | 4 Marks |

Step-1: Team Gathering, Collaboration and Select the Problem Statement

Template




Brainstorm & idea prioritization

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

⌚ 10 minutes to prepare
🕒 1 hour to collaborate
👥 2-8 people recommended

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Before you collaborate

A little bit of preparation goes a long way with this session. Here's what you need to do to get going.

⌚ 10 minutes

A

Team gathering

Define who should participate in the session and send an invite. Share relevant information or pre-work ahead.

B

Set the goal

Think about the problem you'll be focusing on solving in the brainstorming session.

C

Learn how to use the facilitation tools

Use the Facilitation Superpowers to run a happy and productive session.

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1

Define your problem statement

What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.

⌚ 5 minutes


PROBLEM

How might we detect Forest Fire in a sparsely populated forest area Early ?

Emerging Methods For Early Detection Of Forest Fires

Forest fires are a major environmental issue, creating economic and ecological damage while endangering human lives. There are typically about 100,000 wildfires in the United States every year. Over 9 million acres of land have been destroyed due to household wildfires. It is difficult to predict and detect Forest Fire in a sparsely populated forest area and it is more difficult if the prediction is done using ground-based methods like Camera or Video-Based approach. Satellites can be an important source of data prior to and also during the fire due to its reliability and efficiency. The various real-time forest fire detection and prediction approaches, with the goal of informing the local fire authorities.

Technical Architecture



```
graph LR; A[Video Feed Data Capture] --> B[Frame Feed Video]; B --> C[Deep Learning Model]; C --> D[Alert]; C --> E[No Fire Detected]; E --> A;
```

Step-2: Brainstorm, Idea Listing and Grouping

2
Brainstorm

Write down any ideas that come to mind that address your problem statement.

⌚ 10 minutes

Akash J

Fire detection using CNN model

Image Processing

The neural network model is to be built

Collect dataset from different sources

Harshavardhan J

Classify images using a Convolutional Neural Network

perform video analysis to get the prediction

Activation functions can be used

Detect forest fire using UAV

Parthasarathy B

Get and prepare the dataset

Using Digital Camera

Monitoring the forest

Detection Using wireless sensor Network

Vinoth R

Image Preprocessing

Satellites can be an important source of data

capture the live stream with a camera

Collection of data using satellite

Vaishnavi T

OpenCV for video processing

Camera or Video-Based approach

Using optical sensor

Deep Learning can be used

3
Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.

⌚ 20 minutes

Cluster 1 (Detection)

Detect the fire using the Sensors

Make an alert system based on that

Use the image processing & CNN

Cluster 2 (Model Building)

Initializing the model

Adding CNN Layers

Training and testing the model

Save the Model

Cluster 3 (Video/Image Processing)

OpenCV for video processing

Define the parameters / arguments

Read images using OpenCV.

Step-3: Idea Prioritization

4
Prioritize

Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

⌚ 20 minutes

Importance

♥

If each of these tasks could get done without any difficulty or cost, which would have the most positive impact?

Feasibility

Regardless of their importance, which tasks are more feasible than others? (Cost, time, effort, complexity, etc.)

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- 4 **Team gathering**
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- 5 **Set the goal**
Think about the problem you'll be focusing on solving in the brainstorming session.
- 6 **Learn how to use the facilitation tools**
Use the Facilitation Supplements to run a happy and productive session.

[illegible][illegible]

Group Ideas

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```

graph LR
    subgraph Cluster_1 [Cluster 1: Detection]
        direction TB
        C1_1[Connect the camera and the system] --> C1_2[Make an alert system with an alarm that]
        C1_2 --> C1_3[Train the model using CNN]
    end

    subgraph Cluster_2 [Cluster 2: Model Building]
        direction TB
        C2_1[Installing the model] --> C2_2[Adding CNN Layers]
        C2_2 --> C2_3[Training and testing the model]
        C2_3 --> C2_4[Save the Model]
    end

    subgraph Cluster_3 [Cluster 3: Video/Image Processing]
        direction TB
        C3_1[OpenCV for video processing] --> C3_2[Define the parameters / arguments]
        C3_2 --> C3_3[Read Images using OpenCV]
    end
  
```

The diagram illustrates the workflow of a computer vision application, organized into three main clusters:

- Cluster 1: Detection**
 - Connect the camera and the system
 - Make an alert system with an alarm that
 - Train the model using CNN
- Cluster 2: Model Building**
 - Installing the model
 - Adding CNN Layers
 - Training and testing the model
 - Save the Model
- Cluster 3: Video/Image Processing**
 - OpenCV for video processing
 - Define the parameters / arguments
 - Read Images using OpenCV

Prioritize
Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

The diagram illustrates the trade-off between the importance of a task and its feasibility. The tasks are categorized as follows:

- High Importance, Low Feasibility (Below the curve):**
 - Image / Video Processing
 - Prediction Using Machine Learning
 - Collect the dataset or create the dataset
- Low Importance, High Feasibility (Above the curve):**
 - Initializing the model
 - Configure the Learning Process
 - Video Analysis