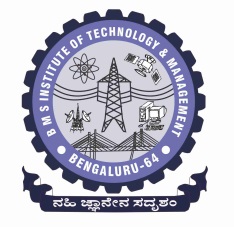
BMS INSTITUTE OF TECHNOLOGY & MANAGEMENT BANGALORE-560064



**Students Project Review and Assessment Committee**

**Intermediate Report-Phase II**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Batch No:** | | **Guide Name:** | | **Submission Date:** |
| **Project Title** | | | | |
| **Sl No** | **USN** | | **Name** | |
| **1** |  | |  | |
| **2** |  | |  | |
| **3** |  | |  | |
| **4** |  | |  | |
| **Project Execution Place** | | | **In-house /Industry**  **Details of The Industry and External Guide (Name, Designation, Mail-Id, Contact No, Acceptance Letter to be enclosed)** | |
| **Project Category** | | | **Research, Environmental and Societal, Product development , Industrial Live Project, Application Project, Case Study** | |

**Signature of Guide HOD**

*Content of Report*

**Abstract of Project:** (1 paragraph not more than 300 words) **–Brief description of Project.**

…intro on need for nutrient management. We propose to develop an application that uses the leaf images of crops like rice, wheat and maize to identify nutrient deficiencies like Potassium,Magnesium,Zinc,Iron,Manganese,Copper,Boron,Sulphur,Nitrogen deficiency levels (only for rice) and recommend appropriate fertilizer/nutrient management techniques.

**System Analysis or Requirement Analysis**

**The overall process of project – diagram and description.**

**Mapping of requirements to the subsystems or modules chosen.**

**Functionalities of the system and Subsystem.**

for rice

Home page – description and navigation to individual pages

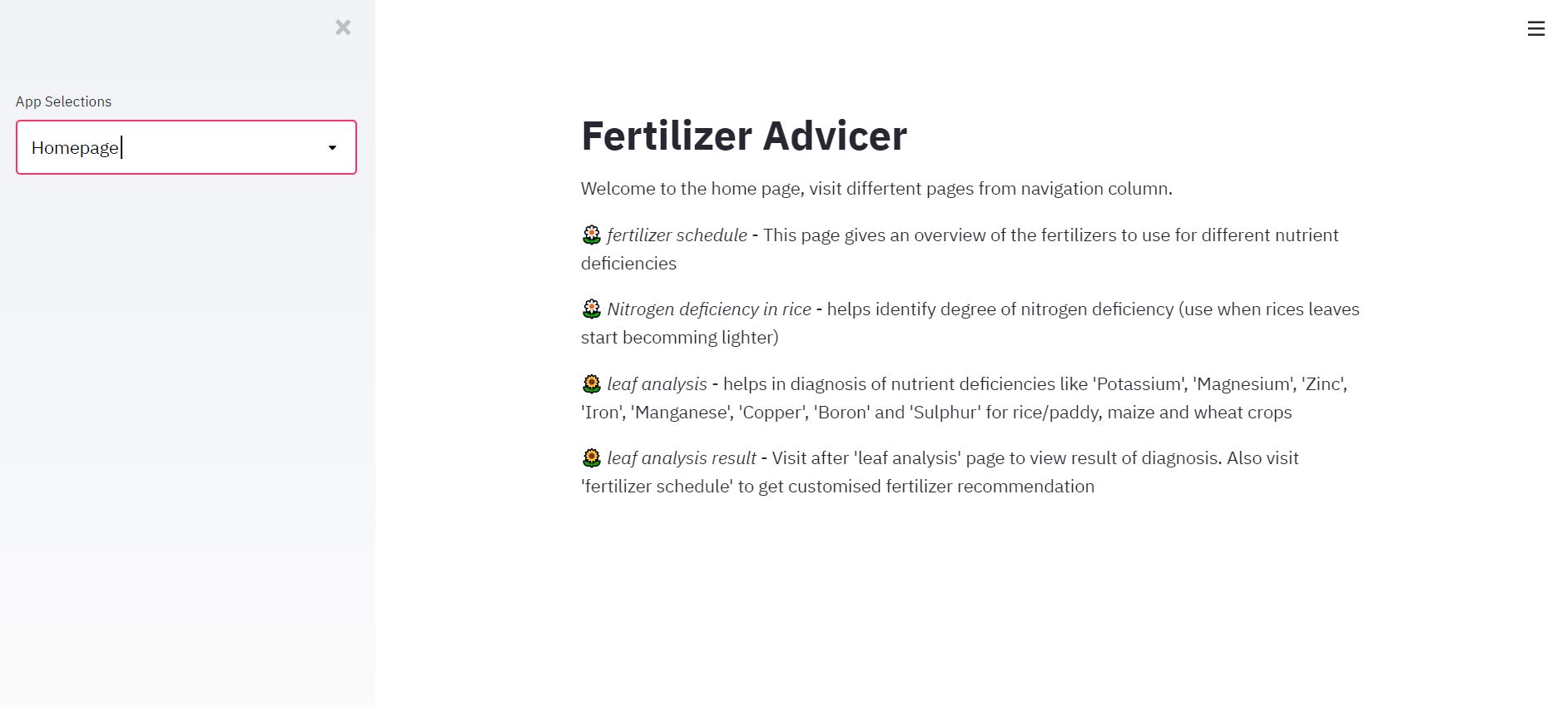


Figure Home page

fertilizer schedule - This page gives an overview of the fertilizers to use for different nutrient deficiencies

-Select land size

- Stage of growth (sapling/established/flowering)

-Crop type (rice/maize/wheat)

Defalut shows fertilizers recommended for all nutrients deficiencies focused on.

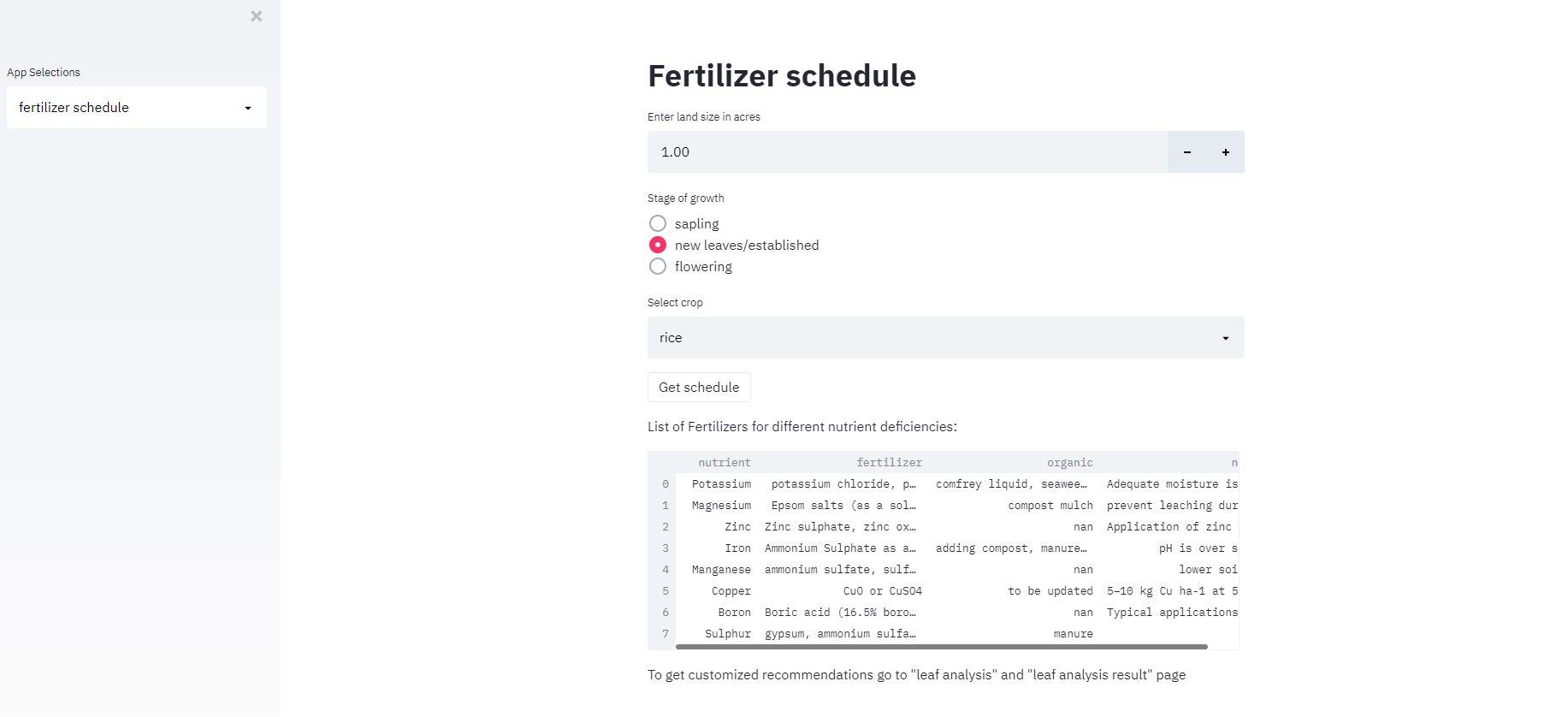


Figure General Fertilizer schedule for all nutrients

Nitrogen deficiency in rice - helps identify degree of nitrogen deficiency (use when rices leaves start becomming lighter)

Option to upload rice leaf image (taken in white background)

Neural network model run on backend to classify the image into (1 of 4, 'swap1','swap2','swap3','swap4) categories based on the Leaf Color Chart for rice.

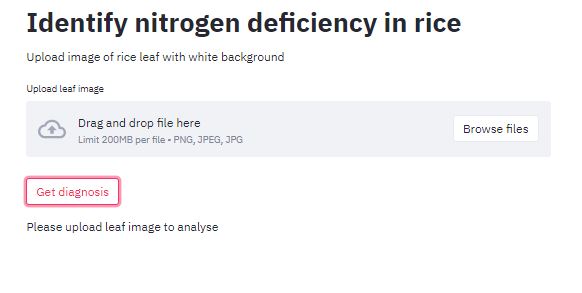


Figure Pae to upload image of rice leaf for nitrogen deficiency detection

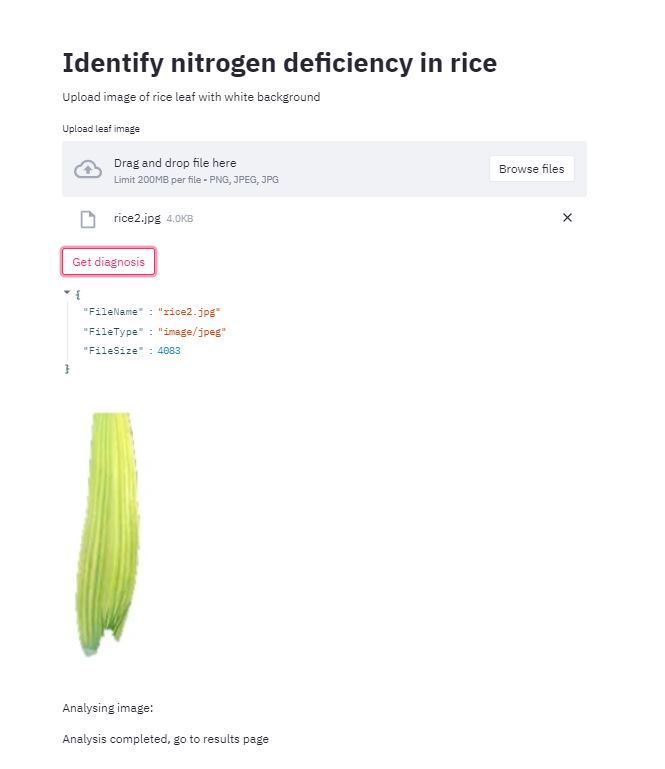


Figure Page after uploading image

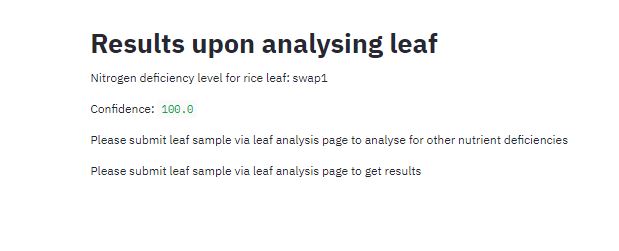


Figure Model results for uploaded rice leaf

leaf analysis - helps in diagnosis of nutrient deficiencies like 'Potassium', 'Magnesium', 'Zinc', 'Iron', 'Manganese', 'Copper', 'Boron' and 'Sulphur' for rice/paddy, maize and wheat crops

* Choose age of leaf (mature/old, new/young, middle)
* Choose crop (r,w,m)
* Upload image of leaf with white background
* Click button to get diagnosis
  + Nn model trained to classify an image into the following categories (normal, spotty, margin, interveinal, tip) is run
  + 

Figure Image of Maize leaf with label as tip

Figure Image of wheat leaf with label as spotty



Figure Wheat leaf with label as normal



Figure Rice leaf with label as margin



Figure Maize leaf with label as interveinal

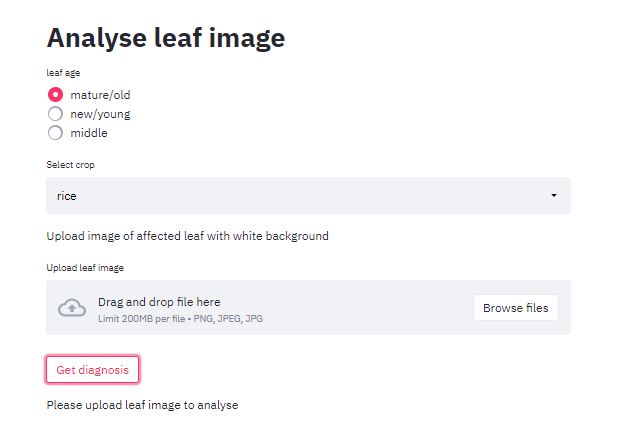


Figure PAge to upload leaf image and select crop details

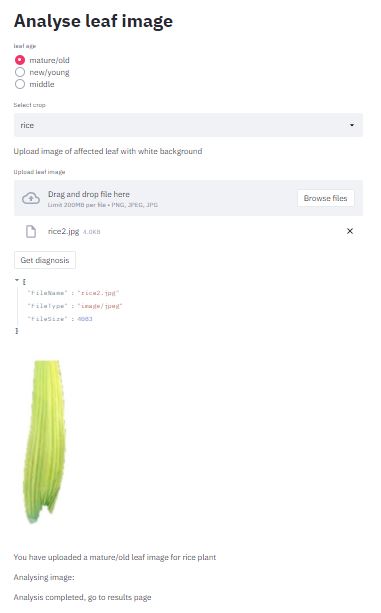


Figure PAge after uploading image

leaf analysis result - Visit after 'leaf analysis' page to view result of diagnosis. Also visit 'fertilizer schedule' to get customised fertilizer recommendation

Here some human inut is collected to further specialize the classification. General question about plant asked:

-Does the plant show stunted growth

- Are there Red/dead spots on leaves

- Are the leaves twisted/brittle

- Is there a general yellowing of leaves observed

Along with answers to these questions and the results of the modle, nutrient deficiey if identified is displayed.

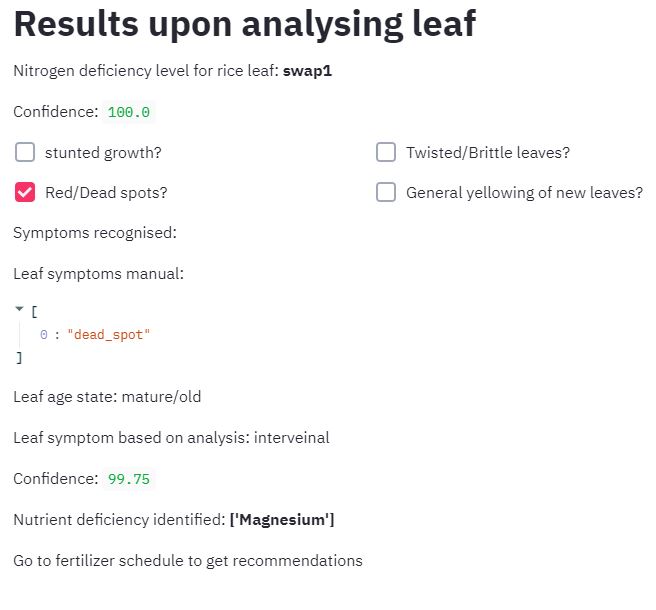


Figure Results page where the machine learning model results are displayed and the nutrient deficiencies are diagnosed



Figure Message displayed when result page accessed before uploading image

The user can now navigate back to the fertilizer recommendation page to get the customised data on which fertilizers to use.

TODO :

1. More details for recommending fertilizer, based on lad size, crop type, and age of crop
2. Can add a page to help farmer track their crops and when they have applied fertilizer, and when next fertilizer application is scheduled

(Should we mention this in report? Or not required?)

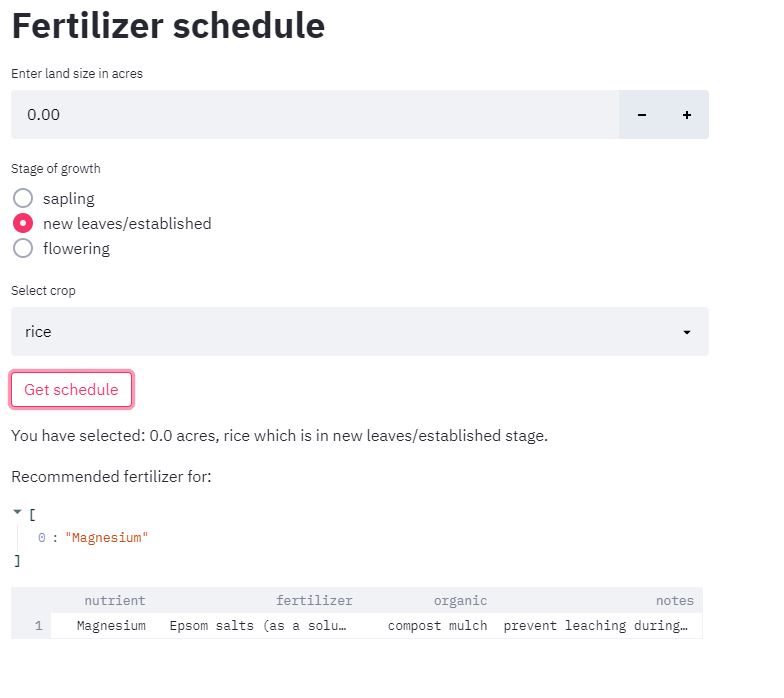


Figure Customised fertilizer recommendation based on model results

Figure Logic for diagnosing nutrient deficiency

**System Design**

**Architectural design – Level 0 DFD or block diagram showing the system and its subsystem.**

Tensorflow lite model for rice lcc (mobile application also available)

Streamlit – python app for front end

Database – CSV files to store nutrient – fertilizer data

TensorFlow – Keras neural network model – for leaf classification

**Component design – level 1.. n DFD where each level reveal the details or if the project is Object oriented design then can be specified using Class diagram.**

Home page – description and navigation to individual pages

fertilizer schedule - This page gives an overview of the fertilizers to use for different nutrient deficiencies

-Select land size

- Stage of growth (sapling/established/flowering)

-Crop type (rice/maize/wheat)

Defalut shows fertilizers recommended for all nutrients deficiencies focused on.

Nitrogen deficiency in rice - helps identify degree of nitrogen deficiency (use when rices leaves start becomming lighter)

Option to upload rice leaf image (taken in white background)

Neural network model run on backend to classify the image into (1 of 4, 'swap1','swap2','swap3','swap4) categories based on the Leaf Color Chart for rice.

leaf analysis - helps in diagnosis of nutrient deficiencies like 'Potassium', 'Magnesium', 'Zinc', 'Iron', 'Manganese', 'Copper', 'Boron' and 'Sulphur' for rice/paddy, maize and wheat crops

* Choose age of leaf (mature/old, new/young, middle)
* Choose crop (r,w,m)
* Upload image of leaf with white background
* Click button to get diagnosis
  + Nn model trained to classify an image into the following categories (normal, spotty, margin, interveinal, tip) is run

leaf analysis result - Visit after 'leaf analysis' page to view result of diagnosis. Also visit 'fertilizer schedule' to get customised fertilizer recommendation

Here some human inut is collected to further specialize the classification. General question about plant asked:

-Does the plant show stunted growth

- Are there Red/dead spots on leaves

- Are the leaves twisted/brittle

- Is there a general yellowing of leaves observed

Along with answers to these questions and the results of the modle, nutrient deficiey if identified is displayed.

fertilizer schedule - This page gives an overview of the fertilizers to use for different nutrient deficiencies

-Select land size

- Stage of growth (sapling/established/flowering)

-Crop type (rice/maize/wheat)

Defalut shows fertilizers recommended for all nutrients deficiencies focused on.

**Behavioral design – process diagrams or if the project is Object oriented design then can use sequence diagrams.**

Figure User flow diagram

**References: (IEEE format) – what you referred?**

*Note: The gray colored text is the hint of what information is expected in that section*

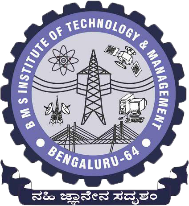
**Common guidelines for preparing Synopsis**

* Each page should have header and footer
  + Header – Project Name (LHS) and Page No (RHS)
  + Footer - BMSIT&M, Dept Name(LHS) and year of submission(RHS)
* Use Times New Roman Font type
* All the main headings should be 16’’ Bold
* All the sub headings should be 14’’ Bold
* All running text should be 12’’ Justified and 1.5 line spacing
* Do not underline
* All the abbreviations has to be expanded when they are used for the first time and can be abbreviated in further use
* Use the common cover(first) page **– see next page**

Note: In prior guides signature is required in this report SPARC committee members will sign on the day of presentation

BMS INSTITUTE OF TECHNOLOGY & MANAGEMENT

Yelahanka, Bangalore – 560 064

****

Department Name

Intermediate Report for the Project work

“Project Title”

Submitted By:

1. Name & USN

2. Name & USN

Under the Guidance of

Guide Name

2020-2021