INSPESTOR

INSECT PEST DETECTOR ON RICE FIELDS

A USER MANUAL FOR THE INNOVATIVE MOBILE APP REVOLUTIONIZING PEST MANAGEMENT IN AGRICULTURE

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INSECT PEST IDENTIFICATION APP WITH PRESCRIBED PESTICIDE IN RICE FIELDS USING SINGLE SHOT DETECTOR MOBILENET MODEL ON DEEP LEARNING

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TABLE OF CONTENTS

INTRODUCTION

Inspestor: A mobile application that uses deep learning algorithms and image recognition technology that aims to assist farmers to detect and identify insect pest on rice fields. Once detected, Inspestor can recommend the most effective pesticide to use, helping farmers to better manage their crops and get the best yield possible.

INSTALLATION

- Download the Inspestor APK file at https://bit.ly/3JeQsyr
- Install the file, an alert dialogue will ask for permission to install unknown sources, click “Allow“ or “OK“. This will allow the application to be installed.

USER PRIVILEGES

Following features can be availed by the user.

• View name of the captured insect pests
• View recommended pesticides on the output
• View lists of the insect pest on the Library button
• View Insect Pest details on the Pest Information button

INTRODUCTION cont.

SYSTEM REQUIREMENTS

Minimum Mobile Hardware Specifications
Android version: Android 7
Camera MP: 13 MP
System type: Android
CPU: At least 1.25 Ghz
RAM: 3 GB

Current Mobile Hardware Specifications
Android Version: Android 7 to 12 API level 24-32
Camera MP: 13MP to 48MP
System type: Android
CPU: 1.25 GHZ to 2.0 GHz
RAM: 3GB or 8GB

Current IDE Specifications for Front-End
Android Studio Version: Bumble Bee v.1
Minimum SDK: 23
Target SDK: 32
Java version: 1.8

Software Development Requirements

Training and development process of the system , the researchers used Google Colab Pro running on a desktop with a hardware specification of CPU: AMD Ryzen 5 2400G with Radeon Vega Graphics, GPU: NVIDIA GeForce GTX 1060 6GB VRAM, RAM: 16 GB, and Storage: 2TB HDD.
While in designing the user interface and overall layout of the mobile application, the researchers used Android Studio running with a laptop with AMD Ryzen 5 3500U with Radeon Vega Mobile Gfx 2.10 GHz, installed RAM 16.0 GB (13.9 GB usable), system type 64-bit operating system, and x64-based processor.

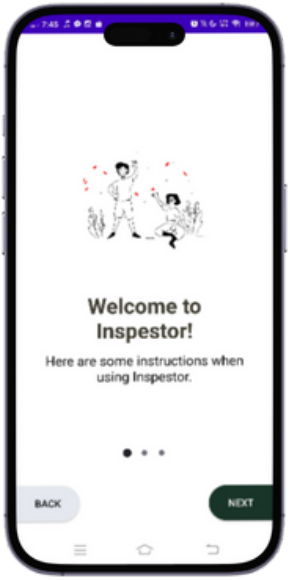
GETTING STARTED

SPLASH SCREEN

Inspestor: A mobile app employing deep learning and image recognition to detect and identify insect pests in rice fields, providing farmers with recommendations on the most effective pesticides for optimal crop management and increased yields.

ONBOARD SCREEN

The app logo will flash, followed by a helpful onboard screen with instructions on how to use the app. Use "NEXT" or "BACK" buttons to navigate.



GETTING STARTED

Library

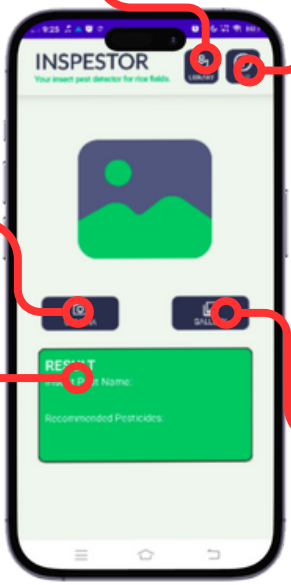
which displayed a list of the major insect pests used in this study. Each button was clickable, allowing users to read more about each insect pest.

About Us

depicts the app's data, including the researchers behind the app's development, as well as the sources of info used in the app.

Camera

Tap "CAMERA" to take insect pests photos with your phone's camera. View the captured image. Click "Retry" for a better shot or "Ok" to proceed.



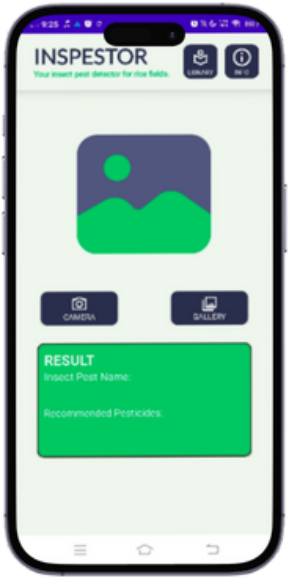
Gallery

After selecting the "GALLERY" button, you will be directed to your device's album or gallery. From there, you can choose any picture and upload it.

Result

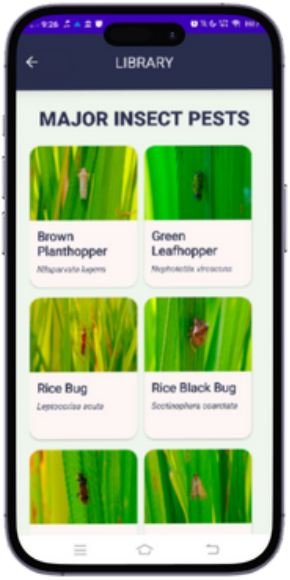
displays the final output whether the image selected was an insect pest or not. If the image is not an insect pest, it will indicate "NOT IN LIST" message. While the image of insect detected will output an insect pest name and its recommended pesticide.

GETTING STARTED



HOME SCREEN

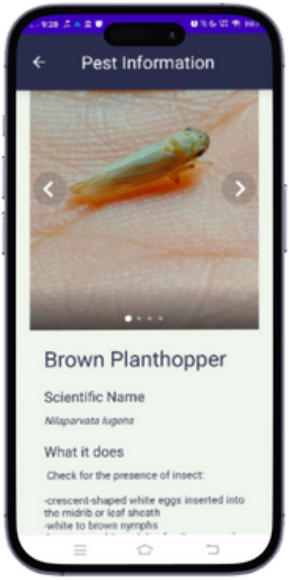
After the onboard, you will be directed to “Home” screen and you can capture/upload an image using your phone's camera/gallery. It will then provide an insect pest and pesticide information in the “RESULT”. You can explore the “LIBRARY” and “INFO” sections too.



LIBRARY SCREEN

The "LIBRARY" button shows the app's list of detectable insect pests. Click each button to learn about them, including the recommended pesticides and its active ingredients.

GETTING STARTED



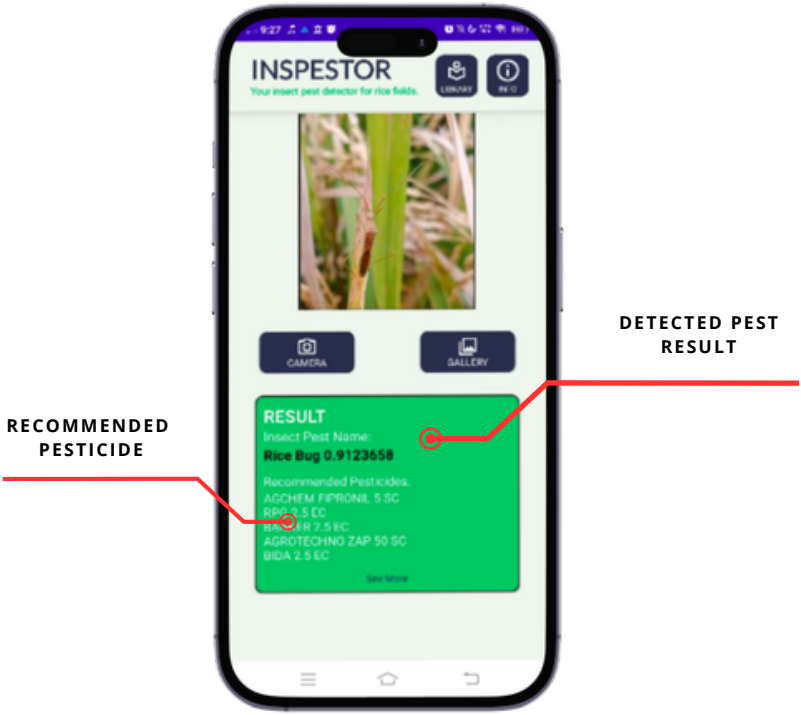
PEST INFORMATION SCREEN

Clicking insect pest in the library takes you to the "Pest Information" tab. It displays the pest's scientific name, behavior, recommended pesticides, active ingredients, and pest management details.

USER INSTRUCTIONS SCREEN

Tap "INSTRUCTIONS" for easy-to-follow steps on using the app to capture photos and achieve accurate results.

GETTING STARTED



After clicking "Ok," the app analyzes the photo and identifies the insect pest. You'll then see the "Home" screen with the captured image, pest information, confidence level, and pesticide recommendations in the "RESULT" section. Tap "See More" to access detailed information about the insect pest, including active ingredients and recommended pesticides. You'll be directed to the "LIBRARY" button for this.

INSTALLATION OF SOURCE CODE

To run the source code (mobile app) from GitHub repository, follow the following steps:

1. Clone the GitHub repository:
   - Open your terminal or Git Bash.
   - Navigate to the desired directory where you want to clone the repository.
   - Run the following command to clone the repository: git clone https://github.com/khrysmadei/Inspestor_App.git

2. Open Android Studio:
   - Launch Android Studio on your computer.
   - If you don't have Android Studio installed, download and install it from the official Android Developer website (https://developer.android.com/studio).

3. Import the project into Android Studio:
   - In Android Studio, click on "File" > "Open."
   - Navigate to the directory where you cloned the repository and select the project's root folder.
   - Click "OK" to import the project.

4. Build the project:
   - After importing the project, Android Studio will start building the project automatically.
   - Wait for the build process to complete. You can monitor the progress in the "Build" window at the bottom of Android Studio.

INSTALLATION OF SOURCE CODE

5. Set up an emulator or connect a physical device:
    - You need to have an Android emulator or a physical Android device connected to your computer to run the application.
    - To set up an emulator, go to the Android Virtual Device (AVD) Manager in Android Studio. Create a new virtual device or select an existing one and click "Next" to finish the setup.
    - If you prefer to use a physical device, connect it to your computer using a USB cable and make sure USB debugging is enabled in the device settings.

6. Run the application:
    - Once the build is successful and you have an emulator or device connected, you can run the application.
    - In Android Studio, click on the "Run" button (usually a green triangle icon) located in the toolbar or go to "Run" > "Run 'app'".
    - Select the target device from the available emulators or connected devices if prompted.
    - Android Studio will install the application on the selected device and launch it.

That's it! You have successfully run the Inspestor application. Get ready to indulge in its remarkable features.

TROUBLESHOOTING

Experiencing problems with Inspestor? Choose a scenario you are currently experiencing and follow the steps that may solve the problem.

A. The application keeps crashing
The application supports only Android 7 version and above. If the application keeps crashing, please make sure to update your android version.

1. Uninstall the current application
2. Update android version
3. Install Inspestor again

B. The application system lags, or delay response
Users may experience delay response this may cause by phone low storage. Clearing the application cache may help the
system lag problem.

FREQUENTLY ASKED QUESTIONS (FAQS)

Can the app detect all types of insect pest?
No. The Inspestor application can only detect six types of insect pests. These are Rice Bug, Rice Black Bug, Rice Grain Bug, Brown Planthopper, Green Leafhopper, and Leaffolder.

Is the application available for iOS?
No. Inspestor application is only available on Android devices.

Is Inspestor free to download and use?
Yes. The Inspestor application is free to use and download for everyone that can meet the app's system specifications.

Do I need internet in order to use the app?
No. Internet is not required in order to use the application.

How many pesticides you recommend on each insect pest?
The app provides a maximum of five recommended pesticide with specific active ingredients and brand names that is commercially available in the market.

Where do you store our user data?
Since the app is offline, it does not store any user data. Moreover, the app does not require users to sign up or log in so anyone can use it.

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