Documentation

Sparktech

Animal detection and prevention system

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1 Team members

- Miguel Rodriguez
- Shao-Wen Chang
- Asadujaman Nur
- Vincent Obigwe

2 Introduction

The population of human civilization is increasing rapidly. With this growing population, we need many lands for farming, resident and industrial purposes. Thus, we have been chopping down the forests to support this huge demand for the lands. Although it is solving many problems for us, it is creating many issues by endangering the animal life and forcing them to relocate their natural habitats, which leads them to move closer and closer to people and our habitat. Which causes unexpected fatal accidents.

The problem we are facing is, due to lack of their natural habitats, they, for example deer, are living near firms and woods. In addition, sometime they like to hide or take shelter from people if they get scared or are if they are injured. Sometime they sleep and rest inside those lands. Which can be

a huge problem. Since they are deep inside the firming lands, the firmer and the animal rescuers do not know their stances; therefore they cannot provide support or perform rescue operation in case they are in need of support. Even worst, during the harvesting season, if they are injured(Animals) and decides to have shelter inside the fields such as corn ones and cannot move due to their injuries or too weak, and farmers starts to harvest the corps, sometimes they just run over their tractor on the poor animals without knowing their presence and killing them as a result. This can be avoid by the help of technology.

To solve this issue and save the wildlife, we are going to develop a system, which will detect the animals hiding inside the fields and transmit the data to a receiver to either the farmer or the animal rescuer. So that they can take necessary action to save their life. Here in this project we are going to develop a prototype model using sensors and micro controllers to approach this problem. We will discuss more about the components we will use, methods and implementation in details below.

3 Concept Description

The project will be divided in two main parts, a detection drone, and an alarm receiver, the drone will be in charge of searching and finding the target, or objective, and the receiver will alert, and give the position of the target as soon as it has been detected.

The detector, for the realization of the project, will be equipped with an ultrasonic sensor, an infra red detector, a microphone and a location detection, in this case a deca Wave ultra wide band sensor to simulate the global position detection; and the receiver will be equipped with a buzzer and a red-green led Fig 1.

4 Project / Team management

In carrying out our project, we consider project management as an important aspect that helps us in realizing the goal and objective faster. Project management benign the application of various methods, skill knowledge and experience to achieve a detailed object that has already been set and marked as the project acceptance benchmark. It is also very important that time

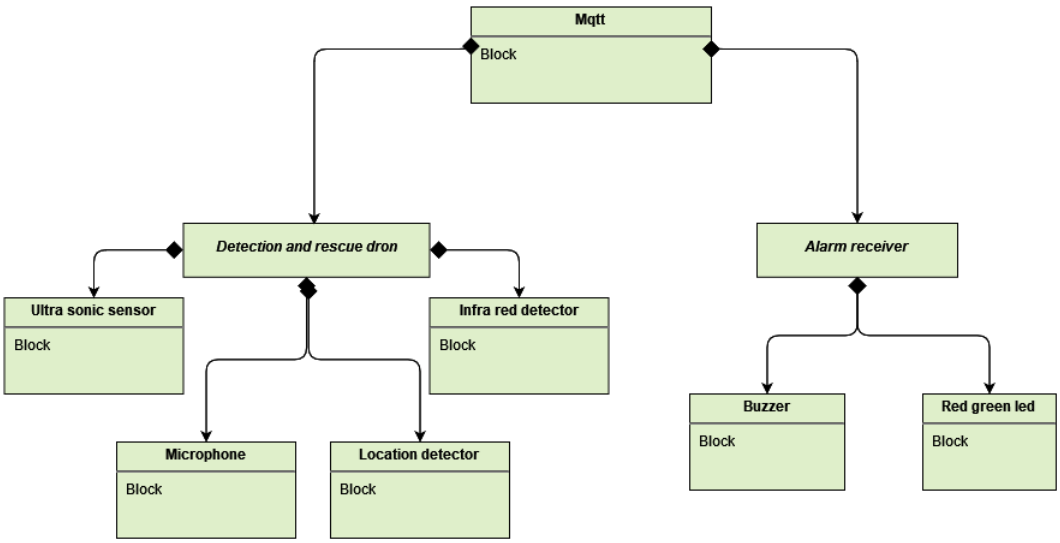

Figure 1: Block Diagram

and budget are considered. As students we embarked on this project with the focus on managing time and delivering the best result given the limited amount of time that and the no budget we deal with. Having this in mind, we decided to approach the whole project using the agile project management.

Agile project management is known as an iterative means of delivering a project throughout a given life cycle. There life cycle are made up of several iterations that are all geared towards the completion of the project. This leads to us having weekly meetings to analyze tasks and evaluate progress. With Agile project management, continuous improvement and development is the goal, to enable the project to get better on further iterations. While using Agile project management, we made use of Kanban framework to be able to achieve our project.

Kanban is a framework on agile project management that is deals with growth changes and the need for continuous process improvement. The core practices involved in using Kanban are: 1. Visualization of tasks in a board like manner with tools such as excel. 2. Reduction of work in project by introducing changes incrementally 3. Management of the flow of to-dos 4. Defining processes and tasks clearly 5. Enhancing the process of feedback to enable improvement of the system. 6. Improving workflow all together. To be able to properly visualize our tasks and clearly see what each member of

the group has to do, we made use of GitHub projects. GitHub projects can be seen as a customizable spreadsheet that helps us integrate tasks with GitHub in our repository. It empowers more customization by enabling filtering; sorting, grouping and working with GitHUb pull requests. It further looks static with the addition of colors to determine the various stage each task is.

5 Technologies

The technologies to detect the animals are going to be based in a set of sensors that will transmit using MqTT to both the farmer and the animal rescue teams.

The sensors will include infra red sensors, and a microphone; and for simulating the alarm system a buzzer and a sound emitter and a 2 color LED module.

6 Implementation

7 Use Cases

1. Infra-red sensors sense the animals and track their movements. 2. User can check and ensure the status of animals from infra-red receiver 3. User can make assessments from the observation and thus take action

References

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