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A.

CONCEPTUALIZATION

The device is going to serve as a container for drones. It should contain at least 15 drones . It would deploy them when instrructions have been given by the user.

The machine is going to have a monitor to enable effective program and user communication and a console for the user to give feedback to the machine.

SPECIFICATION

When the device is purchased a verification code is given to the user. Each machine would have a different code. This code enables you to access the service and set your password.

The verification code is also useful in the event that you want to change your password.

The drones in the device would be equipped with sprinklers and infrared sensors. The purpose of the infrared sensor is to measure the temperature of the soil while in flight. Each drone would be assigned a fraction of the farmland to work with. For tasks that more or less require each drone to measure a particular measurand (e.g moisture content of the soil or its temperature) the actual value is going to be the mean of all the data gathered by the drone.

The drone's water is gotten from a tank. The amount of time the drones should take can be specified and they achieve this by calculating the speed each should move at. By dividing the perimeter of their allocated portion by the time.

Naturally, before the drones water the farmland they would refill at an overhead tank which our technicians would equip with sensors, an alarm system and processor and add it to the network that the other devices are on for effective communication.

When the sensors detect no water the alarm would sound.

DESIGN

The design i.e the flowchart and algorithm would be in C.

TESTING AND DEBUGGING

The errors in the program were checked by testing it at various stages by using test data and diagnostic tools such as step-in, step-out and break points.

UPDATES

The device has been given the ability to use internet services and when updates are available the user will notified via e-mail.

B.

HARDWARE

1. The control: This consists of a screen, console and a housing for drones.
2. Drones: They are unmanned aircrafts that this system would use to execute most of its operations. The drone have infrared sensors to measure temperature. It can also be used to measure moisture content (MC). The hygrometer produces values for MC by giving to the resistance of soil to electric current. The scale has already been calibrated by using the resistances of wet soil and dry soil.

3. Sprinklers: The drones are equipped with sprinklers to aid them in watering the farmland.

SOFTWARE

1. GUI: The main device has a graphical user interface that facilitates smooth interaction between the user and program.
2. Access restriction via password
3. The ability of the drone housing to communicate with the drones and other hardware connected to the network
4. Ability to download updates

C.

ALGORTHM

1. START
2. Print (" Enter verification code")
3. If(inputted verification code is the actual verification){
   Display(' Divide farmland into different portions')
   Display ("Welcome please pick task")
4. int x
5. Print ('1. Read soil temperature
   2. Determine the moisture content of the soil
   3. Water the soil ')
6. Read x
7. If(x=1) {int y

   Display ('1. Deploy one

   2. Deploy a drone for each')

   If (y=1) {Perform 1st task}

else {Perform 2nd task} }

8. else if(x=2){ int z;

Display (1. Deploy one drone

2. Deploy a drone for each portion of the

Farmland ‘)

9. if (z=1) {Deploy one}

10. else {Deploy one for each}

11. int MC1, MC2…MCn, TrueMC //n is the number of portions the farmland has been divided into

12. TrueMC= (MC1+MC2+…+MCn)/n

13. Display (TrueMC)}

14. else if(x=3) {int a, VolumeOfWaterInTank;

Display (‘1. Deploy one drone

2. Deploy one for each ‘)

if (a=1) { Deploy one}

else {Deploy one for each}

if (VolumeOfWaterInTank=0) {Sound the alarm} }

15. Display (‘Thank you. Do u wish to perform any other task?’)

16. string f;

17. If(f=Yes){ Go to line 5}

18. else{ Shut down}