

Smart India Hackathon 2020

E-Market place for tribals to promote, sell, market their products

Problem ID: DN260

Technology Bucket: Software web app development

Category: Software

Team Members:

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Idea/Approach Details

Ministry/ Organization name: Ministry of Tribal Affairs

Problem Statement : E –Marketplace (Like Amazon, flipkart) wherein tribals can promote, market and sell tribal produce such as handicrafts, arts, paintings, minor forest products etc. on line with provision of delivery and e-payment and promotional discounts.

Team Name : Tech Radars

Team Leader Name : Bobba.Sree Swetha

College Code : 1-3514189218

Idea / Approach details

Prototype:

An interactive website with two different UIs are developed and provided for the customer and the tribal people. The customer UI has all the functionalities with different blogs, products, their prices and description along with customer rating. The Tribal UI has few options like updation of new products, their prices and their promotions. If the stock of a particular product is below its threshold, a notification will be sent to the tribal people to increase the stock. The payment for a product is directly transferred to the tribal's account. Data mining techniques are used to analyse the sales and to boost the production. To provide ample scope globally for tribal products.

Technology stack:

Python3 (Google Traslator API)

Django

MySQL

Apache HTTP server

Idea / Approach details

Use Cases:

- The website will display different products, their prices, their description.
- Customer can place an order of products available and can also be tracked.
- The website provides uniqueness through different blogs about the products being sold.
- Through this we provide a hassle free delivery and easy return policy.
- Newly registered customers can avail best discounts which boosts tribal products marketing.

Dependencies:

- We can use google Loon LLC (or) similar technologies to provide network connectivity.
- Efficient payment gateway.
- Establishing a central hub in their area to access the application.

Team Member Details

Team Name: TechTycoons

Team Leader Name: Gathram Sowmya Sree

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IDEA/APPROACH DETAILS

Ministry/Organization name :ARAI

Team Name : TechTycoons

PS NUMBER: UK151

Team Leader Name: Gathram Sowmya Sree

College Code: 1-3514189218

Problem Statement :

The participating teams are required to come up with a system that doesn't allow tampering with ignition systems of 2W and also prevents fuel theft etc. The system needs to warn the owner about the tampering of the 2 wheeler ignition key/fuel knob etc. when the parking mode is ON. The teams shall develop a mobile application for warning the user/owner. The vehicle should not start when the ignition key switch is tampered with.

If the vehicle is lifted during parking mode, the app should alert the user/owner through the app and also track the vehicle.

The system should have the following features:

- Tampering detection
- tampering of ignition wire
- attempt to siphon fuel
- attempt to lift vehicle
- attempt to start vehicle without key
- App/mobile warning system
- GPS tracking of vehicle

Idea/Approach Details

Problem Solution:

As vehicle thefts are increasing day by day, to avoid this problem we must follow certain measures.

Some technologies are used to avoid this problem:

Attempt to siphon fuel:

To avoid this problem, we place a PIR sensor (Passive Infrared Sensor) near the fuel pipe. So that when someone tries to detach the pipe then PIR sensor detects the motion of human movement and informs the owner by warning with an alarm.

Attempt to lift vehicle:

For this we place the ultrasonic sensor below the foot mat of the vehicle. Initially when you are on the parking mode in app it measures the distance from obstacle (i.e; between foot mat and ground) by using sound waves. And when the distance starts increasing the alarm warns.

Attempt to start vehicle without key:

Near the start key of vehicle we place the IR sensor in such a way that when the obstacle is placed in start key it breaks that IR sensor rays. So that when the rays break, it notifies the owner by ringing an alarm.

Tampering of ignition wire:

Whenever a person tries to tamper the ignition wire, they need to unpin the ignition connector with the bike connector.

We attach a small plate to one pin and ultrasonic sensor to another pin. Whenever someone tries to unpin the sensor will detect the distance between the pin. When the distance between the pin increases than usual it notifies the owner by ringing an alarm.

Applications/Advantages:

- We use Raspberry pi in this problem because of it's low cost and efficient as it supports linux and python so, that application is easy to build.
- Ultrasonic sensor is used because it has greater accuracy than other methods for measuring the depth of the parallel surface.
- PIR sensor detects motion reliably in indoors as well as in day or dark.
- So, using all these this problem solution give the effective way to protect our vehicle from theft.

Dependencies:

- Raspberry pi
- PIR(Passive Infrared Sensor)
- Ultrasonic Sensor
- IR sensor(Infrared Sensor)

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Idea/Approach Details

Ministry/ Organization name: R. V. R & J. C College Of Engineering

Problem Statement : Reducing the death rate due to the lack of medical resources or failure of professional compassion

Team Name : Flashters

Team Leader Name : PADARTHI BHARGAV

College Code : 1-3514189218

Idea / Approach details

DESCRIPTION

The proposed system provides the flexibility of finding the hospital by sending the details of critical issue to all connected hospitals that are sorted by distance. The information is sent in a form of notification to all the hospitals. The request is analysed and if corresponding treatment for the ailment is found, in turn a return response is made by the hospital whichever accept the case. As the proposed system tracks the solving case records of the hospitals, the people will be able to view the success rate achieved by the hospital specialists in regarding cases that help them in choosing of hospital when couple of hospitals are readily providing the treatment. This process helps the patient and care takers to choose the right hospital that treats their ailment with in time and saves the LIFE OF PATIENT.

TECHNOLOGIES

Front End: HTML, CSS

Back End: PHP, JS

Idea / Approach details

USECASES

- Specifying Case
- Sending Case
- Responding to Case
- Receiving Acknowledgment
- Recommending Hospital

DEPENDENCIES

- Hospital Management Acceptance
- Accurate information of previous cases
- Specialist Availability
- Computer and Internet facilities in remote areas

Smart India Hackathon 2020

Timing Error Estimation and Matched Filtering Using Neural Networks

Problem ID: CK123

Technology Bucket: Smart Communication

Category: Software

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Problem Description:

Timing Error estimation and matched filtering are crucial processing blocks in a communication receiver. The problem is like looking for the occurrence of a known signal in the observed/measured signal, which is noisy and distorted. This nature of problem makes it best suited for intelligent approach, as human brain invariably solves this kind of problem in day-to-day life. Classical techniques like maximum likelihood, Early-Late, Gardner and Muller approaches have been successfully implemented. However, it is perceived that machine learning techniques will outperform the classical approaches and this fact needs to be researched. The neural network shall use minimum computation and converge fast for practical and real-time implementation. If the results are promising, it can be applied for military and commercial radars. Design a proof of concept that can be used to prove that AI can be used to solve above problems and provide significant help to such radars.

Solution:

The input (the signal received by the receiver) to the neural network is a sequential data that varies over time. Hence the idea is to use a **Recurrent Neural Network** to predict the timing error.

Digital Communication:

In Digital Communication Systems, information is first quantized into a sequence of digital symbols, also known as a bit stream. Hence the possible set of digital symbols form a dictionary. These digital symbols are then converted into digital waveforms through modulation.

The waveform is corrupted by various noise sources as it travels to the receiver.

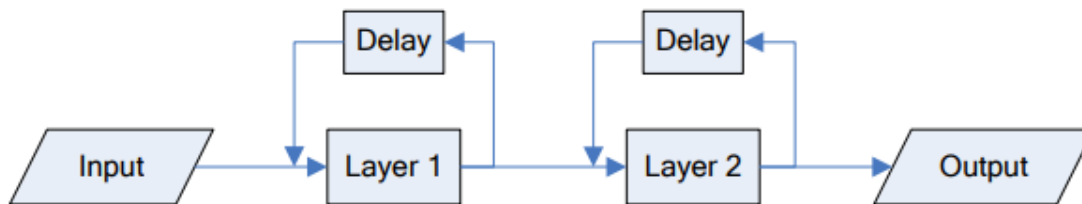
Artificial Neural Network Receiver:

The transmitted signal with noise is then presented to the neural network receiver. The ANN decides what symbol from the set of possible symbols was transmitted. The weights of the ANN are adapted to the characteristics of the incoming signal.

The neural network has

1. One Input Layer
2. Hidden Layers
3. One Output Layer

The incoming signal is digitized and then presented to the input layer of the neural network.



The proposed architecture of the neural network is a bi-directional Recurrent Neural Network with LSTM cells. The NN with attention mechanism might get better results.

Idea/Approach Details

Ministry/ Organization name: DTE of IT & Cyber Security, DRDO

Problem Statement : Timing Error Estimation and Matched Filtering using Neural Networks

Team Name : Tech Wizards

Team Leader Name : Gopaluni Naga Phani Sreevatsava

College Code : 1-3514189218

Idea / Approach details

The transmitted signal with noise is then presented to the neural network receiver. The ANN decides what symbol from the set of possible symbols was transmitted. The weights of the ANN are adapted to the characteristics of the incoming signal. The incoming signal is digitized and then presented to the input layer of the neural network. The proposed architecture of the Neural Network is a bi-directional Recurrent Neural Network with LSTM memory cells. Using attention mechanism might give better results.

The technologies used are

- DPCM (Digital Pulse Code Modulation) Transmitter and Receivers
- Recurrent Neural Networks with LSTM cells.
- Tensor Flow lite.

Idea / Approach details

The main use cases are

- Military Applications
 - Secure Communication
 - Missile Guidance
- Commercial Radars
- Space Communications

Main Dependencies are

- Embedded Linux to run Tensor Flow lite.
- Requires a 32-bit micro processor
- Processor based on Arm Cortex M Series architecture is best suited.

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Ministry/ Organization name: AICTE-MIC

Problem Statement :providing farmers an interface to sell their product and connect with buyers directly. We will provide an interface that will work on mobile by using SMS or toll-free number. By implementing a chat bot

Team Name :RVREC - TECHNOCRATS

Team Leader Name : P. Durga Bhavani

College Code : 1-3514189218

AI BINS

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MAIN MOTTO

To provide clean and safer surroundings , enhance our health , to provide electricity for future generations due to endangering of fossil fuels.

- AI bins Works mainly on Solar Power.
- To begin with , AI bins are Multipurpose bins which can be used for different purposes by each n every individual depending upon their requirement.

BRANCH:

Comes under waste management , Renewable energy , Healthcare device.

CONSTRUCTION:

- Consists of parts which are economical so that initial cost reduces and provide maximum benefits to the public.

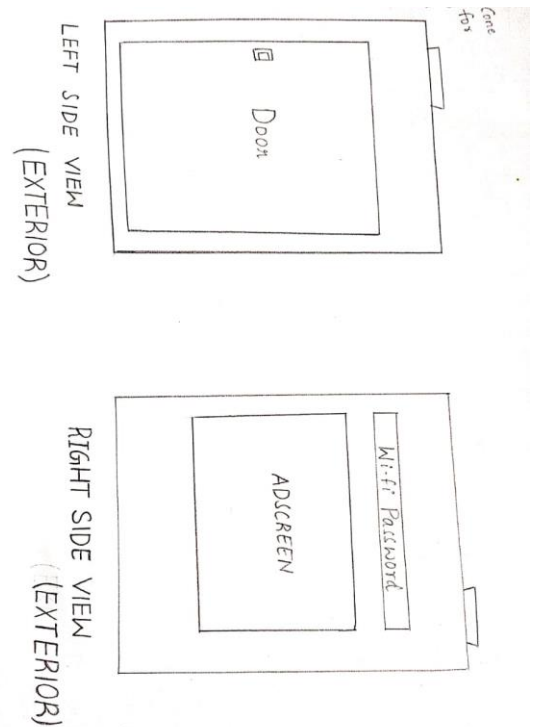
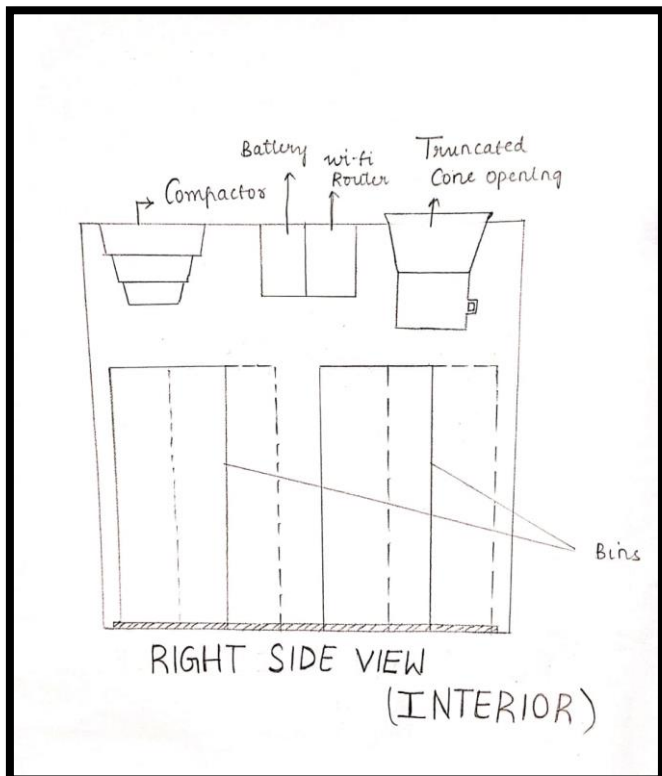
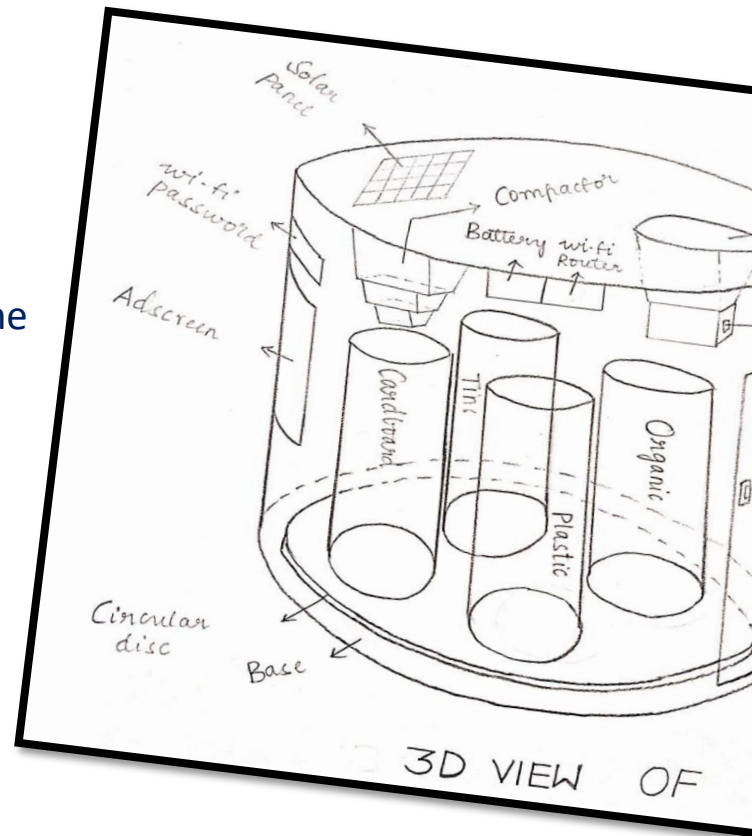
PARTS:

- Mainly the AI bin consists of solar panel , IR sensor with Memory unit , Rasp berry pie , Density sensor at bin level , FOUR circularly designed panels , Rotary disc at bottom , Battery , Compaction Hammer , Adscreens , WIFI Hotspot router , Safety sensors , Fire alarms.

Working Process:

In Order to not to cause any discomfort to the individual , the entire bin is of closed type.

The bin has 2 openings One is to enable the public to dump the waste into it and the other is used for compaction.



- People can dump any type of waste and the IR sensor detects the type of material based on wavelength of materials stored in the memory unit.
- Inside the bin consists of a 4 circularly chambered system placed on a rotary disc . Each chamber classified on the type of material that enters 1st chamber collects PLASTIC,2nd chamber collects ORGANIC MATTER,3rd chamber collects CARDBOARD materials,4th chamber collects TINS , CANS etc.
- The waste that is dumped into the bin is collected into its respective chamber based on its type.
- When any chamber reaches 90prnct of its capacity,Compaction is done with the steel hammer with a force of 720kgf.
- In organic matter when compaction is done, if water oozes out then water is collected in the under drainage system, in order to prevent the corrosion of steel to provide a better life and reduce frequent renewal of it.
- When public dumps the waste , there are no chances of health issues due to which the safety sensor activates .When it detects the hand of the individual dumping waste and it stops the compaction process and expulsion of gases to atmosphere through the air.
- Then the waste is collected in each chamber , if it reaches 95prnct saturation stage then a signal is displayed on the screen that it is almost full and the alarm sounds out and the van which collects the waste and which is nearer to the bin reaches there and collects the waste obtained in different

chambers very easily . Due to this Automatic segregation landfills become less which is a major problem in India.

- The organic matter collected is sent to Vermi compost pits and the plastic can be used to generate petrol or electricity.

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Idea/Approach Details

Ministry/ Organization name :ARAI

Problem Statement Warning System For Driver

Team Name : Unique Coders

Team Leader Name : Piniganti Krishna vamsi

College Code : 1-3514189218

Solution Details

Our main goal is to recognize sign boards which lies on the side of the road , because sign boards convey us a lot of information about a particular area, whether it is a school zone or hospital zone etc .It also specifies certain speed limit of that area.So for that we use a camera which captures the live video when we are travelling. We need to analyse the video and identify the pictures of sign boards. This can be achieved by matching the sign boards pictures with our target data set which are already collected .We need to build a neural network model using some frame works like tensorflow that can classify an image ,In our case it should identify the sign board. The video analysis can be done by using Python open CV also. Once it identifies a particular sign board , we need to check the speed of the vehicle by connecting a speedometer sensor and if the speed exceeds the limit of that particular area , It alerts the driver either through voice or a buzzer.