Computational Thinking Projects using Arduino UNO/Nano

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### Automatic Plant Watering System using Moisture Sensor

#### Problem Statement

Generally, we water the plant in our garden every day or periodically even when the need of a plant is fulfilled.

Automatic Plant Watering System uses Moisture Sensor to water the plant when required. The soil-moisture sensor measures water level in the soil to measure the requirement of water and automatically provides the water to your plants.

#### Next Steps

1. Use this prototype in a garden and observe it's working.
2. Modify the valve structure from where the water is released. Replace the straw structure with robust material.
3. Modify the moment of the Servo Motor and fine tune it.
4. Make a small container box for Moisture Sensor so that the terminals of the sensor are not exposed to Air.
5. Keep the record of Plant vs Interval between two events of watering to it.
6. Create a new prototype and modify the program so that now, A plant in a garden receives the amount of water it needs, and you shall be able to control the flow of a water.

### Smart Tracker – Find the Lost One

#### Problem Statement

If a key is lost inside a home, we find it difficult to find it when we need it, same is the case with our mobile, pair of socks, handkerchief, medicines, that gift from our best friend or something important **right now**. Well, girls decided to solve this problem using technology.

How can we track the location of an object which is lost inside a known environment? Using HC-05 Bluetooth Module and Arduino UNO girls designed a Smart Tracker to identify the location of the object.

#### Next Steps

1. Test the audibility of the buzzer and test the Bluetooth range.
2. Think about form-factor of the device. It should be able to fit with a school bag as well as a keychain.
3. Replace Arduino UNO with Arduino Nano. Optimize the circuit and try and make it as miniaturized as possible.
4. Talk to student mentor and think of redesign of PCB so that you can remove all the extra components from the circuit that are not required.
5. Also, think about the accuracy of the location, Alarm feedback and LED Indication won’t suffice.
6. Brainstorm about how you can use this idea to track a human being in various scenarios.
   1. Pilgrimage Place
   2. Hospitals
   3. Crowded Places etc.

### 

### 2-DOF Robotic Arm

#### Problem Statement

The whole discussion started on a social note, how can we assist physically disabled people. As brainstorming was going on, the team decided to look at the basic human movement that they need to do every now and then. The hand movement. The grip of the human hand is unique and most complex structure if we try to replicate it using technology.

How can we help physically disabled people by designing a simple Robotic Arm with 2 DOF (degree of freedom) to assist them in holding objects which otherwise they cannot?

#### Next Steps

1. Study human grip once again. Look for various motions that we do without even realizing it.
2. Design a grip for your application.
3. Think of Stepper Motor fitting in your project. (Stepper Motor Driver is nothing but the L293D motor driver)
4. Modify the program so that the motion is controlled by force and speed.
5. Discuss with student mentor from Thapar University to create an arm with 3 DOF.
6. Also, you can think of various applications of your arm.
   1. Application in Safety
   2. Defense-related application
   3. Medical Surgery

### 

### Adjustable-Solar Powered Lawn Mower

#### Problem Statement

How can we make the best use of the Solar Energy?

How can we help gardeners with technology by designing a solar-powered adjustable grass cutter?

#### Next Steps

1. Create beautiful outer body for the Lawn Mower.
2. Think of how adjustable blade can be automated, as right now the human effort is there to adjust the height of cutter.
3. Brainstorm with your student mentor about maneuvering the robot in Garden.

### Smart Solar Cell

#### Problem Statement

Sunlight has two components, the "direct beam" that carries about 90% of the solar energy, and the "diffused sunlight" that carries the remainder – the diffused portion is the blue sky on a clear day and is a larger proportion of the total on cloudy days. As most of the energy is in the direct beam, maximizing collection requires the Sun to be visible to the panels for as long as possible.

The energy contributed by the direct beam drops off with the cosine of the angle between the incoming light and the panel. In addition, the reflectance (averaged across all polarizations) is approximately constant for angles of incidence up to around 50°, beyond which reflectance degrades rapidly.

How can we orient a Solar Cell toward the Sun?

#### Next Steps

1. Study the existing solar trackers.
2. Study the mathematics behind the Photovoltaic Solar Cell, Angle of Incidence, Reflectance with your student mentor.
3. Modify your structure so that it can withstand the pressure of the Solar Cell.
4. Modify your program to control the movement of your servo motor.

### UTO AGRI 2.3

#### Problem Statement

***How can we water our plant when they need it automatically?***

#### Description

Generally, we water the plant in our garden every day or periodically even when the need for a water for a plant in fulfilled. Being a residential school, there is a sprawling campus with the trees around.

Automatic Plant Watering System using Moisture Sensor will help us water the plant when the plant needs it. The need of a plant will be measured using moisture sensor and based on feedback from the moisture sensor we will water the plant.

#### Next Steps

1. Use this prototype on the school campus and observe it’s working.
2. Make a small container box for Moisture Sensor so that the terminals of the sensor are not exposed to Air.
3. Keep the record of Plant vs Interval between two events of watering to it.
4. Create a new prototype and modify the program so that now, A plant in a garden receives the exact amount of water it needs.

### Smart Jacket for Deaf and Blind People

#### Problem Statement

***How can we make local commute of Deaf and Blind people more convenient?***

#### Description

Instead of carrying a ‘Stick for Blind’, a wearable jacket is designed which will help a deaf and blind person to commute from one place to another easily and efficiently. The jacket will give a tactile haptic feedback to give a sense of danger or obstacle to the person who is wearing it. And, at the same time, it will give a signal in the form of LED to the environment.

This smart jacket removes the need for carrying a stick around and the system can be well fabricated in clothes also, hence it is wearable. Haptic feedback removes the need for user-specific feedback system as haptic feedback works with everyone.

#### Next Steps

1. Fabricate the circuit on T-Shirt. And try to use it in the real world and see the output.
2. Work with the sensitivity and range of the ultrasound sensor.
3. Also, think of how you will guide the deaf/blind person to walk around.
4. Add one more ultrasound sensor at the back so that Smart Jacket can raise alarm even if an object comes near to person wearing a jacket.

### KIDEE WASH – A Low-Cost Washing Machine for Kids

#### Problem Statement –

***How can we help cost effective washing machine for school hostel?***

#### Description –

As soon as Design Thinking was introduced, students came up with their own daily problem that they faced; Washing of their clothes. They wanted to make something which will help them to wash at least handkerchief, ribbons, socks etc. Girls came up with an idea of the low-cost washing machine. When designed properly and scaled up to accommodate shirts and skirts this becomes a ‘Top-Load Washing Machine’. Right now, it is only ***Top Load Half Litre Washing Machine***.

#### Next Steps

1. Test extensively with different types of clothes and find out the time taken by washing machine to clean them.
2. Make a mechanical design for Rinse and Fill operation.
3. Attach a display (LCD) with three options, TIME, START, STOP
4. Well, make few washing machines and give it to your friends so that they can wash their clothes easily.

### Electro-THOR

#### Problem Statement

***How can we automate the street lights in school campus to ON/OFF as per the availability of sunlight?***

#### Description

Generally, street lights in campus are ON even at 7:00 am when the campus is well lit with sunlight but are turned OFF even at 7:30 pm in the evening when students really need it. So, this time students came up with an idea to design a system where using LDR, an automatic Street Light ON/OFF system which will turn ON Street Light as soon as Sun sets and will turn OFF as soon as Sun rises.

#### Next Steps

1. Make a working model which will work for the dormitory.
2. Implement the model to turn ON/OFF campus street lights.
3. Calculate how much energy saving can be done in a day/month/year using this model.

### WOMEN POWER BAND 2.0

#### Problem Statement

***How can we help build this country a safer place for women?***

#### Description

Being a residential girls school, the safety of everyone is a concern. Girls of this group came up with an idea of making a wearable bracelet using Pulse Rate Monitor and LM35 Temperature sensor. This device will measure the pulse rate and body temperature continuously. If the pulse rate is beyond the threshold and/or body temperature is exceeding the threshold limit, it will start indicating the danger alarm, and will alert the school authorities and nearby police station.

#### Next Steps

1. Make a proper bracelet. Add Pulse Rate Monitor and LM35 Sensor to it.
2. Attach a Bluetooth HC-05 to the Arduino Board; Make one Application, which will receive a message from this device.
3. Maybe use ESP8266 and work over wi-fi.
4. Think of how you can minimize the size of the device.
5. Work with your mentor and make a new PCB design where you can fit everything in the small package.
6. Use it in real life. And analyze the results, modify your device.

### DUST 20-18 A Smart Dust Bin

#### Problem Statement

***How can we help ourselves keep this campus clean and litter free?***

#### Description

Students not only recited the 5 resolutions put up by the school on the wall but have inculcated the habit to follow them. One of them is, ‘***KEEP OUR CAMPUS LITTER FREE***’. To follow this resolution students designed the smart dustbin using Ultrasound Sensor and PIR Motion Sensor along with Servo Motor, to detect if someone is in the periphery; and if someone is in the periphery to alert them with a sound alarm, visual direction to reach dustbin and open the lid of the dustbin when the person is next to dustbin.

#### Next Steps

1. Add three more Ultrasound Sensors to detect if someone is coming from the Left-Right-Back-Front side of the dustbin.
2. Change the way dustbin lid opens. Design more efficient way of the opening lid.
3. Think of how you can separate dry waste and wet waste.
4. Indicate the sign if the dust bin is full/empty so that cleaning staff can come and dispose of the waste.

### SURAKSHA BAND

#### Problem Statement

***How can we help our soldiers?***

#### Description

Our soldiers work in extreme weather conditions. To assist the soldiers during their service this SURAKSHA Band is designed. This wearable band can be used to detect the hidden objects in the war zone and also to measure health parameters of soldiers.

Using ultrasonic sensor, along with object detection the distance between the person wearing this band and the object is also displayed on the OLED display and a haptic feedback is given using vibrator motors.

#### Next Steps

1. Redesign the band and use it on the School campus.
2. Think of how to detect if the object is safe or dangerous to handle.
3. Design Mobile Application for remote communication.
4. Visit nearest police station and try to have at least 1 trial run of the prototype.

### LightUP

#### Problem Statement

***How can we help maintain School washroom clean and hygienic?***

#### Description

With 1100 students in a school, maintaining a washroom is a challenge itself. And a well-lit and well-maintained washroom makes it more comfortable to use. The team came up with an affordable easy to implement a solution to light up the washroom only when someone uses it.

A PIR motion sensor will be installed in each of the washrooms to detect human presence based on which lights will be turned ON/OFF.

#### Next Steps

1. Install the LightUP system in the school washroom.
2. Observe use cases of the system and note them down.
3. Make changes accordingly and with the help of guide make a relay-based system to provide sufficient lighting inside the washrooms.
4. Measure humidity and Ammonia content in the washroom and accordingly create the automated flush system.
5. Think about ‘*how a solar panel can be used in the system?’*

### 

### DRY-WELL: Automatic Cloth Drying Roof Hanger

#### Problem Statement –

***How can we keep clothes dry during rainfall?***

#### Description –

As soon as Design Thinking was introduced, students came up with their own daily problems that they faced; looking after clothes in the rainy season when they are hanged on the roof for drying. A simple pully-based system which detects rainfall and automatically retracts the cloths inside the shelter is designed using FC-37 rainfall sensor and DC Motor.

#### Next Steps

1. Test extensively with different types of clothes for speed and weight.
2. Simulate rainfall conditions such as heavy rainfall, medium rainfall, normal condition.
3. Measure humidity and temperature and try if you can create heater system.

### TrackHealth

#### Problem Statement

***How can we measure critical health parameters and provide help to parents living in remote areas?***

#### Description

Parents who live away from their children or old age people who live away from their relatives in remote areas are prone to health risks. TrackHealth will measure critical health parameters such as Pulse Rate, Body Temperature, Humidity, Blood Pressure etc. and store it locally and update the relatives every day. And alert the health services/family physician in case of emergency or in case of sudden changes in the health parameters.

#### Next Steps

1. Make a working model which will work for all age groups.
2. Design a mobile application for the remote communication.
3. Design a system to measure the pulse rate more accurately.
4. Think of a more simpler design for a box.
5. Design a system to measure Blood Pressure.

### SMART WASTE MANAGEMENT SYSTEM FOR MID-DAY MEAL

#### Problem Statement

***How can we reuse-recycle-reduce leftover food in school during mid-day meal?***

#### Description

With more than 1000 students studying in the school, even on a zero-waste day, a leftover food will weigh up to 20kg. This amount of leftover food is huge and can be utilized to create fertilizers. A 3-stage waste management system which grinds the waste and squeezes it using pressure mechanism helps to get dry waste which will be further used as fertilizer and liquid content to be accumulated at the other end.

This can become a smart way of managing leftover food and waste food in the school in a most efficient way.

#### Next Steps

1. Use it in real life. And analyze the results, modify your device.
2. Measure the timeline of from dry waste to compost.
3. Work on automation of the system to the level of mixing soil in the dry waste.

### 4Litre-Everyday

#### Problem Statement

***How can we help ourselves keep hydrated and drink enough water?***

#### Description

One must drink a minimum of 4L water every day. But, sometimes we do not drink sufficient water at regular intervals. This might lead to dehydration, tiredness, other health issues as water is an important constituent of our digestive system.

4Litre-Everyday is a Smart Plate which reminds a person using it to drink water at regular intervals. It uses haptic feedback, led to visual indication and buzzer to give sound alarm every 20 minutes.

#### Next Steps

1. From Smart Plate, design a smart bottle which will indicate the amount of water to drink.
2. Suggest how much water one should drink based on environmental conditions and other health parameters.
3. Check drinking pattern and based on it adjust the time interval for the alarm to drink water.

### AUTOMATIC COTTON FIELD PROTECTION SYSTEM

#### Problem Statement

***How can we help save cotton crop in extreme weather conditions?***

#### Description

Sircilla is known as a textile town. A cotton industry is a major economic factor here in Sircilla. Students through design thinking came up with an idea of supporting farmers to save their cotton crop.

Using Rainfall Sensor FC-37, a mechanism is designed such that if rainfall starts then automatically a cover will be operated to cover the entire cotton crop storage area.

This would help farmers to save their cotton crop getting wet in rain.

#### Next Steps

1. Visit the nearest cotton farm and ask the farmers about how they keep crop safe from rainfall.
2. Make a crop cover more robust and strong.
3. Think of other applications of this project in real life.

### PLAYMORE

#### Problem Statement

***How can we help students follow the timetable?***

#### Description

Generally, students do not follow timetable at home. They tend to follow a pattern, EAT-PLAY-EAT-SLEEP. And because of this, they do not find time to complete their homework on time. But, what if they have given the power to follow the timetable and complete their homework and find more time to play.

Students have come up with this interesting solution for the following timetable using DS1307 Real Time Clock Module and LEDs. The PlayMore starts at 4 PM every day and gives the alarm as per the pre-defined schedule.

#### Next Steps

1. It is a clock and it needs to have clock hands to show exact timing.
2. What if schedule changes or someone wants to follow the different schedule. We need to provide this functionality also.
3. Use this in your home and check how much time you can save and play more.

### BREATHALYZER 2K18

#### Problem Statement

***How can we make travel safe?***

#### Description

Drunk and Drive is one of the major cause of road accident. A driver who has not consumed alcohol will drive consciously and passengers will reach safely to their destinations.

Assuming this fact, students of ZPHS Sircilla designed a breath analyzer to detect whether the driver is drunk or not using GAS Sensors. GAS sensors used in this system are MQ-3 and MQ-135. If the driver has consumed alcohol than prescribed limit then the system will alert the passengers, and thus they can demand a new driver.

#### Next Steps

1. If the driver is drunk vehicle should not turn ON, is the major feature you need to add to your device.
2. Think of various ways you can detect whether the driver is drunk or not.
3. Test this in real time and update the algorithm to detect the consumption level of alcohol.

### RELAXING GRIPPER PEN

#### Problem Statement

***How can we help students to feel relaxed while in a classroom?***

#### Description

Tanisha is a grade 6 student who cannot write continuously for 10 minutes, she

needs to break after every 10 minutes of writing task. Doctors said that her motor skills are not developed. Students wanted to help students like Tanisha to reduce the strain on their writing grip.

Students used Arduino NANO and Vibrator Motor and fixed it on Pencil so that whenever a child wants to write, every 10 minutes the pen will vibrate for 10 seconds, giving vibratory massage to the grip thus reducing the strain on the grip.

#### Next Steps

1. Try and understand how much strain is induced at grip section while writing.
2. Try to make a complete casing of the model and use it with various students and study their reaction, time is taken to reduce strain on the grip.

### SMART RAILWAY CROSSING

#### Problem Statement

***How can we help to make railway level crossing safely?***

#### Description

In India, railway level crossing is a major reason for accidents and deaths among all types of railway accidents. Telangana has witnessed tragedy in 2014 when 25 children lost their lives at railway level crossing.

Students wanted to solve the problem of Railway Level Crossing and they designed a safety system which will help reduce the accidents at railway level crossings if implemented. This system uses Hall Effect Sensor to detect the entry of railway and exit of the railway at a level crossing. Using multiple hall-effect sensors we can easily detect the railway approaching the level crossing and exiting it. This will definitely reduce the accidents.

#### Next Steps

1. Read the Hall-Effect Sensor manual to understand its usage in detail and understand where this system will fail.
2. Think of adding another sensor to this system as a fail-safe mechanism.
3. Think of mobile application which will intimate the railway approaching the level crossing to vehicle drivers, school buses, truck drivers etc.

### MINI RADAR

#### Problem Statement

***How can we help our soldiers to be prepared for an emergency?***

#### Description

Our soldiers work in extreme weather conditions. To assist the soldiers during their service this radar is designed. This wearable band can be used to detect the hidden objects in the war zone.

Using ultrasonic sensor, along with object detection algorithm, the distance between person mini radar and the object is also displayed on the remote computer screen.

#### Next Steps

1. Mount the radar on a cap or wristband.
2. Think of how to detect if the object is safe or dangerous to handle.
3. Display the OUTPUT on OLED display. Use Processing.org for the same.

### AUTOMATIC CATTLE-FARM CLEANING SYSTEM

#### Problem Statement

***How can we help farmers maintain the cow shed clean?***

#### Description

About 50% of the workforce in India is engaged in agriculture and allied sectors. Cattle farming is one of the major activity among Indian farmers. Keeping these cow sheds clean and germ-free/bacteria free is a difficult task to perform.

Students devised a GAS Sensor based automatic cow-shed cleaning system which will clean the cow-shed periodically when there is a need. whenever the animal eructates (burps) or defecates, it emits a significant quantity of methane at the same time. And the MQ-4 gas sensor is used to detect methane levels in cow-shed. If the level is beyond the accepted limit, the cleaning system starts and cleans the entire cow-shed.

#### Next Steps

1. Cow-shed is a place where one can collect cow-dung. Current automatic cleaning system does not consider that significant amount of cow-dung can be collected.
2. Talk to farmers and try to understand their problems in cleaning the cow-shed. Try to add some functionality to this model so that those problems can be solved.

### PAHADI – THE SMART HILL TORCH

#### Problem Statement

***How can we help people who live on hill-top?***

#### Description

There are certain areas in Guwahati, where people stay in the hill-top area and do not have access to electricity. It becomes difficult during night time to come down to the city area and walk back to the hill-top without the help of street light.

Students decided to solve this problem and designed a smart torch which will turn on in the evening and will give enough light so that person carrying this torch can carry out his daily chores easily. This torch is LDR based and is low cost.

#### Next Steps

1. Redesign the torch so that people can turn it on and turn it off.
2. Also, add a battery and solar cell to make it rechargeable.
3. Use multiple faces to give the different intensity of light such as Torch for Study, Torch for Kitchen, Torch for Outdoor activities.

### SMART MEDICINE DISPENSER

#### Problem Statement

***How can we provide first aid in school?***

#### Description

Traffic condition in most of the cities is worsening day by day. In this scenario, it becomes very difficult to provide medical help on time to the person in need. Especially in a school where a child might need the medical help may suffer due to the bad traffic situation.

To tackle this situation and to provide access to basic medicines this medical dispenser using push button, servo motor, and Arduino UNO. Once a push button is pressed then associated tablet will be dispensed at the bowl in the machine, the student can take the pill and consume it.

This machine will be placed in Principal Office to avoid misuse of it.

#### Next Steps

1. As this is a medicine dispenser, this machine should check body temperature of a patient and then should suggest the medicine for them.
2. Well when you take medicines, you need lukewarm water.

### STERILIZING CLASSROOM

#### Problem Statement

***How can we help maintain the disinfecting classroom?***

#### Description

When teachers started discussing their problems with students during Design Thinking session, one of the problems was who will invigilate the class where only students infected with chicken-pox or such contact/non-contact diseases are present during examination time.

Students came up with an idea of sterilizing classroom. They created an enclosed room where the sterilizing mechanism is turned on when a student enters the room. Student entry and exit are detected by Ultrasonic Sensor. When a student with infection enters the room, UV lights are turned ON. When everyone leaves the room, the UV lights are turned OFF.

#### Next Steps

1. Study the various ways you can keep the classroom disinfected.
2. Implement this model in the classroom.
3. Study the side effects of UV light and try to replace UV light with some other natural solution.
4. Work on the entry and exit count of people, and based on the count control the disinfecting mechanism.

### SMART TRAFFIC LIGHTING SYSTEM

#### Problem Statement

***How can we help create traffic awareness and follow traffic signals?***

#### Description

A simple yet elegant solution to one of the most pressing problems in the country. People usually jump the traffic signals, do not follow lanes and vehicles are not turned OFF at a traffic signal. This leads to excess usage of petrol; honking by bike riders and car drivers; accidents. We tend not to follow traffic rules.

In this solution, a traffic light is kept at height, which will be visible from long distance also. This will help us to build the good awareness about the traffic signal.

#### Next Steps

1. Empathize with Traffic Problems and find out where this solution helps.
2. If a traffic signal the vehicle is not turned off, then display a message and think of ways in which you can turn off the engine automatically.

### Project Ghadiyal(ઘડિયાળ)

#### Problem Statement

***How might we help people to keep track of time, local temperature and humidity using technology?***

#### Description

When Design Thinking was introduced to the students, some of them knew what they *need* to work on. Students wanted to design a digital clock which will show them ‘***what time is it?****’ and ‘****what day is it?****’.* With the continuous discussions with training team, students were able to articulate the use cases of the clock. As various sensors were introduced to them, a digital clock was designed which would display, ‘***Date, Time, Temperature, and Humidity****’.*

Students formed their group and designed a cardboard case for the clock. In order to display the current time, date, day, temperature and humidity students decided to use 20 x 4 LCD (similar to that of 16 x 2 LCD).

#### Next Steps

1. Currently, the messages are displayed in English. Using the libraries available students can display the messages in regional language, in this case in Gujarati.
2. Replace the cardboard case with a wooden case or visit the welding workshop in the community and fabricate a clock case using metal and, in the process, learn the art of welding.
3. Provide alarm setting on the clock.
4. Students can design World Clock to display Date and Time of international cities.

### Smart Grass Cutter

#### Problem Statement

***How might we help farmers by automating various farming tasks?***

#### Description

The school is in a remote area and is surrounded by cabbage/wheat/potato/tobacco farms. Students belong to the community where their parents either own the farm or work on these farms. Every day these students would visit the farm and help their parents.

As Design Thinking and technology discussion was going on a group of students decided to automate one of the routine and laborious task, i.e. grass cutting. Grass grows between the

#### Next Steps

1. Use this grade cutter in fans. Understand the use of it. Note down the drawbacks of current grass cutter.
2. Also, add a rechargeable battery and solar cell to make it cost effective.
3. Try and add multiple blades.

### Automatic School Bell

#### Problem Statement

***How might we help to make the best use of school bell?***

#### Description

During the workshop when asked to observe the problems in their surroundings, students identified that sometimes mischievous students try to ring the bell, and this disturbs everyone in the school.

Group of students designed a school bell which rings at the pre-defined timetable. It is very simple, and its use can be found not only in school but at places like offices etc.

#### Next Steps

1. Use this automatic bell in school.
2. Add a feature to feed in the timetable and duration of the bell.

### Moving Dustbin

#### Problem Statement

***How might we help maintain cleanliness?***

#### Description

Plastic bottles, scrap papers, chocolate wrappers were found in and around the school. Students observed that people are not throwing waste in the Dustbin.

These students decided to help people throw waste in Dustbin by moving the Dustbin itself to the person who wants to throw.

Using robot chassis and wheel thy designed the moving Dustbin. The Dustbin moves in the forward direction only and people can throw waste in the Dustbin mounted on top of chassis.

#### Next Steps

1. Currently, Dustbin is moving in an only forward direction. How can the Dustbin navigate in a classroom environment?
2. The Dustbin lid opening-closing mechanism can be automatized.
3. Think of creative ways to use this phenomenal dustbin so that people will throw waste in dustbin only.

### ADHAR 1.0

#### Problem Statement

***How might we help blind people walk on the road safely?***

#### Description

When all the sensors were introduced Meghana and her team decided to help blind people using Ultrasonic Sensor. When they tried to understand the problems, blind people face while interacting with surroundings, they were able to articulate the way this interaction happens.

After applying Design Thinking tool to their problem statement, the team decided to design a Stick for blind people which will have Ultrasonic Sensor to detect obstacles, Moisture Sensor to detect the presence of water or mud, a buzzer to give the alarm of danger and a vibratory motor to give haptic feedback to the blind person.

#### Next Steps

1. Empathize with the problems blind people face during their interaction by making them use this stick.
2. Find out what works and what does not work.
3. Prepare a proper Stick for Blind people and use it in the real field.

### Safety Alarm System

#### Problem Statement

***How might we help detect rotten potatoes and save lives?***

#### Description

When all the sensors were introduced, Bhupendra and his team came forward and shared one of the accident. A blast in a storage room which was used to store potatoes was in the news sometime back in Gujarat.

These boys wanted to create an alarm system which will detect the level of a gas emitted from rotten potatoes and will give an alarm.

When they researched about the same, they found out the gas that is emitted from rotten potatoes in dangerous and is known as **Glycoalkaloids**. Research confirms that Glycoalkaloids released from rotten potatoes if in a confined storage can be very deadly.

#### Next Steps

1. Visit the nearest cold storage and figure out how the storage owner maintains the safety of workers. Also, look at the method of removing rotten potatoes.
2. If it is possible then understand the other ways you can identify the rotten potatoes in the storage and can give an alarm.
3. Visit nearest research lab/engineering college/science college and interact with teachers and students and understand how you can make your own sensor to detect the Glycoalkaloids.