



SPITOMETER - Spit Sensing Device for Public Places

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The project is aimed at installing sensors in public places so that any action of spitting can be detected and the defaulter can be fined/ punished. Gradually this system can abate the act of spitting in public places and ensuring a hygienic environment. For a test area, an interior of bank building has been taken into consideration for primary iteration of the prototype. It comprises of opaque PCB connected to a circuit with buzzer with a combination of separate camera surveillance system. Ideally, the sensor needs to be printed on transparent plastic sheets. Instead of the buzzer camera or an interactive display may also be installed. However in this project, output has been limited to a buzzer being activated when spit falls on the sensor

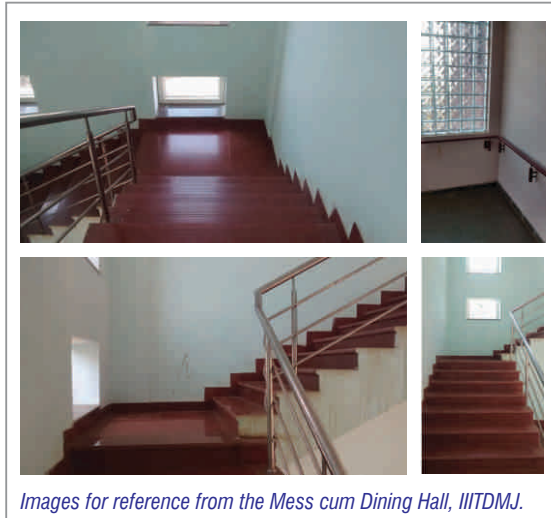
Introduction

Spitting is a very common practice in India and several other places. Markets, bus stops, railway stations, archaeological sites are all made very unhygienic. Spitting makes the environment dirty, spreads communicable diseases and degrades the importance of the monument, complex or area. Despite of all advancement in technology and economy, India lags behind hugely in sanitation and hygiene. While Singapore, USA and UK have stringent laws, India is still negligent and yet to find a solution to curb this menace.

Test Scenario

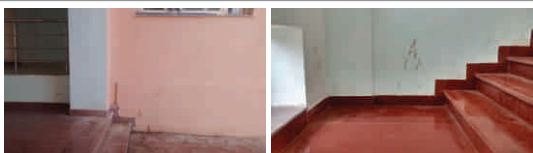
Application of 'Spitometer' would be for public buildings, Railway stations, Bus Stops and

Archaeological sites, particularly. Since Railway Station, Bus Stops and Archaeological sites are open spaces, test application would be difficult in the very first iteration as there are too many parameters to be considered for open environment. This includes – how to spot, catch and penalize the defaulter; as in open spaces there are chances that the defaulter may not be tracked or the security may not be present to penalize. For the first iteration, Interior of a public building is being chosen. Spots such as corners of halls and stairways are most commonly used for spitting in



Images for reference from the Mess cum Dining Hall, IIITDMJ.

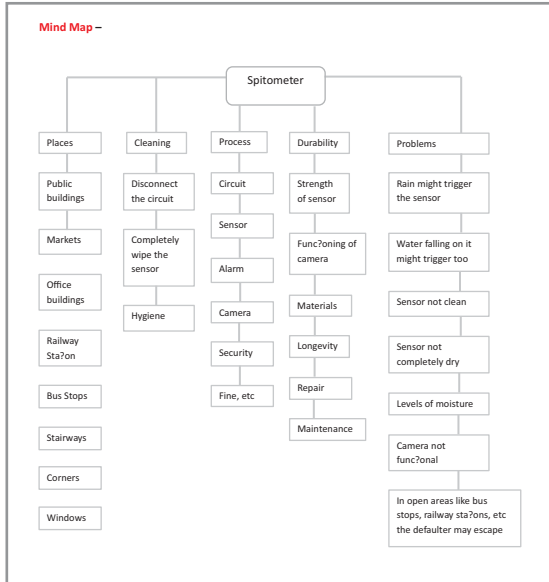
bank buildings and other offices. It is easier to capture the person on camera, an alarm or light or some other form of indication is used for notification, the defaulter may be identified by the already employed security person and penalized. One metre vertical height along the corridor can be sufficiently covered with circuits that may trigger an alarm that notifies the action. Circuits may be present in the form of specific tile size linked to each other forming a mesh throughout the surface. A camera may be present (in appropriate locations) to



Spit marks on the walls of the recently inaugurated Mess cum Dining Hall, IIITDMJ

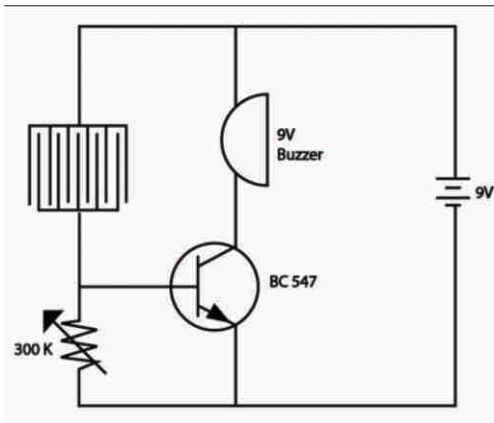
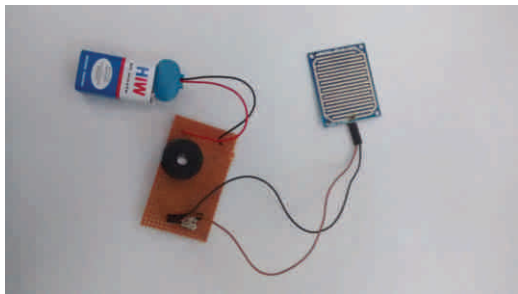
CONSTRUCTION

detect motion below and nearby.
Mind Map

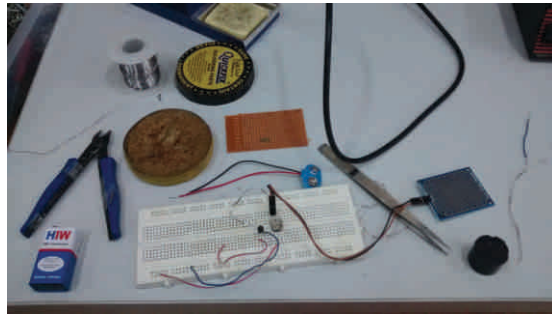


Test circuit on Bread board and Rain Sensor
Circuit Diagram

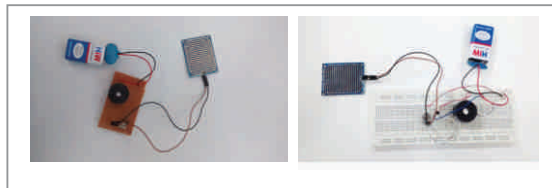
Soldering of components on FRP4 sheet



Final test circuit on perforated FR4 sheet

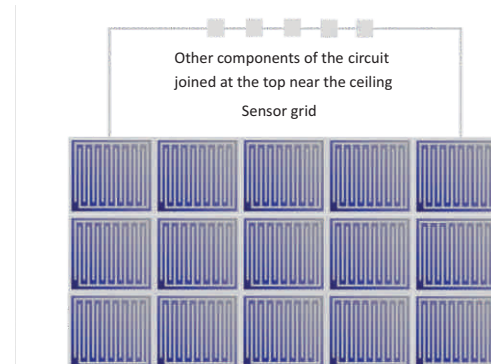
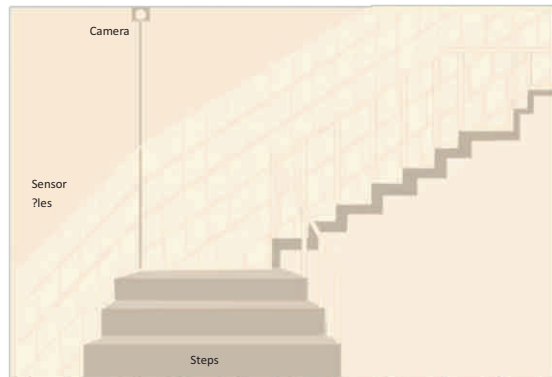


soldered
Circuit Components

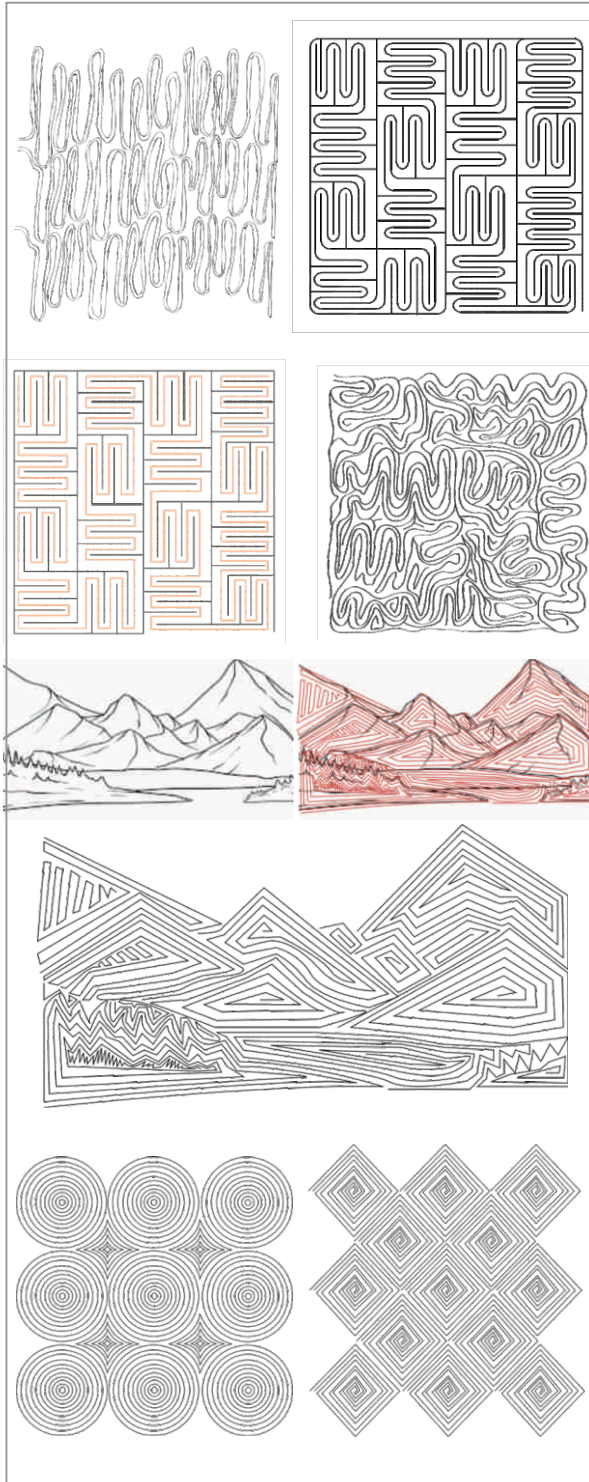


Buzzer 9V, Battery supply 9V, Resistance 300K,
Transistor BC547, LDR, Rain Sensor, FR4 And
Multimeter, Wires and Soldering components

Illustration created on Adobe Illustrator –
Sensor in actual scenario (Closed building)

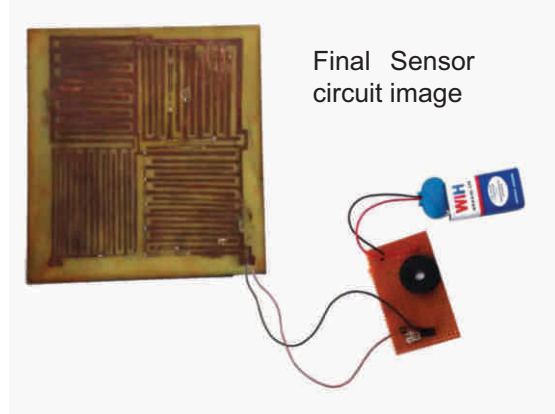


Pattern EXPLORATION for sensor grid
(Adobe Illustrator)



Analog surveillance systems

Most security cameras on the market today are standard analog security cameras connected



directly to a digital video recorder. The cameras in this type of system consist of a lens, DSP chip (digital signal processing chip) and housing. These cameras are simply the window used by the DVR (digital video recorder) to see. The cameras are connected to the DVR using transmission cables. There are many types of cables, but they will all have a connection directly to the DVR. The DVR is the heart of this system. The security digital video recorder receives the video from the camera, compresses and stores it on a hard drive to be retrieved later. Most DVRs also convert the analog video to digital format and are able to stream that video over the internet using a built-in web server. In this scenario, the DVR is responsible for compression, conversion, storage and streaming of all the video that comes from each camera.

Conclusion

The spit sensing device enables constant monitoring of activities of people and aims at abating the unhygienic habit of spitting. The camera continuously monitors the activities of people and the sensor detects the act of spitting. As people gradually get used to the fact that sensors have been installed it is assumed that people will not spit in public places and find appropriate place for spitting.

Scope for future work

Instead of the buzzer, a camera flash can be activated that captures the image of the defaulter. Display monitors can be activated saying "Do not Spit Here!" There can be more creative ways that can be explored. Instead of an opaque PCB, transparent PCB printing does not spoil the aesthetic of the building.

