# Smart Alert

Innovative Device for Human Safety and Disaster Management

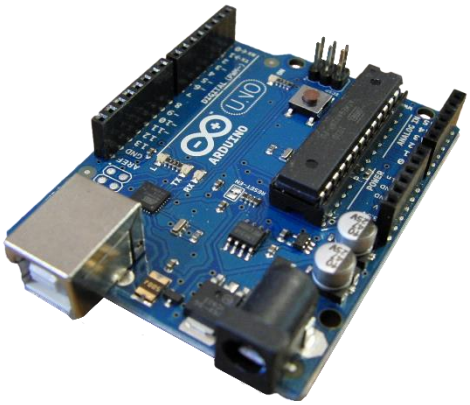
# Introduction

*Smart Alert is a device which evaluates the situation of natural disasters (in this case flood) in a region and provides a better chance to people and authorities to control and minimize the damage in the Region. Smart Alert is a very small and inexpensive device which can be mounted at various locations in the Region. This Network of Smart Alert modules which are spread over the Region sends the data collected by them to a central server which then can form a more concise report.*

*This report can be easily accessed by authorities in order to provide support and tackle the disaster and not only that but this can also be broadcasted through an app to the public. This App shows the real time report of all the location around the region and tells which places are still relatively safe and which are dangerous.*

*Often during times of heavy rainfall, drainage systems in residential areas are not adequate, or unchecked civil development severely impedes the functionality of an otherwise acceptable drainage system. Floods cause extremely large numbers of fatalities in every country, but due to India's extremely high population density and often under-enforced development standards, a large amount of damages and many deaths which could be otherwise avoided, are allowed to happen. This device tackles flooding situation quite effectively….*

# Working



*The Smart Alert has an Arduino onboard which handles all the processing like calculation of water level and Transmitting the data back to the server.*

*Arduino is connected to an Ultrasonic Sensor which sends a Ultrasonic wave which on reflecting from the water surface is detected by the receiver and the time taken by the wave in coming back in taken into account and using a simple formula this device exact water level at its position. This data is then sent to the main server which can then relay the data back to the app along with useful information like a guide on how to avoid the flood-prone areas and also which areas is relatively safe.*

*The data is sent using a GSM module and it also helps in uniquely identifying smart alert device based on the unique sim card in the gsm module. This can then be mapped to a certain location in map. GSM module also can be used to log the problems and get daily diagnostic maintenance report of the smart alert devices. Smart Alert is also configured to receive commands from the gsm module which can be easily programmed on the Arduino itself like calibrating the sensor to ensure better and exact reading from the device.*

*The Smart Alert is powered by a small battery which is charged by a solar panel on the top which allows the smart alert to work without requiring much maintenance.*

*The App integrated with smart alert can not only display the Realtime status of the streets but also it has multiple functions of its own like “I Am safe" option marks the location of the user as safe but it does not act on that factor alone, It also checks other people’s input and condition of the respective region from smart alert in order to prevent misuse or to present wrong information to its users. Also It has another feature called “help me” which can track the location of the user and send this data to the server so the that authorities can track the location of the person and help him/her.*

# Advantages

*Smart Alert needs very few components needed to work and this allows us to enclose everything in a small container which can then be easily deployed. It can be mounted on a traffic signal, wall, electric poles, etc. Also, it can be mounted at any height and calibrated to work as the ultrasonic sensor has a very high precision.*

*The Smart Alert is a very inexpensive way to tackle a very prominent problem in India. All the components needed to make the smart alert are cheap and easily available and does not require much effort in assembling. This can allow the Smart alert to be deployed on a large scale without a big investment.*

# Future Scope

- *The Smart Alert can be easily Reprogrammed over the network without having to reprogram every module manually.*
- *The smart alert can also be used for other disasters by modifying and adding a few more sensors.*
- *Data from smart alert can also be processed by an algorithm on the server to predict water level in different area*
- *Smart alert data also allows identifying the area where the water is not being drained properly thus allowing the authorities to fix and prevent it in future.*
- *App can also be modified to make this device more suitable for other disaster as well.*