

Case study:

Noise Detection Using automatic recording system



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Agenda

- Abstract
- Introduction
- Components
- Working
- Advantages/Disadvantages
- Conclusion

Abstract:

Noise detector with automatic recording system is used to detect the noise and record the noise automatically. Expansion of sound in schools and office have demonstrated to be a significant issue. A teacher can't screen every single one non stop. To tackle this, issue a Commotion identification with an programmed recording framework utilizing Arduino is planned . This gadget informs us at whatever point it recognizes boisterous discussion (the sound level above 120dB to 140dB) and it additionally records the discussion and recoveries in a record.

These gadgets are utilized in quiet zones like medical clinics, libraries, labs, and furthermore in schools and universities to look after dignity. This causes us to keep up quietness and furthermore to recognize uproarious individuals so that fundamental activity can be against them.

INTRODUCTION :

The universe of the web of things is boundless and accompanies a ton of genuine applications. It's been a couple of years since the word IoT got comfortable to the universe of innovation. From that point forward there have been numerous inventive thoughts upheld with the force of this gadgets all over. Today we will sea bout a Commotion discovery framework that utilizes IoT. Noise can a major issue for a significant number of us in an assortment of situations. From being one of the less known and considered climate poisons be to a major interruption during office hour's commotion is a secret malevolence. We as a whole have gone over somebody who talks boisterously which prevents us from focusing on the thing we were doing. From workplaces to libraries and homeroom commotion has consistently been an issue. So with IoT, we will discover an answer for this commotion issue. A commotion locator with the capacity to record sound is the possibility of the day. Thusly, we can discover who made the commotion and rebuff them or let them hear their high pitch noise so they understand what they were fouling up the entire time.

COMPONENTS:

Arduino Nano: The Arduino Nano is a little, complete, and breadboard- accommodating board dependent on the ATmega328 . It has pretty much a similar usefulness of the Arduino Due mil a nove, yet in an alternate bundle. It needs just a DC power jack, and Smaller than usual B USB link rather than a standard one. works with Fig: Arduino Nano

Specifications of Arduino Nano are:

Microcontroller used is Microchip ATmega328P.

- * Input voltage is 6 to 20 Volts.
- * Operating voltage is of 5 Volts.
- * Flash Memory is of size 16 KB or 32 KB.
- * EEPROM is of size 1 KB.
- * DC Current per I/O Pin is 40 mA.

BUZZER:



A ringer or beeper is a sound flagging device,[1] which might be mechanical, electromechanical, or piezoelectric (piezo for short). Regular employments of bells and beepers incorporate alert gadgets, clocks, and affirmation of client information, for example, a mouse snap or keystroke

BLUETOOTH HC-05:



To arrangement Remote Sequential Correspondence, HC-05 Bluetooth Module is generally requesting and well known because of its low cost and very high highlights.

This module can be utilized in Expert or Slave Mode and simple switchable between these two modes, Of course Slave mode is arranged.

Modes can be changed utilizing AT Orders. The slave mode in HC-05 can't start an association with another Bluetooth gadget, however can acknowledge connections. Master mode can start an association with different gadgets.

HC-05 Applications:-

- *Inserted Ventures .
- *Mechanical Applications .
- *PC and versatile Gadgets .

SOUND SENSOR MODULE:



Sound recognition sensor module identifies the force of sound where sound is recognized by means of an amplifier and took care of into a LM393 operation amp. It includes an installed potentiometer to change the setpoint for sound level.

Sound Recognition Sensor Module Pin Setup

Pin Name :Portrayal VCC :The Vcc pin controls the module, normally with +5V GND:

Force Supply Ground

DO :Advanced Yield Pin. Straightforwardly associated with advanced pin of Microcontroller AO:

Simple Yield Pin. Straightforwardly associated with a simple pin of Microcontroller Sound

Recognition Sensor Module Highlights and Details

*Working Voltage: 3.3V to 5V DC LM393 comparator with limit preset

*.0..PCB Size: 3.4cm * 1.6cm

*Acceptance distance: 0.5 Meter

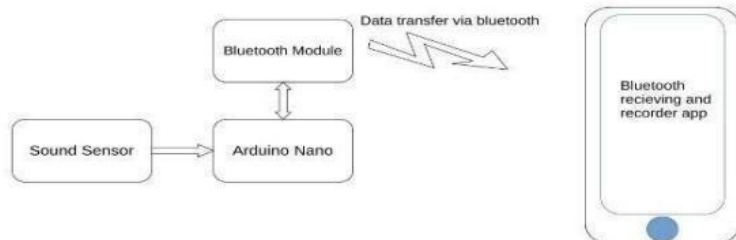
*Working current: 4~5 Mama

*Receiver Affectability (1kHz): 52 to 48 dB

*Simple to use with Microcontrollers or even with typical Advanced/Simple IC

*Little, modest and effectively accessible

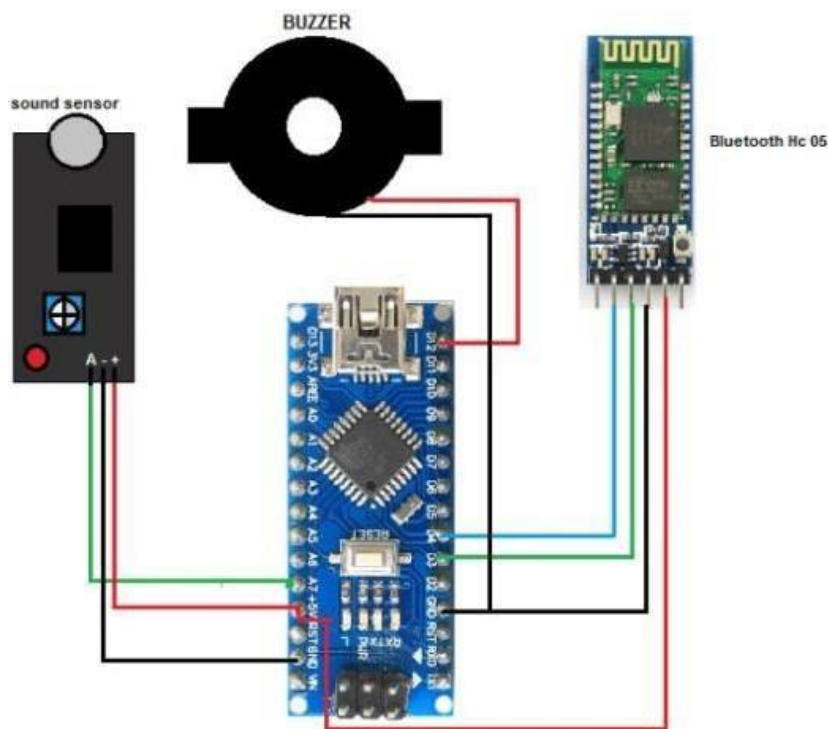
BLOCK DIAGRAM:



Connection:

Now connect all the components as illustrated below

Arduino Nano	Components
Pin A7	Sound Sensor Out
5v	VCC Bluetooth & Sound sensor
GND	GND Bluetooth & Sound sensor
D4	RX
D3	TX
D12	Buzzer VCC
GND	Buzzer GND



WORKING:

A uniquely designed application is built up that will begin recording when the sound goes over the ideal level. The Arduino Nano board is utilized to which a Bluetooth recipient, a sound sensor, and a signal are associated. The Bluetooth is the sound crosses the set worth it will begin the chronicle on the cell phone. When the degree of commotion descends the chronicle is naturally halted

Cell phone and Application: Cell phone here goes about as an interface for the framework to work for us to control it. An application is created and introduced in the cell phone with a code that will start and quit recording as indicated by the shifting commotion level.

Arduino Nano: The Arduino Nano is an effective IoT hardware that comes with a lot of versatility. This acts as the mainboard to which all other components are connected to

Sound sensor: A sound sensor is associated with the Arduino Nano. The sound sensor consistently gauges the commotion level in the encompassing. There is an edge esteem set effectively in the application. When the commotion level crosses this worth the sound sensor will advise the ringer to send the message to the application.

Bell: The signal go about as a message passer in this framework. When the limit level is gotten it will educate the application through Bluetooth to begin the account. Additionally, thus the commotion level brings will start a message down to stop the account

Bluetooth HC 05: This is the remote network module in the framework. This associates the cell phone and the Arduino Nano.

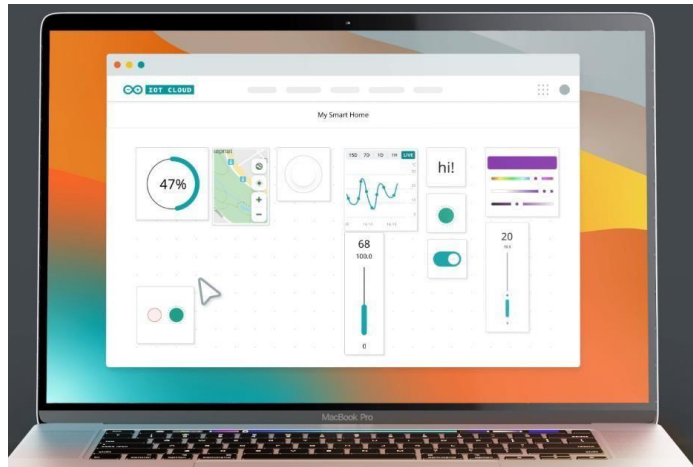
NOISE CLOUD:



Project data, simplified

Gather real time and historical data from your devices in one place, whether you are working with a simple project, or hundreds of variables.

All your data is stored in the cloud, updated automatically, and can be exported to a local device any time.



The new Arduino Cloud brings a lot of new things, and one of them is the OTA (over-the-air) feature. This feature allows you to upload programs wirelessly to your Arduino boards. This way, as soon as you have a compatible board connected to a WiFi network and configured to work with OTA, you won't need to physically connect the board to the computer in order to upload new sketches to it. Instead, everything will work over-the-air.

ADVANTAGES:

based commotion contamination checking framework is a machine to machine correspondence framework so information to be recorded will have extraordinary exactness. Likewise gadgets are remotely associated so robotization and controlling of it turns into a simple undertaking for a individual. It can record information with no human association. This framework saves great measure of time in light of the fact that whenever it is introduced, it works consequently. we simply need to peruse the information and investigate it. The greater part of the current commotion contamination recording gadgets are expensive contrasted with the IoT based gadgets, they are modest so they will save great measure of cash moreover

DISADVANTAGES:

As this gadgets are interconnected by means of web there are conceivable outcomes that they can get hacked or checked by malevolent clients or can be followed by other frameworks too. So the security of the recorded information can be an issue utilizing this sort of gadgets.

SCENARIO:

Baby Monitor with Sound Sensor:

Baby monitoring system assures the safety by monitoring its position continuously and it also reads the data from the respected sensors i.e., load cell, temperature sensor and the sound sensor. The data readings obtained from the sensors are processed to the Raspberry PI and if there are any abnormal values found then the PI camera captures an image and gives an alert to the parents through mail and the captured picture will be processed and analyzed using CNN to predict the position of the baby using predefined model. The data will also be updated in the cloud.

The main characteristics of this baby monitoring system are:

Raspberry pi is the control unit where all the components are connected to it and all the readings of the baby such as temperature, sound, weight are collected and processed.

Temperature sensor helps in identifying and noting the readings of the temperature of the baby and if it is above the threshold value it activates the PI camera.

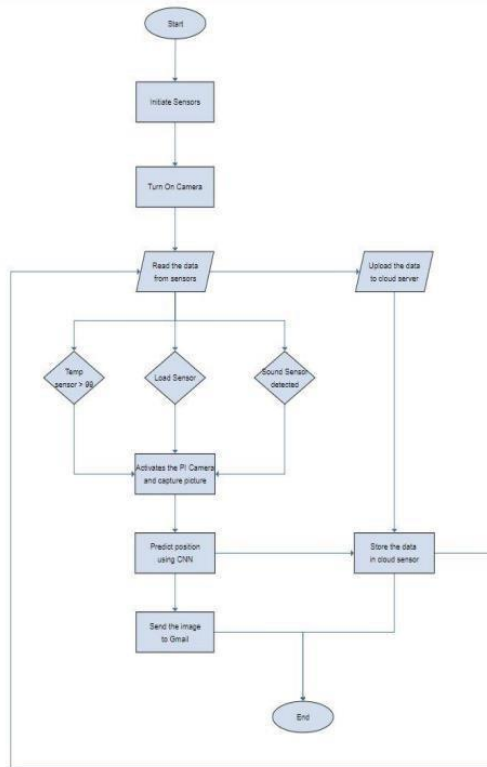
Sound sensor helps in detecting the cry of the baby and if the sound is detected continuously, it activates the PI camera.

Load sensor is used for weighing a baby. Using this reading, we can detect whether the baby is present or not.

Pi camera is a visual sensor which is used to capture images and send an alert through mail whenever the temperature sensor or the sound sensor detects the sound for some time.

The user will receive the alert of the position of the baby through Mail whenever any abnormal conditions occur like any changes in the readings of the temperature sensor or the sound sensor or both





Home Automation:



Sound detection plays a vital role from monitoring babies to turning on and off lights automatically to automatically detecting your dog's sound at the door and opening it up for them. Some commonly used sensors for sound detection includes SEN-12462 and EasyVR Shield for rapid prototyping. These sensors aren't as good as industrial grade sensors like those from 3d signal which can detect even ultra-low levels of noise and fine tune between various noise levels to build even machine break up pattern.



One of the most important parts of building a home automation product is to think about protocols, protocols that your device would use to communicate to gateways, servers, and sensors. A few years ago, the only way to do so was by either using Bluetooth, wifi or GSM. But due to added expenses on cellular sim cards, and low performance of Wifi, most such solutions didn't work.

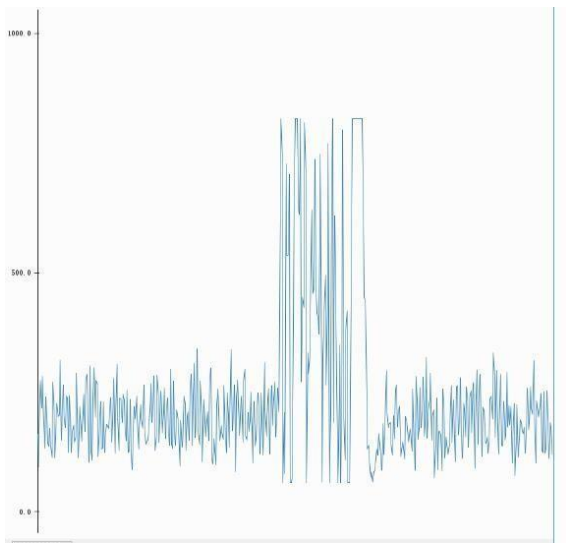
Bluetooth survived and later evolved as Bluetooth Smart or Bluetooth low energy. This helped bring a lot of connectivity in the "mobile server powered economy", in this essentially your phone would act as a middleware to fetch data from BLE powered sensors and sent it over to the internet.

When looking at the major home automation protocols, the following tops the list:

- Bluetooth low energy or Bluetooth Smart: Wireless protocol with mesh capabilities, security, data encryption algorithms and much more. Ideal for IoT-based products for smart homes.
- Zigbee: Low cost, mesh networked and low power radio frequency based protocol for IoT. Different Zigbee versions don't talk to each other.
- X10: A legacy protocol that utilizes powerline wiring for signaling and control
- Insteon: Communicates with devices both wirelessly and with wires
- Z-wave: Specializes in home automation with an emphasis on security
- Wifi: Needs no explanation

- UPB: Uses existing power lines installed in a home, reduces costs
- Thread: A royalty-free protocol for smart home automation, uses a 6lowpan
- ANT: An ultra low power protocol helping developers build low-powered sensors with a mesh distribution capabilities.
- 6lowpan

Outcomes:



CONCLUSION:

Noise pollution has gotten one of the serious issue for residents which moreover influences strength of the occupants. So the framework ought to be created to major the measure of noise level and as needs be moves ought to be made. In this paper one approach for IoT based noise pollution observing framework is introduced. The clamor contamination checking framework is essentially utilizing Arduino regulator to record what's more, measure information and sound sensor to significant measure of clamor. For checking commotion contamination of modern zones and urban communities this model can be additionally extended. Execution of this model can give efficient and minimal effort answer for constant checking of natural clamor. In this way the above project is a proficient commotion discovery with a programmed recording framework that can be