AUTO GREETING SYSTEM

A PROJECT BASED LEARNING REPORT

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BONAFIDE CERTIFICATE

Certified that this project report "**AUTO GREETING SYSTEM"** is the bonafide work of **"DHARANIDHARAN.R.K, INDHIRA KUMAARAN.S, JASWANTH T, MOOPANAR SHREERAM.B"** who carried out the Project Based Learning work under my supervision.

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ABSTRACT

We present the development of a Simple PIR Sensor-based Auto Greeting System aimed at creating an automated and personalized interaction experience. The system employs a Passive Infrared (PIR) sensor to detect motion within its vicinity. Upon detecting motion, the system engages an Arduino microcontroller to orchestrate a sequence of actions. These actions include the retrieval of pre-recorded audio greetings from an integrated SD card module. The selected greeting is then directed to an audio playback module, which interfaces with a speaker to audibly convey the message. To ensure power efficiency, the system integrates sleep modes, minimizing energy consumption during inactive periods. Through this combination of motion detection, microcontroller logic, audio storage and playback, and power management strategies, the Auto Greeting System presents an innovative solution for automated and welcoming interactions. This project showcases the potential of such a system to enhance engagement in a variety of scenarios, fostering an inclusive and user-centric environment.

CHAPTER-2

INTRODUCTION

In an era where human-computer interaction is becoming increasingly prevalent, the development of automated systems that facilitate personalized interactions is a compelling avenue of exploration. The Simple PIR Sensor-based Auto Greeting System presented in this project represents a significant stride in this direction. Leveraging cutting-edge technologies such as Passive Infrared (PIR) sensors, Arduino microcontrollers, SD card modules, and audio playback mechanisms, the system offers a seamless and engaging experience that transcends traditional modes of interaction .The core concept behind the Auto Greeting System revolves around detecting the presence of individuals within a designated space and responding with tailored audio greetings. This concept finds applications in a diverse range of scenarios, from retail environments seeking to enhance customer engagement to healthcare facilities aiming to provide a welcoming atmosphere for patients and visitors. By automating the greeting process, the system not only relieves the need for manual interventions but also imbues the interaction with a touch of personalization .This project delves into the intricate workings of the Auto Greeting System, encompassing the technical aspects that underpin its functionality. The journey includes the fundamental components—such as the PIR sensor responsible for motion detection, the Arduino microcontroller orchestrating the greeting sequence, and the SD card module housing an array of pre-recorded audio greetings. The interaction between these elements, facilitated by intricate programming and hardware interfacing, harmoniously culminates in the generation of a warm and inviting audio greeting .As we navigate through the pages that follow, we delve deeper into the technical intricacies that drive this innovative system. We explore how the system handles motion detection, processes signals, selects appropriate greetings, and effectively delivers them through a speaker. Furthermore, we uncover the energy-efficient strategies employed to optimize power consumption and prolong system longevity .The Auto Greeting System showcased herein is not merely a product of technological prowess; it embodies the potential to reshape user experiences across various domains. With the surge in automation and the desire for personalized interactions, this project resonates with the ever-evolving landscape of human-computer interaction. By practical applicability, the Auto Greeting System beckons a future where automated greetings extend a friendly hand to anyone who enters its sphere, transforming spaces into more welcoming and engaging environments
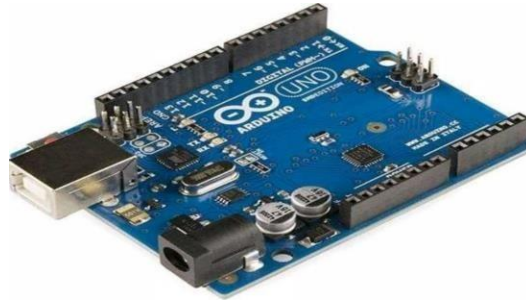
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3.1ARDUINO UNO

Figure : 3.1- ARDUINO UNO

Arduino UNO is a microcontroller board based on the **ATmega328P.** It has 14 digital input/outputpins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to get started. You can tinker with your UNO without worrying too much about doing somethingwrong, worst-case scenario you can replace the chip for a few dollars and start over again.

3.2 PIR sensor

figure 3.2 PIR Sensor

At the heart of the Auto Greeting System lies a technological marvel known as the Passive Infrared (PIR) sensor. Harnessing the principles of infrared radiation, the PIR sensor acts as the vigilant guardian, detecting subtle shifts in heat signatures that accompany the presence of living beings .With an intricate arrangement of pyroelectric materials, the PIR sensor operates on the simple yet ingenious premise that all living organisms emit heat in the form of infrared radiation. This phenomenon forms the basis for its motion-detecting prowess. As a person enters its field of view, the sensor perceives the change in the thermal landscape, translating it into an electrical signal that triggers the subsequent sequence of events. However, what sets the PIR sensor apart is its 'passive' nature. Unlike other sensors that actively emit signals and await reflections, the PIR sensor is content with observing the natural world. It stands as a sentinel, ready to sense the heat patterns without disturbing the equilibrium. This passivity not only contributes to its energy efficiency but also ensures seamless integration into diverse environments. The application of PIR technology in the Auto Greeting System underscores its versatility. From welcoming guests in hospitality settings to engaging patrons in retail spaces, the PIR sensor's ability to intuitively detect motion allows the system to create a dynamic and personalized interaction experience .As we delve deeper into the functionalities of the Auto Greeting System, the spotlight on the PIR sensor illuminates the convergence of scientific ingenuity and practical application. With its ability to decipher the language of infrared radiation, this unassuming sensor becomes the catalyst for a new era of automated, responsive, and engaging interactions.
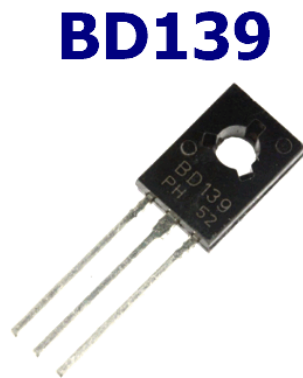
3.3 BD139 TRANSITOR

BD139

Figure 3.3 BD139

At the heart of the Auto Greeting System beats the pulse of technology, driven by the BD139 transistor—an unsung hero that orchestrates the intricate dance of signals, amplification, and control. This unassuming semiconductor component, with its commendable capabilities, ensures the seamless execution of the system's functions .The BD139, a versatile NPN bipolar junction transistor, showcases its prowess as a signal amplifier and switch. Its ability to magnify weak signals into potent commands allows it to bridge the gap between different parts of the system, lending coherence to the symphony of automation .Functioning as an amplifier, the BD139 takes the faint electrical signals from the Passive Infrared (PIR) sensor, which indicate the presence of motion, and magnifies them to a level that the Arduino microcontroller can discern. This amplification transforms subtlety into action, propelling the system's responsiveness to new heights .Moreover, the BD139's role as a switch cannot be underestimated. It deftly manages the flow of electrical current, translating the digital cues from the microcontroller into tangible results. When the time comes to activate the audio playback module and bring the speaker to life, the BD139 steps in with its switching capabilities, ensuring a seamless transition from command to execution .As the Auto Greeting System unfolds its magic, the BD139 transistor operates silently but decisively, epitomizing the harmony between the digital and analog realms. Its presence is a testament to the intricate tapestry of technology, where a seemingly modest component takes center stage, enabling a symphony of automated interactions .This project provides a glimpse into the world of electronics, where the BD139 embodies the philosophy that small components can yield immense power. Its contributions resonate in the subtleties of the system's operations, reinforcing the notion that precision in automation rests upon the shoulders of remarkable components like the transistor.

3.4 SPEAKER

Figure 3.4 speaker

In the Auto Greeting System, the speaker plays a crucial role in transforming digital commands into audible expressions. It converts electrical signals from the Arduino microcontroller into resonant sound waves, ensuring the delivery of pre-recorded greetings with clarity and warmth. Collaborating closely with the audio playback module, the speaker envelops the environment with welcoming auditory cues. Beyond its technical function, the speaker adds a human touch by infusing greetings with emotional nuances, enhancing the engagement and connection between the system and its users. In essence, the speaker bridges the gap between technology and sensory experience, orchestrating an interaction that is both automated and warmly human.

3.5 SD CARD MODULE

Figure 3.5-SD card module

In the intricate symphony of the Auto Greeting System, the SD card module takes on a role of paramount importance. This unassuming module, equipped with the power of digital storage, serves as the repository for a treasure trove of pre-recorded audio greetings that infuse warmth and personalization into interactions .At its core, the SD card module embodies versatility. It offers a compact yet capacious canvas on which an array of audio greetings can be stored in digital formats. This versatility allows the system to adapt to various scenarios, accommodating greetings that range from formal introductions to friendly salutations.

The SD card module's digital storage prowess is matched by its user-friendly accessibility. Adding or updating greetings is a seamless process, akin to arranging digital files in a familiar folder structure. This flexibility ensures that the greetings remain dynamic and aligned with evolving contexts.

In the system's operation, the Arduino microcontroller interacts with the SD card module, selecting the most fitting greeting to be delivered based on the detected presence. This interaction not only showcases the module's technological cooperation but also underscores its significance in enhancing user experiences.

As the Auto Greeting System extends its automated welcome, the SD card module quietly curates the auditory tapestry, ensuring that each interaction is tailored and resonant. It stands as a testament to the marriage of technology and human ingenuity, where a small module becomes the conduit for personalized greetings, transcending the boundaries of code and circuitry. In essence, the SD card module empowers automation with the warmth of human connection.

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3.6 Jumper cable

Figure 3.6 -JUMPER CABLE

In the realm of the Auto Greeting System, jumper cables play a pivotal role in creating seamless connections between components. These unassuming cables facilitate real-time communication, linking the Passive Infrared (PIR) sensor, Arduino microcontroller, and SD card module. With their plug-and-play design, jumper cables streamline the system's assembly process, embodying the project's focus on user-friendly automation. Despite their simplicity, these cables are instrumental in enabling the orchestration of greetings, amplification of audio, and interpretation of sensor data. As the Auto Greeting System extends its digital embrace, jumper cables silently underscore the significance of connectivity, harmonizing components into an engaging and automated experience.

CHAPTER - 4

CIRCUIT DIAGRAM &
DESCRIPTION

4.1CIRCUIT DIAGRAM

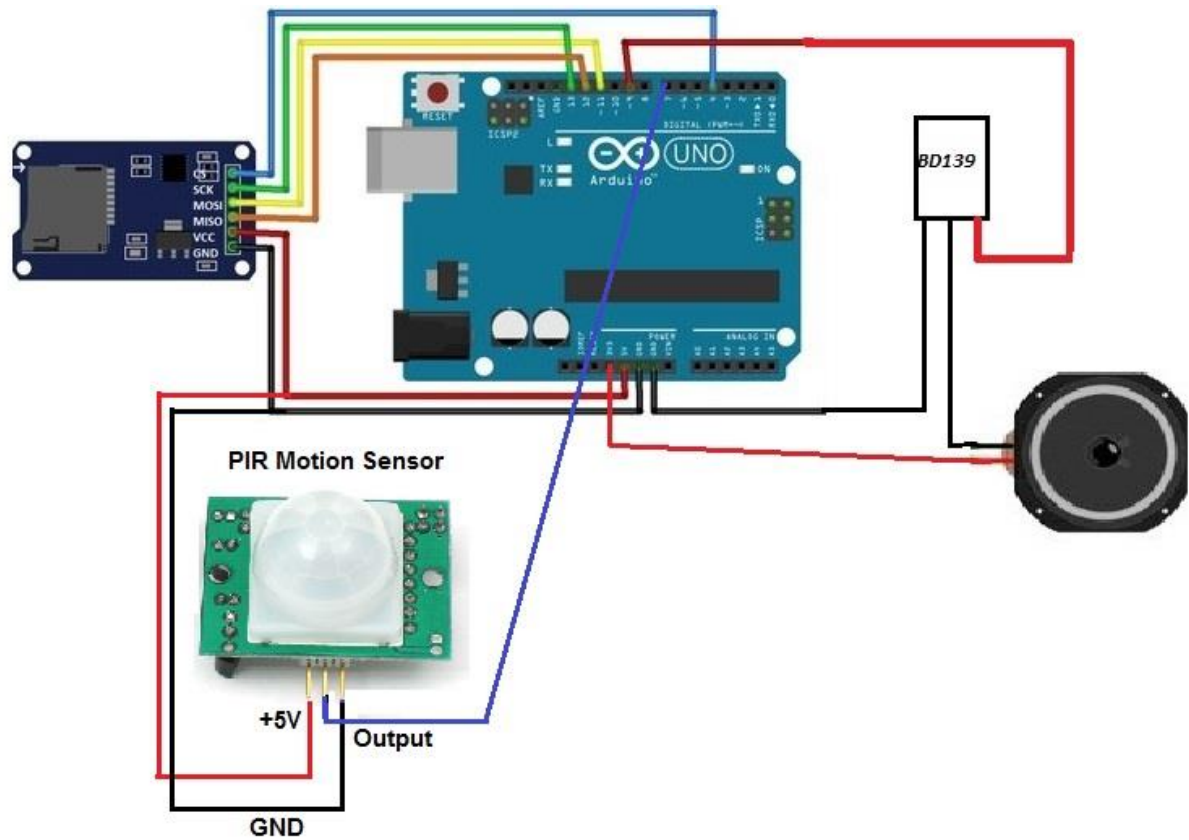**Figure** 4.1-CIRCUIT DIAGRAM

4.2 Code:

```
#include "SD.h"
#define SD_ChipSelectPin 4
#include "TMRpcm.h"
#include  "SPI.h"

TMRpcm tmrpcm;

void setup()
{


pinMode(7,INPUT);
delay(500);
}

void  loop()
{

if(digitalRead(7)==HIGH)
{

  AudioPlay();
  delay(3000);
  }
  }

void AudioPlay()
{
tmrpcm.speakerPin = 9;
Serial.begin(9600);
if  (!SD.begin(SD_ChipSelectPin)) {
Serial.println("SD fail");
return;
}

tmrpcm.setVolume(5);
tmrpcm.play("welcome.wav");
}
```

4.3 WORKING:

The operational essence of the Auto Greeting System unfolds through a meticulously choreographed sequence of events, orchestrated by a fusion of technology and design. At the heart of this symphony lies the PIR sensor—a sentinel that detects motion within its range.
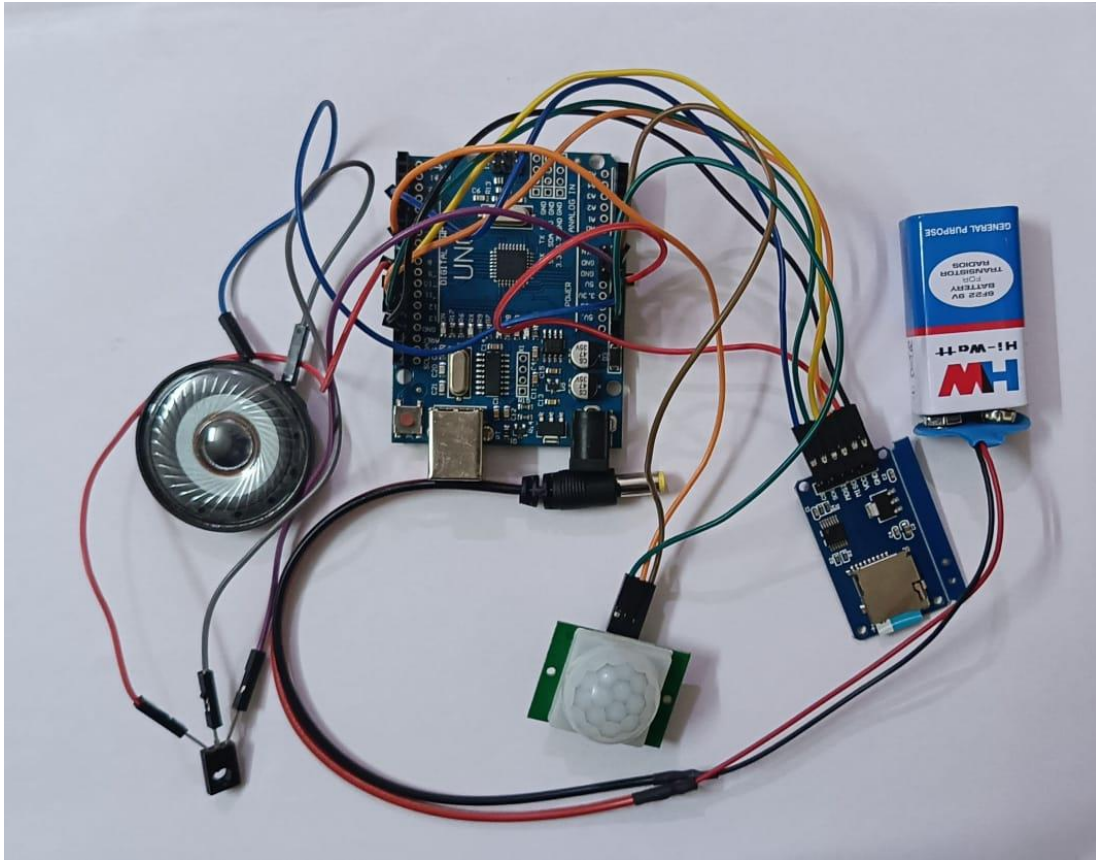
As an individual enters the PIR sensor's field of view, a cascade of actions ensues. The sensor's perceptive prowess triggers a signal that courses through the Arduino microcontroller. This signal acts as the catalyst, propelling the system into action .The Arduino, with its prowess in micro-level decision-making, takes command. It accesses the SD card module—an arsenal of pre-recorded audio greetings. Armed with information about the detected presence, the Arduino selects the most suitable greeting, mirroring the context of the interaction .With the greeting message in hand, the Arduino communicates with the audio playback module. This module deciphers the digital audio data and translates it into resonant sound waves. These waves are then directed to the speaker, which transforms them into audible greetings .Amidst this interaction, power efficiency is woven seamlessly. The Arduino employs sleep modes during idle times, conserving energy and ensuring that the system is primed for the next interaction .This orchestration—beginning with motion detection and culminating in the warm embrace of an automated greeting—embodies the convergence of technology and human-centric design. As the Auto Greeting System extends its welcoming hand to each entrant, it stands as a testament to the potential of automation to create personalized and engaging interactions. In the backdrop of this meticulously choreographed sequence, technology takes on a role that transcends mechanics—it becomes an agent of connection, extending a digital gesture of welcome.

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CONCLUSION

The journey of conceptualizing, designing, and implementing the Auto Greeting System has led us to a remarkable convergence of technology and human interaction. As we draw the curtain on this project, we find ourselves immersed in the realization that automation can indeed be a conduit for fostering warmth, engagement, and connection .The Auto Greeting System, with its intricate blend of components like the PIR sensor, Arduino microcontroller, SD card module, audio playback mechanism, and speaker, transcends the realm of mere functionality. It offers a glimpse into a future where technology seamlessly integrates with our surroundings, responding intuitively to our presence, and enhancing our experiences .The system's ability to detect motion and respond with personalized greetings resonates far beyond its technical specifications. It demonstrates the profound impact that automation can have on everyday interactions—be it in retail spaces, healthcare facilities, corporate environments, or educational institutions. The automated greetings, while algorithmically triggered, emanate a sense of thoughtfulness, creating a bridge between the mechanical and the human .As we reflect on the Auto Greeting System, we are reminded that while technology may initiate the process, it is the emotional resonance and human connection that linger. In this fusion, we find ourselves at the crossroads of possibility—where innovation extends a hand of welcome, where automation nurtures connection, and where technology becomes a vessel for crafting moments of warmth and interaction.

APPENDIX:

REFERENCE

https://projecthub.arduino.cc/munir03125344286/welcome-audio-by-using-pir-sensor-67186d