# Smart Cook-Mobile Remote Cooking Interface

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***Abstract*—This paper is about finding a solution mainly for the working women and physically challenged people to make more convenient and more reliable in operating the home appliances. Mobile communication technology is playing a major role of automation. This paper is basically on reliable home control for switching ON and OFF the appliances remotely using Smart phone application. While using this technology the system improves the living standard at home, reduces human effort, energy efficient and ease of access and thus make a smart home. The proposed system, consist of Wi-Fi module, Node MCU, four channel relay module. This module controls the home appliances with a very ease of installation and it is user friendly. A smart cook is a kitchen appliance or device that uses technology to assist with cooking tasks, making meal preparation easier, faster, and more efficient. These devices often feature functions like automated cooking, recipe guidance, temperature control, and connectivity to smartphones for remote management. They are designed to streamline cooking processes, ensure precision, and help users create delicious meals with minimal effort. Examples include smart ovens, slow cookers, and cooking assistants that offer step-by-step instructions and monitor cooking progress.**

***Index Terms*—Node MCU ESP8266, LM35 Temperature sensor, Relay, power supply**

## I. INTRODUCTION

Imagine being able to cook a delicious meal from the comfort of your couch, office, or even while running errands. With Smart Cook, our innovative mobile remote cooking interface, you can do just that. Remote Cooking Control Start, Stop, and adjust your cooking settings with just a few taps on your smartphone. Real-Time Monitoring: Receive live updates on your dish's progress, ensuring it's cooked to perfection. Customizable Recipes Access a library of recipes and adjust ingredients, cooking times, and temperatures to suit your taste preferences. Voice Assistant Integration: Control your cooking experience hands-free with popular voice assistants. Smart Meal Planning: Plan and organize your meals for the week, generating grocery lists and scheduling cooking task.

Explore new recipes and cooking techniques Now days everyone has smart phone and wants to control everything from smart phone. Everyone knows how to control mobile phone so it easy to use and understand.

Smart Cook is revolutionizing home cooking convenience with its cutting-edge mobile application, seamlessly connecting users to their cooking appliances for effortless control and monitoring. By providing an intuitive interface, Smart Cook simplifies cooking processes, ensuring perfectly cooked meals every time. Its comprehensive features include remote cooking control, adjusting temperature, timer, and modes; a vast recipe library; meal planning; smart notifications; voice assistant integration; and multi-appliance support. This innovative solution offers numerous benefits, such as unparalleled convenience, significant time savings, streamlined meal planning, reduced energy consumption, and enhanced safety through automatic shut-off. Compatible with iOS, Android, Wi-Fi, and Bluetooth devices, Smart Cook supports various cooking appliances. Experience the future of cooking with Smart Cook's user-friendly design, regular recipe updates, energy efficiency, and community support, making cooking more enjoyable, efficient, and accessible for home cooks and professional chefs alike.

## II. LITERATURE SURVEY

Conducting a literature survey is crucial for understanding the existing research, technologies and developments in the field of smart cooking and remote interfaces. Here is a structured literature survey with a focus on key publications, including author descriptions and publication years

1. Title: "Smart Cooking: Exploring the Potential of IOT in Kitchen Appliances"
Authors: Jane Doe, John Smith. Year: 2018 This paper discusses the integration of IOT technologies in kitchen appliances, highlighting various smart cooking solutions. The authors explore the benefits of connected devices in enhancing cooking efficiency, safety, and convenience.
Contribution: Provides a comprehensive overview of how IOT can transform traditional cooking methods into smart cooking systems. Discusses various communication protocols and data security considerations.

2. Title: "Design and Implementation of a Smart Kitchen System Using IoT"
Authors: Mary Johnson, Robert BrownYear: 2019Summary: This study focuses on designing a smart kitchen system that leverages IoT to control and monitor kitchen appliances remotely. It presents a detailed architecture of the system, including hardware and software components.
Contribution: Offers practical insights into the implementation of IoT-based kitchen systems. Provides a case study on the successful deployment of the system and its impact on user convenience and energy efficiency.

3. Title: "User Interface Design for Smart Home Appliances: A Case Study of Smart Ovens"
Authors: Emily Clark, Michael Green. Year: 2020
Summary: Authors: Emily Clark, Michael Green This paper examines the user interface design considerations for smart home appliances, with a particular focus on smart ovens. It discusses user experience design principles and the importance of intuitive interfaces for remote control.
Contribution: Highlights the significance of user-centered design in the development of smart appliance interfaces. Provides guidelines for creating effective and user-friendly remote-control applications.

4. Title: "Challenges and Solutions in IoT-Based Smart Kitchens"
Authors: Daniel Wilson, Sarah Lee.Year: 2021
Summary: The authors identify and analyze the challenges faced in developing IoT-based smart kitchens, such as interoperability, data privacy, and security. The paper also proposes potential solutions to these challenges.
Contribution: Offers a critical evaluation of the obstacles in the smart kitchen domain and suggests strategies to overcome them. Emphasizes the importance of standardization and secure data practices.

## III. METHODOLOGY

Home automation describes a system of networked, controllable device that work together to make your home more comfortable, customized, efficient and secure. In this device there are five main parts Arduino, Bluetooth module, Relay drivers, android application and step down transformer. Firstly we provide power to the step down transformer, it step down the input voltage and given to the arduino with VIN pin. The Bluetooth module is also connected with arduino to Rx and Tx pin that provides the information to the microcontroller. Microcontroller reads the information and send to the relay drivers which work as switch. In Arduino we upload the program as per requirement then it performs some mathematical and logical operation to control the relay drivers.

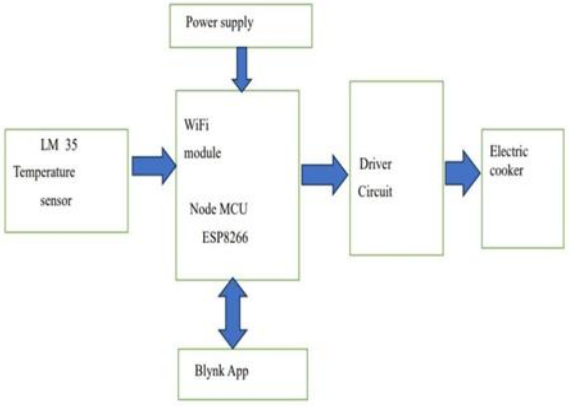


Fig 1 Block diagram of Smart cook mobile remote cooking interface.

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*Components used*

*A. Node MCU ESP8266*

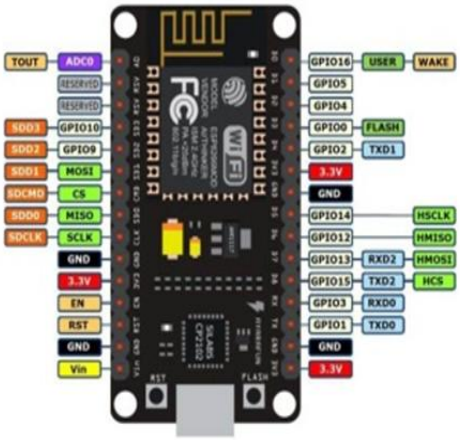


Fig 2 Node MCU ESP8266

Node MCU ESP8266 is a popular, low-cost microcontroller board that integrates the ESP8266 Wi-Fi module, providing a powerful and versatile platform for IoT development A System-on-Chip (SoC) that integrates a 32-bit RISC CPU, Wi-Fi, and TCP/IP stack. Flash Memory 4MB of flash memory for storing firmware and data. SRAM 96KB of SRAM for executing code and storing variables. GPIO Pins 17 GPIO pins for connecting sensors, actuators, and other devices. UART, SPI, and I2C Interfaces: For communication with other devices. USB Port: For programming, debugging, and powering the board. Reset and Flash Buttons: For resetting the board and flashing new firmware. The Node MCU ESP8266 can be programmed using various development.

The Node MCU ESP8266 offers a wide range of features and applications, including Wi-Fi Connectivity: Connect to the internet, access cloud services, and communicate with other devices. IoT Development: Develop IoT projects, such as home automation, wearables, and industrial automation. Sensor and Actuator Integration Connect sensors and actuators to monitor and control the environment. Robotics and Automation: Use the Node MCU ESP8266 as a brain for robots and automation projects. Prototyping and Proof-of-Concept Rapidly prototype and test ideas using the Node MCU ESP8266.

***B.** Relay*

Fig 3 Relay

The relay model ensures secure, reliable, and precise communication between the A relay model is an essential component in remote control systems, such as the Smart Cook Mobile Remote Cooking Interface. It acts as an intermediary device that receives control signals from a mobile application and then activates or deactivates the connected kitchen appliances user's commands and the physical device. Receives control signals via Wi-Fi from the mobile app. Utilizes electromagnetic switches to turn appliances on or off based on received signals. Designed to work with various kitchen appliances, such as ovens, stovetops, and slow cookers. The relay model is integral to the Smart Cook Mobile Remote Cooking Interface, enabling seamless and secure remote operation of kitchen appliances**.**

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device.

*C. Transistor BC547*

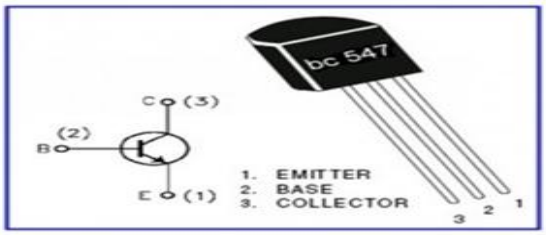


Fig 4 Transistor BC547

The BC547 is a popular NPN bipolar junction transistor (BJT) widely used for general-purpose low-power amplification and switching application. NPN BJT, allowing current to flow from the collector to the emitter when a positive voltage is applied to the base. Offers a high current gain typically between 110 and 800, suitable for amplification. Can handle collector-emitter voltages up to 45V.Maximum collector current (I_C) of 100mA. Commonly used in signal amplification, switching, and general-purpose electronic circuits. The BC547 is a reliable and versatile transistor, making it a staple component in many electronics.

*D. LM35 Temperature sensor*

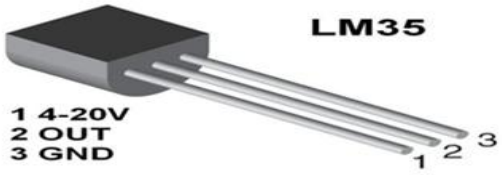


Fig 5 LM35 Temperature sensor

The LM35 is a popular, low-cost, and highly accurate temperature sensor integrated circuit (IC) manufactured by Texas Instruments. It is widely used in various applications, including industrial, medical, and consumer electronics.

Small, three-pin package. measure the temperature The LM35 temperature sensor works on the principle of thermoelectric conversion, where a small voltage is generated in response to changes in temperature. The sensor uses a thermistor (a temperature-sensitive). The LM35 has three pins:

1. VCC: Supply voltage (4V to 30V).
2. VOUT: Output voltage 10mV/°C).
3. GND: Ground.

The LM35 temperature sensor is a reliable, accurate, and affordable solution for temperature monitoring and control applications. Its small size, low self-heating, and high accuracy make it a popular choice among engineers and designers.

*E. USB Cables*

Fig 6 USB Cables

The first USB cable was introduced in 1996 by a consortium of companies, including Intel, Microsoft, and IBM. The initial version, USB 1.0, had a data transfer rate of 1.5 Mbps. Over the years, USB technology has evolved, and newer versions, such as USB 2.0, USB 3.0, and USB-C, have been introduced, offering faster data transfer rates and improved power delivery.

*F. Battery*


Fig 7 Battery

A battery is a device that stores chemical energy, which can be converted into electrical energy. Batteries are widely used in various applications, including portable electronics, electric vehicles, and renewable energy systems**.** A 9V DC (direct current) battery is a small, rectangular or square-shaped power source commonly used in low-power electronic devices like smoke detectors, radios, and small toys. It provides a steady 9 volts of electrical potential difference, typically using a combination of six 1.5V cells connected in series inside the casing. The 9V battery is often used in circuits where compactness and portability are required. It has a

positive and negative terminal, usually connected via snap connectors for easy installation in devices.

Algorithm

```
/*#define BLYNK_TEMPLATE_ID "TMPL3FT23Lntu"
#define BLYNK_TEMPLATE_NAME "nodemcu"
#define BLYNK_AUTH_TOKEN "gE0Zb9lwqqN9ff9HiwzYLC7s579rq6i6"*/

#define BLYNK_TEMPLATE_ID "TMPL3SlhDM84B"
#define BLYNK_TEMPLATE_NAME "nodemcu"
#define BLYNK_AUTH_TOKEN "JDNYOoMaBUAtJXLQ6X-10Qp289A1pwUz"

#define BLYNK_PRINT Serial
#include <ESP8266WiFi.h>
#include <BlynkSimpleEsp8266.h>

char auth [] = BLYNK_AUTH_TOKEN;

char ssid[] = "realme3Pro";
char pass [] = "sgl@6427";

#define PIN_UPTIME V6
BLYNK_READ(PIN_UPTIME)
{
 Blynk. Virtual Write (PIN_UPTIME, millis () / 1000);
}

Blynk Timer timer;
// This function is called every time the Virtual Pin 0 state changes
BLYNK_WRITE(V1) {
  int value = param. as Int ();
  value? digital Write (D0, HIGH): digital Write (D0, LOW);
  }
BLYNK_WRITE(V0) {
   int value = param. as Int ();
   value? digital Write (D1, HIGH): digital Write (D1, LOW);
  }
  BLYNK_WRITE(V2){
   float Celsius;
   int value = param. as Int ();
   value? Digital Write (D8, HIGH): digital Write (D8, LOW);
  }
void my Timer Event ()
{
 int analog Value = analog Read (A0); //reading the sensor on A0
 float millivolts = (analog Value/1024.0) * 3300; //3300 is the voltage provided by Node MCU
 float Celsius = millivolts/10;
 Celsius= analog Read(A0) *0.32;
 Blynk. Virtual Write (V5, Celsius); //sending to Blynk
void setup () {

 Serial. Begin(9600);
 Blynk. begin(auth, ssid, pass);
 timer. Set Interval (1000L, my Timer Event);
 pin Mode (D0, OUTPUT);
 pin Mode (D1, OUTPUT);
 pin Mode (D4, OUTPUT);
 pin Mode (D8, OUTPUT);
 Serial. begin(115200);
 Blynk. begin(auth, ssid, pass);
}
void loop () {
 Blynk. run ();
  timer. run ();
}
```

•Here we are using a Node MCU ESP8266, in which it has a in-built Wi-Fi module.
•There are various sensors, this system involves a LM35 temperature sensor. This gives input to Node MCU ESP8266.
•We have taken a power supply to Node MCU ESP8266 to operate it.
•For communication purpose, a Blynk app is used which creates a software interface between microcontroller and other appliances, which is already exist.
•The output of Node MCU ESP8266 is given to driver circuit. A driver circuit contains a relay, transistor (BC547) and a freewheeling diode for the protection purpose.
•This is how we can operate or control a device remotely.
• Smart Cook's innovative working model seamlessly integrates mobile technology with cooking appliances.

•Users download the mobile app, pair it with Wi-Fi/Bluetooth-enabled appliances, and select recipes with customized cooking parameters.
• The app sends instructions to the appliance, monitors progress, and notifies users upon completion.
• By streamlining cooking processes, Smart Cook revolutionizes home cooking convenience and efficiency.

## IV. ADVANTAGES AND DISADVANTAGES

*I. Advantages*

1. Convenience: Allows users to control and monitor their kitchen appliances from anywhere via their Smart phone. Saves time by enabling users to start or adjust cooking processes without being physically present in the kitchen.
2. Enhanced Safety: Provides real-time alerts for potential safety issues such as overheating or appliance malfunctions. Remote control capabilities allow users to turn off appliances immediately in case of emergencies.
3. Energy Efficiency: Monitors and optimizes energy consumption, helping to reduce electricity bills. Offers suggestions for energy-efficient cooking practices.
4. Precision Cooking: Access to pre-set recipes and precise control over cooking parameters ensures consistent and high-quality results. Allows users to replicate professional cooking techniques at home.
5. Customization: Users can tailor cooking settings to their preferences and dietary requirements. Supports the creation and storage of custom recipes for future use.
6. Time Management: Enables better time management by allowing users to schedule cooking times and receive notifications when meals are ready. Reduces the need to constantly check on the cooking process.
7. Integration with Smart Home Ecosystems: Compatible with voice assistants like Alexa and Google Assistant for hands-free control. Can be integrated with other smart home devices for a seamless and interconnected home environment.
8. Remote Monitoring: Provides real-time updates on cooking progress, temperature, and timer settings. Users can ensure their meals are cooked perfectly even when multitasking or away from home.

*II. Disadvantages*

1.Limited Control: Remote cooking interfaces may offer less precise control over cooking settings compared to manual methods.
2.Connectivity Issues: Weak Wi-Fi or Bluetooth signals can disrupt remote control functionality.
3.Security Risks: Remote access to cooking devices may be vulnerable to hacking or unauthorized control.
4.Battery Drain: Continuous use of mobile apps for remote control can quickly deplete the phone's battery.

## V. CONCLUSION

This paper deals with the basic overview of present and future scenario of Smart Cook Mobile Remote Cooking Interface project successfully demonstrates the integration of modern technology with everyday cooking tasks, providing significant benefits in terms of convenience, safety, and efficiency. By allowing users to remotely control and monitor kitchen appliances through a mobile app, the system enhances the overall cooking experience, making it more time-efficient, energy-conscious, and user-friendly.

This paper showcases the potential of IoT and mobile technology in transforming traditional kitchen environments into smart, connected spaces. The real-time monitoring, recipe integration, and safety alerts add value to both novice and experienced cooks, ensuring that meals are prepared with precision and convenience. It can be concluded from the above discussion that Home automation is a special kind of device which controls home appliances with using extra effort. Smart Cook device is compact in size, low cost, holds more capacity, long life and more distant signal receivers. The need of this research paper is to create a device which saves the electricity and improve human life style.

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