SRM

INSTITUTE OF SCIENCE & TECHNOLOGY

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LOW POWER TRANSMISSION USING LORA TECHNOLOGIES

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ABSTRACT

Along with the commercialization of the Internet of Things (IoT) technology, the demand for low-power and long-range, large amount of data transmission arises. However, there has been no such communication technology to satisfy the transmission. The Wi-Fi is able to send large amounts of data with its broadband technology, but because of high power consumption, it has to use firm power. The purpose of this study is to overcome those problems, design and suggest the multi interface communication module supporting LoRa technology

Key words: LoRa Technology, IoT, Long Range Communications, Energy Efficiency.

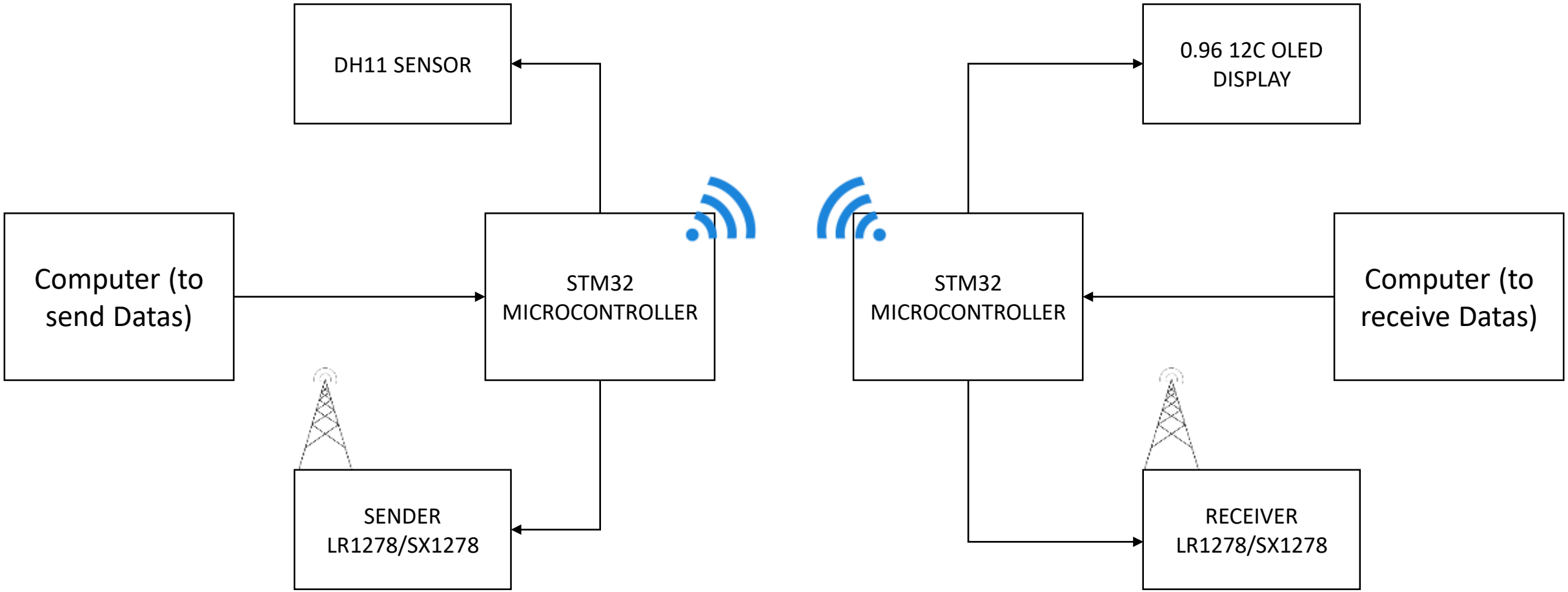
INTRODUCTION

Problem Statement: Interferences in Marine Communication.

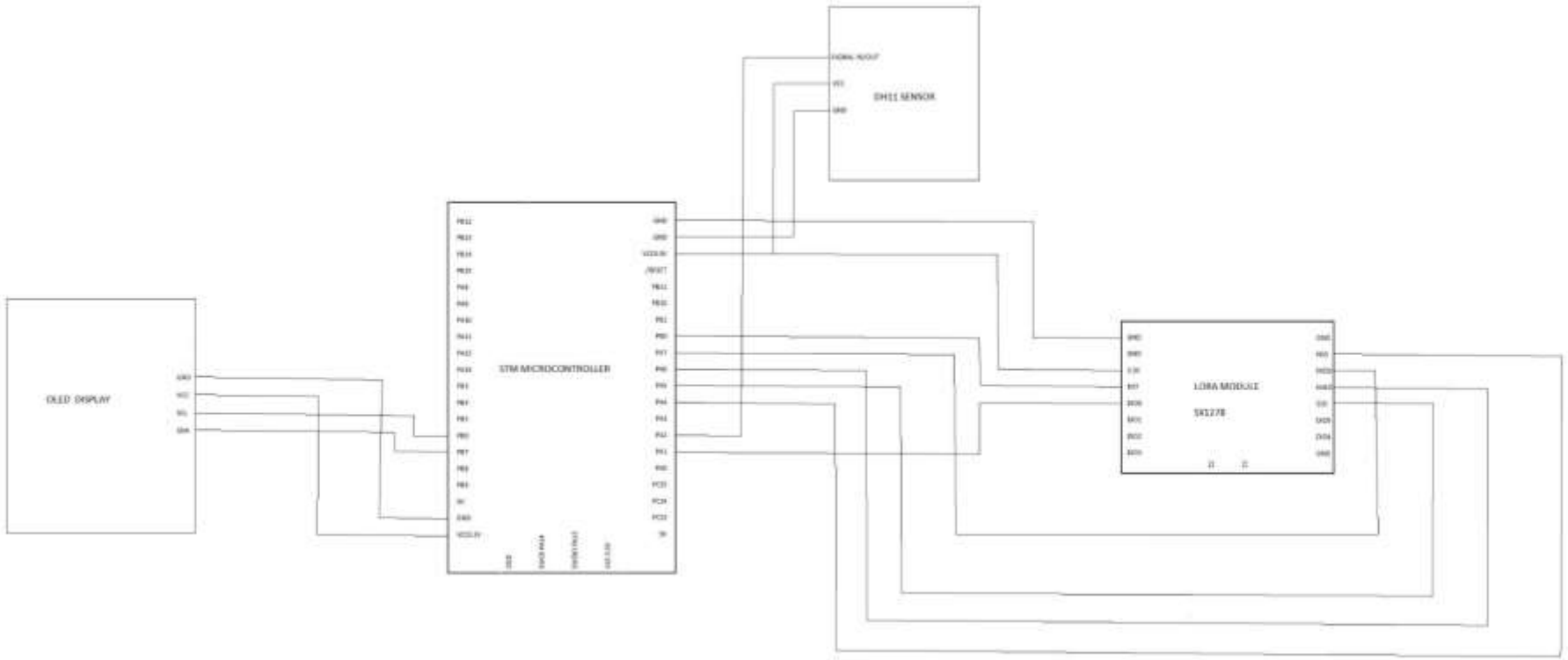
Solution: Using LoRa Technologies instead of using Traditional Communication Systems.

- Maritime communication has always been a challenge due to the vast and unpredictable sea environment.
- Traditional systems: Expensive and consume a lot of power.
- Closer to the shore, technologies are provide with some solutions, but they are not always energy-efficient, especially for small boats and battery-powered devices.
- LoRa (Long Range) technology, a type of Low Power Wide Area Network (LP-WAN), offers long-distance communication
- Ideal for tracking boats, monitoring ocean conditions, and enhancing safety operations.
- In this study,We have introduced LoRa Technology instead of using Traditional Technologies to provide long distance Communications.

BLOCK DIAGRAM



CIRCUIT DIAGRAM



HARDWARE COMPONENTS

SENDER CODE

```
#include <SPI.h>
#include <LoRa_STM32.h>
#define SS PA4
#define RST PB0
#define DI0 PA1
#define TX_P 17
#define BAND 915E6
#define ENCRYPT 0x78
int counter = 0;
void setup()
{
  Serial.begin(115200);
  while (!Serial);
  Serial.println("LoRa Sender");
  LoRa.setTxPower(TX_P);
  LoRa.setSyncWord(ENCRYPT);
```

```
  LoRa.setPins(SS, RST, DI0);
  if (!LoRa.begin(BAND))
  {
 Serial.println("Starting LoRa failed!");
    while (1);
  }
}
void loop() {
  Serial.print("Sending packet: ");
  Serial.println(counter);
  // send packet
  LoRa.beginPacket();
  LoRa.print("hello ");
  LoRa.print(counter);
  LoRa.endPacket();
  counter++;
  delay(5000);
}
```

RECEIVER CODE

```
#include <SPI.h>
#include <LoRa_STM32.h>
#define SS PA4
#define RST PB0
#define DI0 PA1
#define TX_P 17
#define BAND 915E6
#define ENCRYPT 0x78
void setup()
{
 Serial.begin(115200);
 while (!Serial);
 Serial.println("LoRa Receiver");
 LoRa.setTxPower(TX_P);
 LoRa.setSyncWord(ENCRYPT);

 LoRa.setPins(SS, RST, DI0);
 if (!LoRa.begin(BAND))
 {
```

```
    Serial.println("Starting LoRa failed!");
    while (1);
  }
}
void loop() {
  // try to parse packet
  int packetSize = LoRa.parsePacket();
  if (packetSize) {
    // received a packet
    Serial.print("Received packet '");
    // read packet
    while (LoRa.available()) {
      Serial.print((char)LoRa.read());
    }
    // print RSSI of packet
    Serial.print("' with RSSI ");
    Serial.println(LoRa.packetRssi());
  }
}
```

OUTPUT

From Sender LoRa:

LoRa Sender

Sending packet: 0

Sending packet: 1

Sending packet: 2

Sending packet: 3

...

From Receiver LoRa:

hello 0

hello 1

hello 2

hello 3

...

REFERENCES

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THANK YOU