# VISVESVARAYA TECHNOLOGICAL UNIVERSITY

**Jnana Sangama, Belagavi, Karnataka–590014**

Mini-Project Report

On

**"Arduino-based Radar that uses ultrasonic sensors to detect nearby objects in real-time"**

Submitted in partial fulfillment of the requirements for the award of degree of

**Bachelor of Engineering**

in

**Electronics and Communication Engineering**


Submitted by

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**DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING**
**BANGALORE INSTITUTE OF TECHNOLOGY**
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**2024-2025**

# BANGALORE INSTITUTE OF TECHNOLOGY

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## Department of Electronics and Communication Engineering

## CERTIFICATE

Certified that the mini-project work entitled **Arduino-based Radar that uses ultrasonic sensors to detect nearby objects in real-time** carried out by **Mr. Sumeet Shankar (1BI22EC159), Mr. Vishal Bettad (1BI22EC180), Mr. Siddesh Hulagur (1BI22EC149), Mr.Sidha Reddy (1BI22EC150)** a bonafide student of **Bangalore Institute of Technology** in partial fulfillment for the award of **Bachelor of Engineering/ Bachelor of Technology** in **Electronics and Communication Engineering** of the Visvesvaraya Technological University, Belgaum during the year 2024- 2025. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the Report deposited in the departmental library. The Mini-project report has been approved as it satisfies the academic requirements in respect of Mini-Project work prescribed for the above said Degree.

| | |
|---|---|
| **Bhavya K B** | **Dr. Hemanth Kumar A R** |
| Assistant Professor | Professor & Head |
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## Acknowledgement

We would like to thank my guide **Bhavya K B**, Assistant Professor, Electronics and Communication Department, Bangalore Institute of Technology, Bengaluru for guiding untiringly all through my tenure.

We would like to thank the Mini Project Coordinator **Keshava A**, Assistant Professor, Electronics and Communication Department, Bangalore Institute of Technology, Bengaluru for their guidance.

We would like to thank **Dr. Hemanth Kumar A.R,** Head of the Department Electronics and Communication Department, Bangalore Institute of Technology, Bengaluru for this opportunity to present this **Mini Project** on **"Arduino-based Radar that uses ultrasonic sensors to detect nearby objects in real-time"** of our choice and interest.

We extend my gratitude to **Dr. Aswath M U**, Principal, Bangalore Institute of Technology, Bengaluru, for his encouragement and support.

We are fortunate for being part of Bangalore Institute of Technology, the institution that stood by our side and assisted us towards successfully completing the **Mini Project.** We also take this opportunity to thank the Department of Electronics and Communication, Bangalore Institute of Technology for their tremendous help and guidance.

**Sumeet Shankar** **(1BI22EC159)**
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# ABSTRACT

This project presents the development of an Arduino-based radar system that utilizes ultrasonic sensors to detect nearby objects in real-time and estimate their width. The system measures distances by emitting ultrasonic waves, which are reflected back from objects, allowing the Arduino microcontroller to calculate the distance to each object. By rotating the sensor and capturing multiple distance readings at different angles, the radar can estimate the width of detected objects, providing a basic spatial representation of the environment. Real time feedback on object proximity and width can be visualized or output through various means, offering an accessible, cost-effective tool for basic object detection.

# TABLE OF CONTENTS

# LIST OF FIGURES

# BANGALORE INSTITUTE OF TECHNOLOGY

## VISION

To establish and develop the Institute as a centre of higher learning, ever abreast with expanding horizon of knowledge in the field of engineering and technology, with entrepreneurial thinking, leadership excellence for life-long success and solve societal problem.

## MISSION

- Provide high quality education in the engineering disciplines from the undergraduate through doctoral levels with creative academic and professional programs.
- Develop the Institute as a leader in Science, Engineering, Technology and management, Research and apply knowledge for the benefit of society.
- Establish mutual beneficial partnerships with industry, alumni, local, state and central governments by public service assistance and collaborative research.
- Inculcate personality development through sports, cultural and extracurricular activities and engage in the social, economic and professional challenges.

## LONG TERM GOALS

- To be among top 3 private engineering colleges in Karnataka and top 20 in India.
- To be the most preferred choice of students and faculty.
- To be the preferred partner of corporate.
- To provide knowledge through education and research in engineering.
- To develop in each student mastery of fundamentals, versatility of mind, motivation for learning, intellectual discipline and self-reliance which provide the best foundation for continuing professional achievement.
- To provide a liberal; as well as a professional education so that each student acquires a respect for moral values, a sense of their duties as a citizen, a feeling for taste and style, and a better human understanding.

# DEPARTMENT OF ELECTRONICS AND COMMUNICATION

## VISION

Imparting **Quality Education** to achieve **Academic Excellence** in Electronics and Communication Engineering for **Global Competent Engineers**.

## MISSION

- Create **state of art infrastructure** for quality education.
- Nurture **innovative concepts** and problem **solving skills**.
- Delivering **Professional Engineers** to meet the **societal needs**.

## PROGRAM EDUCATIONAL OBJECTIVES

- Prepare graduates to be **professionals**, Practicing engineers and entrepreneurs in the field of Electronics and communication.
- To acquire sufficient knowledge base for **innovative techniques** in design and development of systems.
- Capable of competing globally in **multidisciplinary** field.
- Achieve personal and professional success with awareness and commitment to **ethical and social responsibilities** as an individual as well as a team.
- Graduates will maintain and improve technical competence through **continuous learning process**.

## PROGRAM SPECIFIC OUTCOMES

**PSO1:** Core Engineering: The graduates will be able to apply the principles of Electronics and Communication in core areas.

**PSO2:** Soft Skills: An ability to use latest hardware and software tools in Electronics and Communication engineering.

**PSO3:** Successful Career: Preparing Graduates to satisfy industrial needs and pursue higher studies with social-awareness and universal moral values.