

Project Proposal: Radar System with B-L475E-IOT01A board

Abstract—This aims to design and develop a radar system using the B-L475E-IOT01A board for object detection and distance measurement, while ensuring real-time data transmission.

Keywords—*radar, Time-of-flight Sensor, Wi-Fi, UART, DAC Speaker*

I. GROUP MEMBERS

- Guo Cheng
- Shiyuan Qiao
- Yida Pan
- Zhiheng Zhou

II. DESCRIPTION OF PROJECT

A. Description

This project endeavors to create a radar system. By integrating a Time-of-Flight Sensor, Wi-Fi, UART, and a DAC Speaker, this system will enable accurate object detection, precise distance measurement, and real-time data transmission.

B. Application Features

- **Time-of-Flight Sensor:** This component will be used in object detection and distance measurements.
- **QSPI Flash:** The QSPI Flash module is designated to store the information acquired from the Time-of-Flight Sensor.
- **UART:** UART will draw the distance between the board and the detected object, and it will transmit the information to the DAC speaker when distance becomes too small.

- **DAC Speaker:** DAC Speaker will serve as an alert system, providing timely warnings when getting too close to a detected object.

III. PROJECT MILESTONE

- Phase 1: Preparation and Hardware Setup
 - Develop an initial design for further refinement
 - Hardware setup based on specifications.
- Phase 2: Implementation
 - Refine the initial design, ensuring practicality for implementation
 - Implement refined design in C code.
- Phase 3: Unit Test
 - Apply unit tests to validate component performance.
- Phase 4: Integration and Integral Test
 - Integrate tested parts into the overall radar system.
 - Apply integral tests to validate the overall radar system performance.
- Phase 5: Optimization
 - Optimize the radar system to improve its accuracy and efficiency.

IV. PLANNED TIMELINE

	Phase1	Phase2	Phase 3
W1	Initial Design (1 Day)	Setup and Refine Design (1 Day)	Implementation (5 Days)
W2	Unit Test (2 Days)	Integrate all parts (2 Days)	Integral Test (2 Days) Initial Demo
W3	Optimization (3 Days)		Unit Test (4 Days)
W4	Integrate all parts (3 Days)		Integral Test (3 Days) Final Demo