Assumption College Samutprakarn

PROJECT REPORT IN COMPUTER

AGRICULTUE OR FISHERIES SYSTEM

Feeding Aquatic Creature

SUBMITTED BY

Kantapon Thanootham M.5/2 No.8
Krit Nantawattananukul M.5/2 No.12
Thanakorn Kantaphanitchakarn M.5/4 No.15
Chitsanupong Srijoom M.5/4 No.17

SUBMITTED TO

Master Ronie Molina
Master Atiphan Thoongsook

TABLE OF CONTENTS

INTRODUCTION

Agriculture and fisheries are vital for human sustenance, providing food, raw materials, and economic opportunities. Agriculture focuses on crop cultivation and livestock, while fisheries manage aquatic organisms. Both play critical roles in feeding the global population and ensuring food security, especially for coastal communities, relying on natural resources like soil, water, and biodiversity.

Technological advancements, such as mechanized farming and aquaculture, have enhanced productivity, but challenges like climate change, overfishing, and land degradation persist. Sustainable practices, including precision farming and responsible fisheries management, are essential for balancing human needs with environmental conservation and ensuring long-term sustainability.

OBJECTIVES

Objectives of Food Production Systems

1. Ensure a stable food supply for local and export needs.
2. Boost economic growth through jobs and trade.
3. Promote sustainable use of natural resources.
4. Integrate modern technologies to improve efficiency.
5. Support equitable access to resources for farmers.
6. Protect the environment from degradation.

Objectives of Fisheries Systems

1. Provide reliable protein sources for food security.
2. Balance resource use to prevent overfishing.
3. Contribute to economic growth through fisheries and aquaculture.
4. Conserve marine biodiversity and ecosystems.
5. Use advanced technologies to enhance sustainability.
6. Empower coastal communities with better resources and opportunities.

KEY COMPONENTS

Esp32 microcontroller : act as a brain of the system, processing data from switch, controlLing display, and manaGing alerts. It's programming to activate the aLarm based on sensor reading

Oled display : received data from esp32 and display on screen.

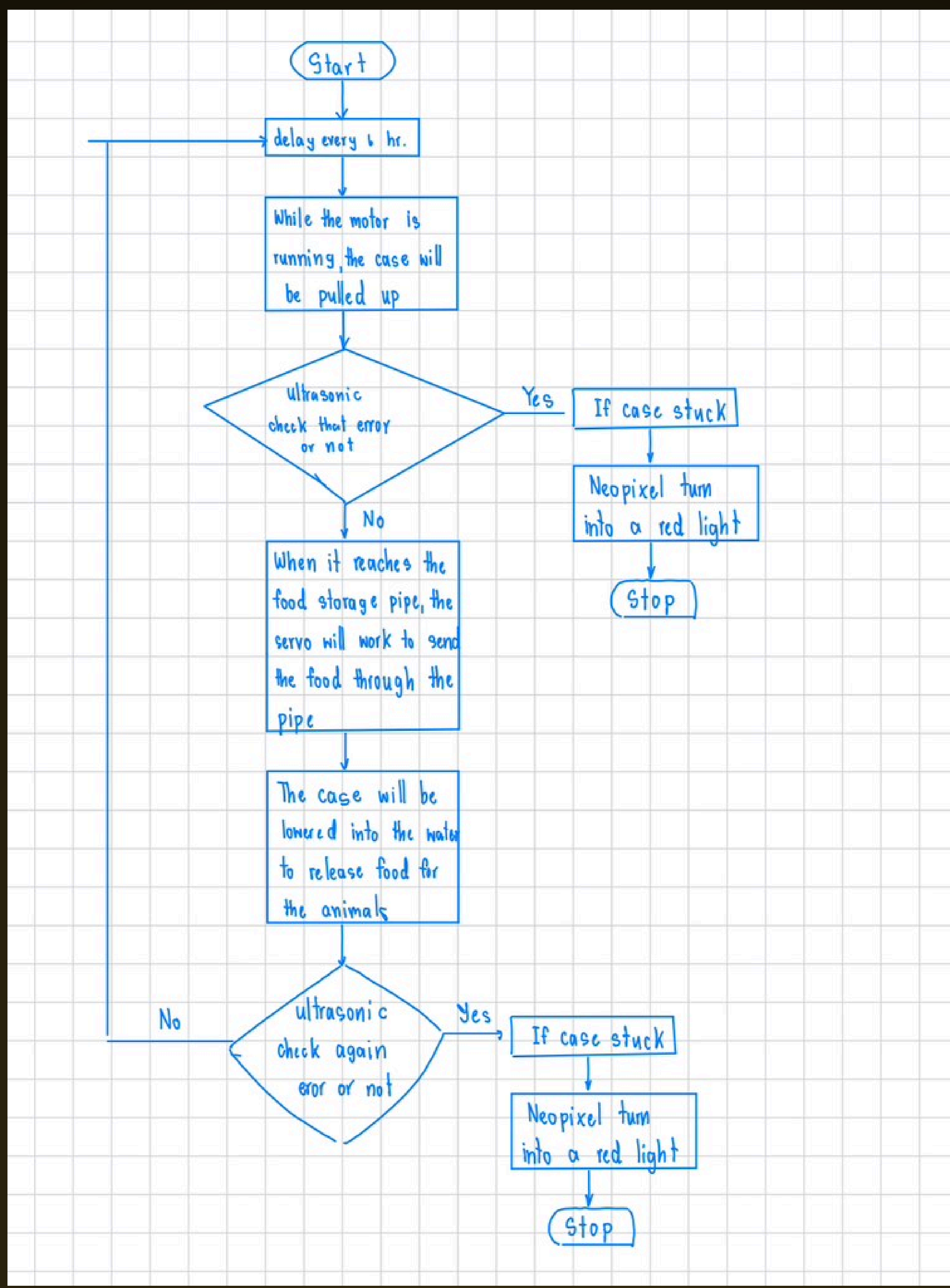
Buzzer : send alarm to aLert owner when activated.

Switch : press switch to activate the servo to open food storage

Servo : to rotate the food storage door

Led : turn green light when food storage door open and turn red light when food storage close.

System **Architecture**



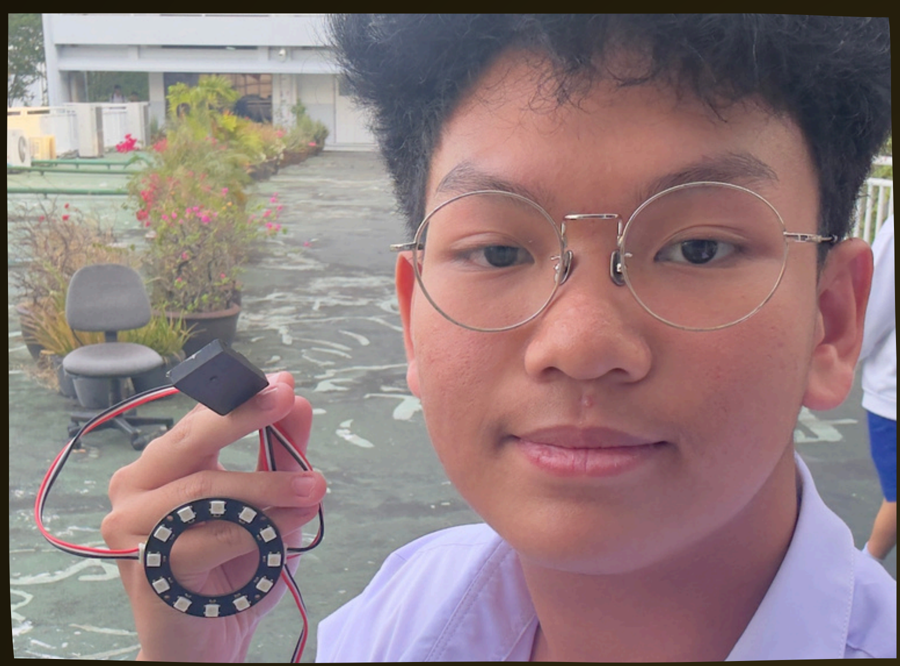
Following stages of the diagram

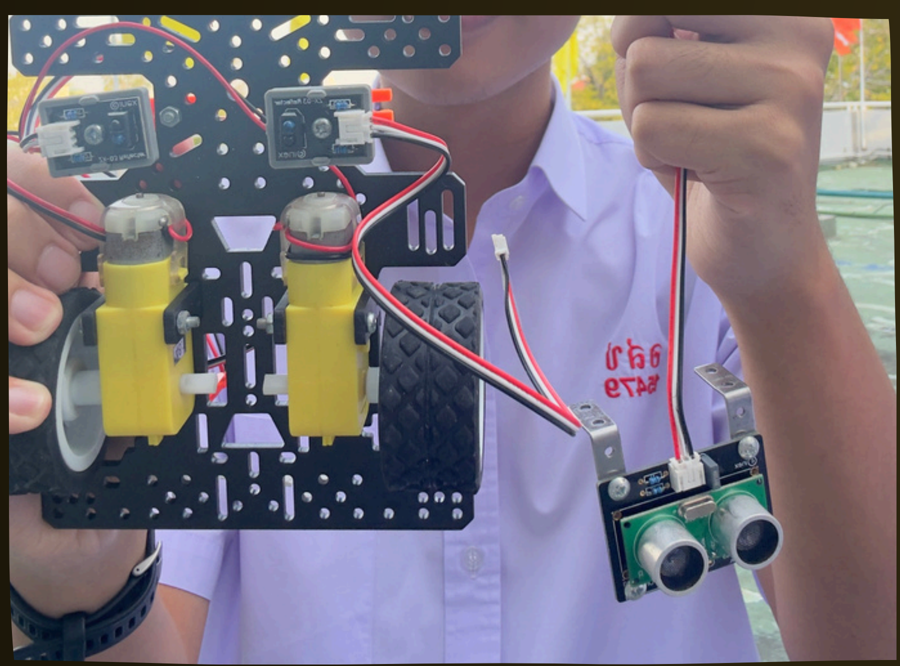
1. Press switch to activate servo and LED turn green
2. OLED Screen display open
3. Buzzer activate to alert owner
4. Servo open for 10 second then close and LED turn red
5. OLED Screen display close

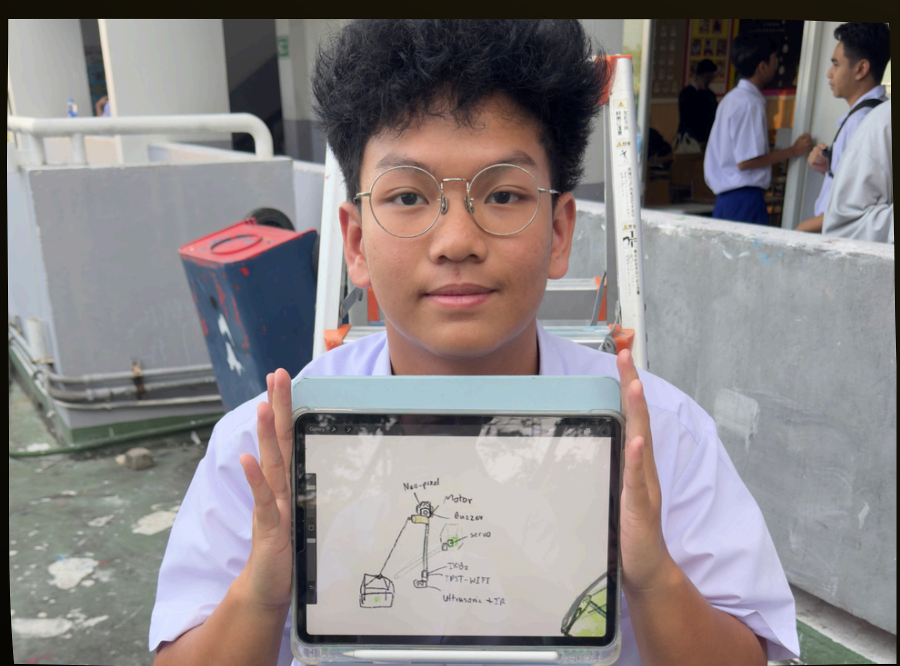
Revise:

Your reports are well-structured, but enhancing them with text formatting and color can make them more engaging. Use bold or larger fonts for headings (consistent font-style), and highlight key points with colors like blue for emphasis or green for positive outcomes. A consistent color scheme and clear lists can improve readability, while infographics or icons add visual appeal. These changes will make the reports more polished and effective.

Methodology







Collecting the Components

The IKB-1Z and Ipst-WiFi microcontrollers were selected as the central processing units for their ability to integrate seamlessly with various sensors and outputs. A buzzer and Neopixels were incorporated for entertainment purposes, ensuring functionality while providing visual and audible cues. The ultrasonic and infrared sensors were used in tandem to achieve stable and accurate objectives. A motor was employed to control the vertical movement of the rope, allowing it to descend into and ascend from the ocean. Additionally, a servo motor was utilized to open and close the storage compartment designed to hold food for aquatic creatures. This carefully selected combination of components ensures that the system functions efficiently and meets its intended goals.

Planning the layout

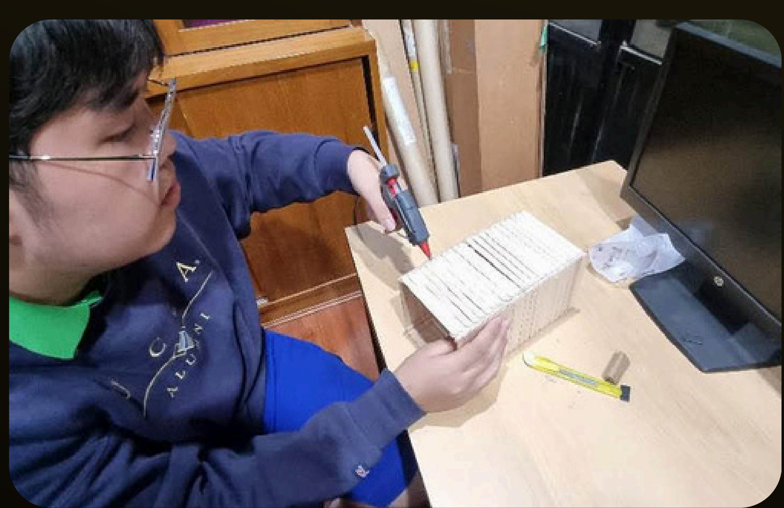
We use ultrasonic and irfrared sensor
to define about the object when
its coming up and we use IKB-z and
ipst-wifi to control all the sensor and we use
buzzer and neo-pixel
to only entertain and make our
project colorful And the most important sensor
are servo and motor sensor we use motor to
control our object to move up or down and we
use servo sensor to open or close our storage

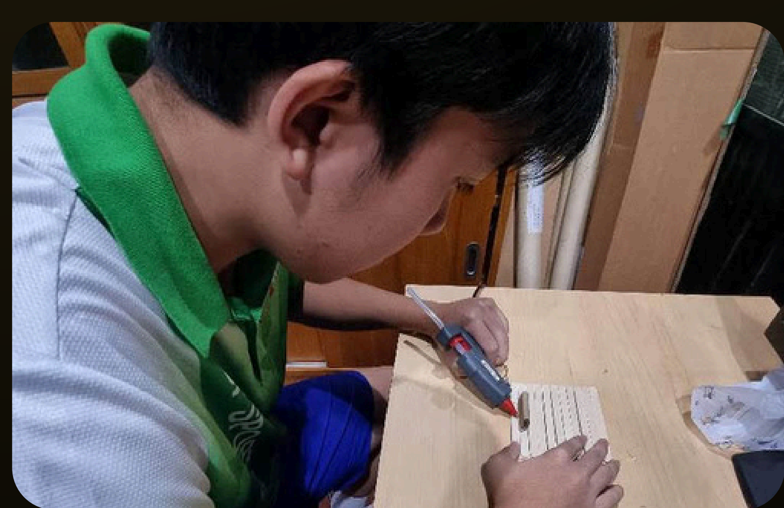
Planning the layout

WE USE ULTRASONIC AND IRFRARED SENSOR TO DEFINE ABOUT THE OBJECT WHEN ITS COMING UP AND WE USE IKB-Z AND IPST-WIFI TO CONTROL ALL THE SENSOR AND WE USE BUZZER AND NEO-PIXEL TO ONLY ENTERTAIN AND MAKE OUR PROJECT COLORFUL AND THE MOST IMPORTANT SENSOR ARE SERVO AND MOTOR SENSOR WE USE MOTOR TO CONTROL OUR OBJECT TO MOVE UP OR DOWN AND WE USE SERVO SENSOR TO OPEN OR CLOSE OUR STORAGE

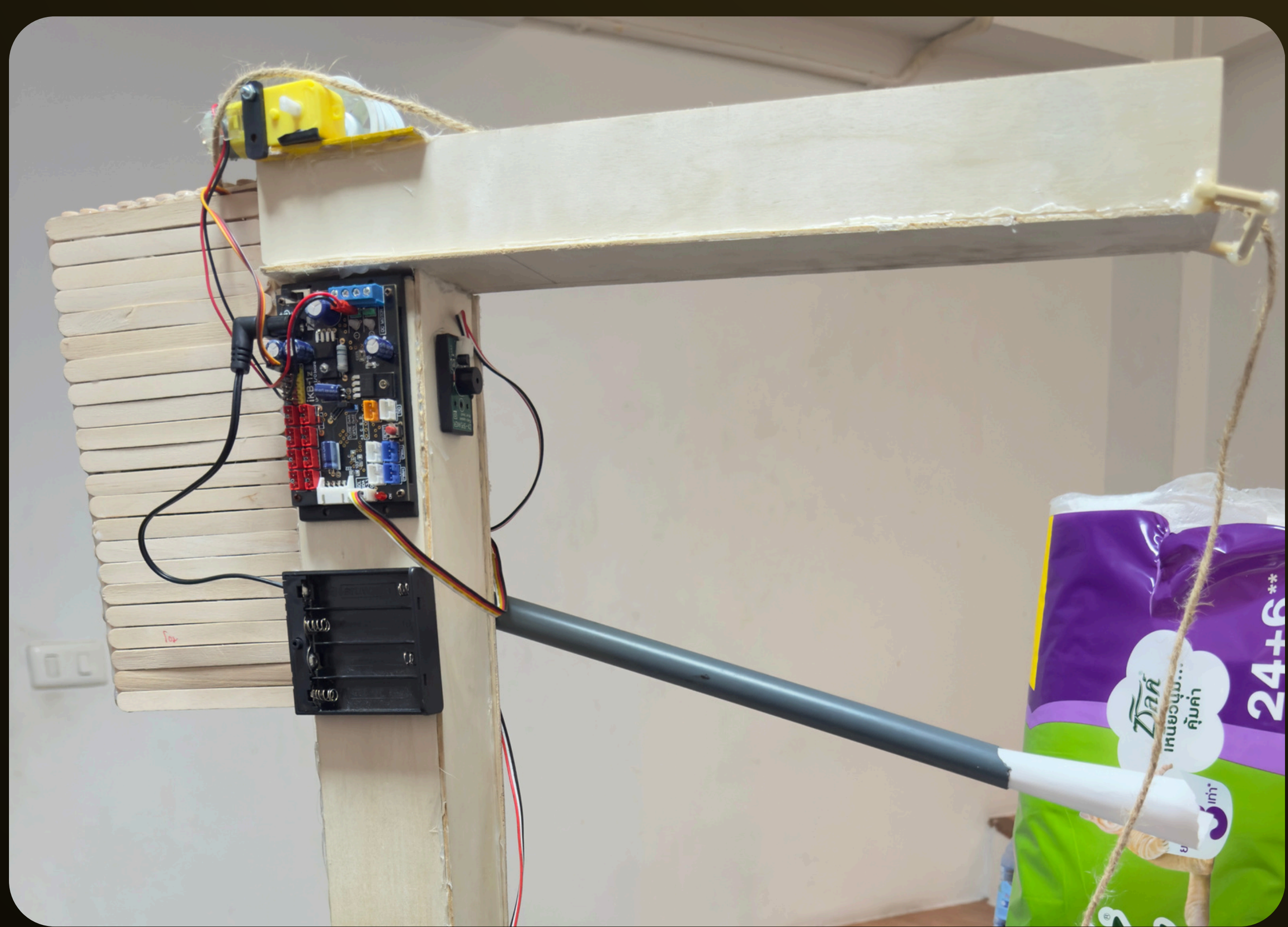
Placing all the components

WE HAVE FOCUSED ON PLANNING WHERE TO INSTALL VARIOUS COMPONENTS AND HAVE STARTED BUILDING THE PILLAR, STORAGE AND CAGE BY USING WOODEN BOARDS WE PREPARED. WE ALSO TESTED ATTACHING VARIOUS SENSORS TO THE WOODEN FRAME AS PLANNED AND CHECKED TO ENSURE IT IS STURDY AND FUNCTIONAL.





BY THE END OF WEEK 7, THE TEAM SUCCESSFULLY CREATED A STABLE, ORGANIZED PROTOTYPE. THE REMAINING COMPONENTS HAVE BEEN ASSEMBLED PERFECTLY ACCORDING TO THE PLAN. THEY HAVE BEEN TESTED FOR STRENGTH AND ARE READY FOR USE. THE NEXT STEP IS TO WAIT FOR THE PROGRAMMING AND CODING PHASE TO PROCEED.



PROGRAMMING, INITIAL TESTING, AND SYSTEM INTEGRATION

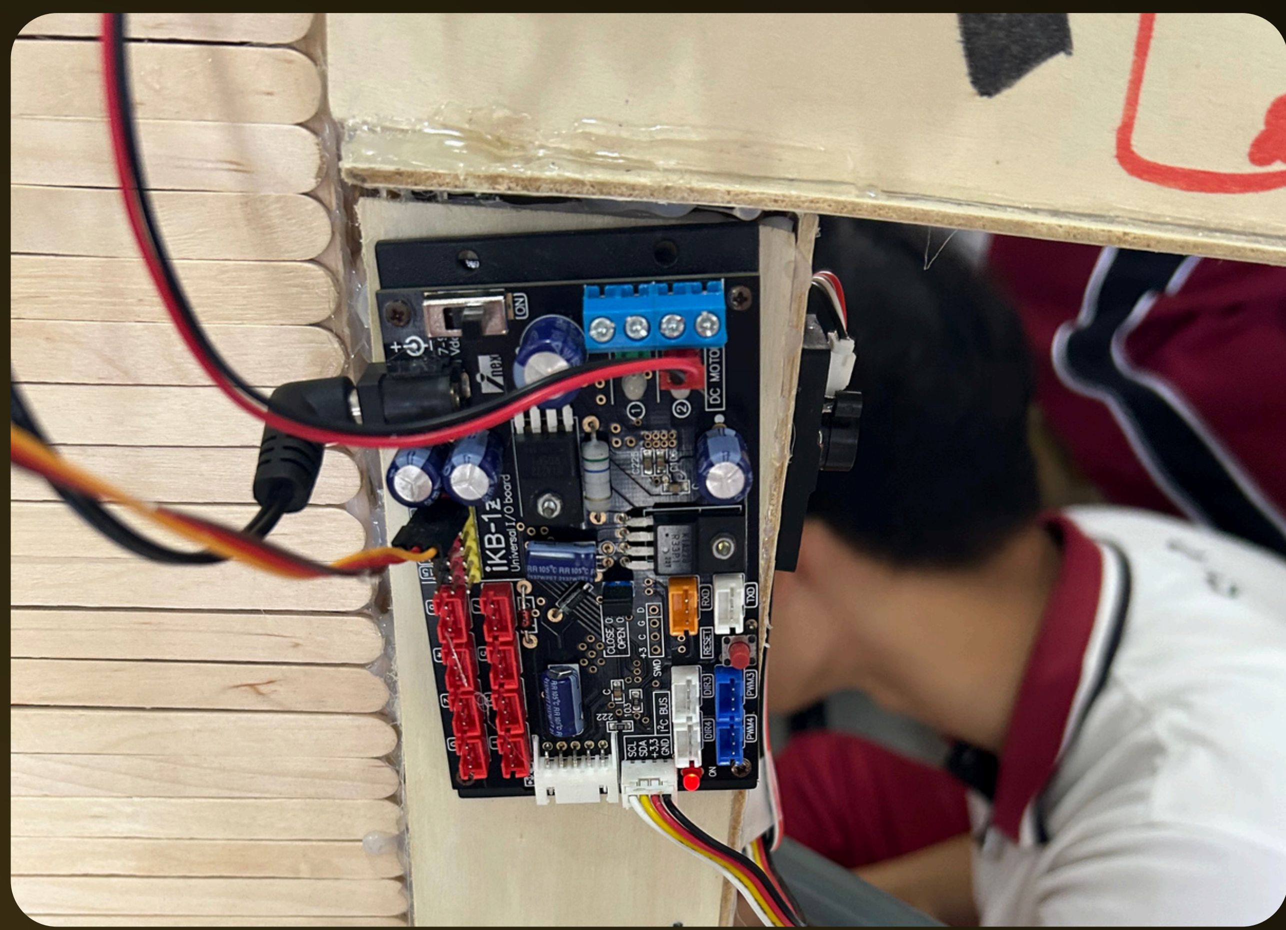
WEEK 10

During Week 10, our main task was to write and debug the initial code for the components of our project. We started by reviewing the system requirements andidentifying the code needed to control the sensors. The ESP32 microcontroller served as the brain of our system, and we programmed it to manage data from ultrasonic sensor motor, motor, servo, infrared sensor, and neo pixel.

Each component required specific code to function properly. For example, the servo motor was programmed to open the food storage, while the motor needed precise control to pull rope up. We used Arduino IDE to upload the code and debug it step by step. Some errors occured during testing, such as incorrect sensor readings and delays in the ultrasonic response. We fixed these issues by adjusting the code, ensuring the right libraries were included, and checking our wiring connecting.

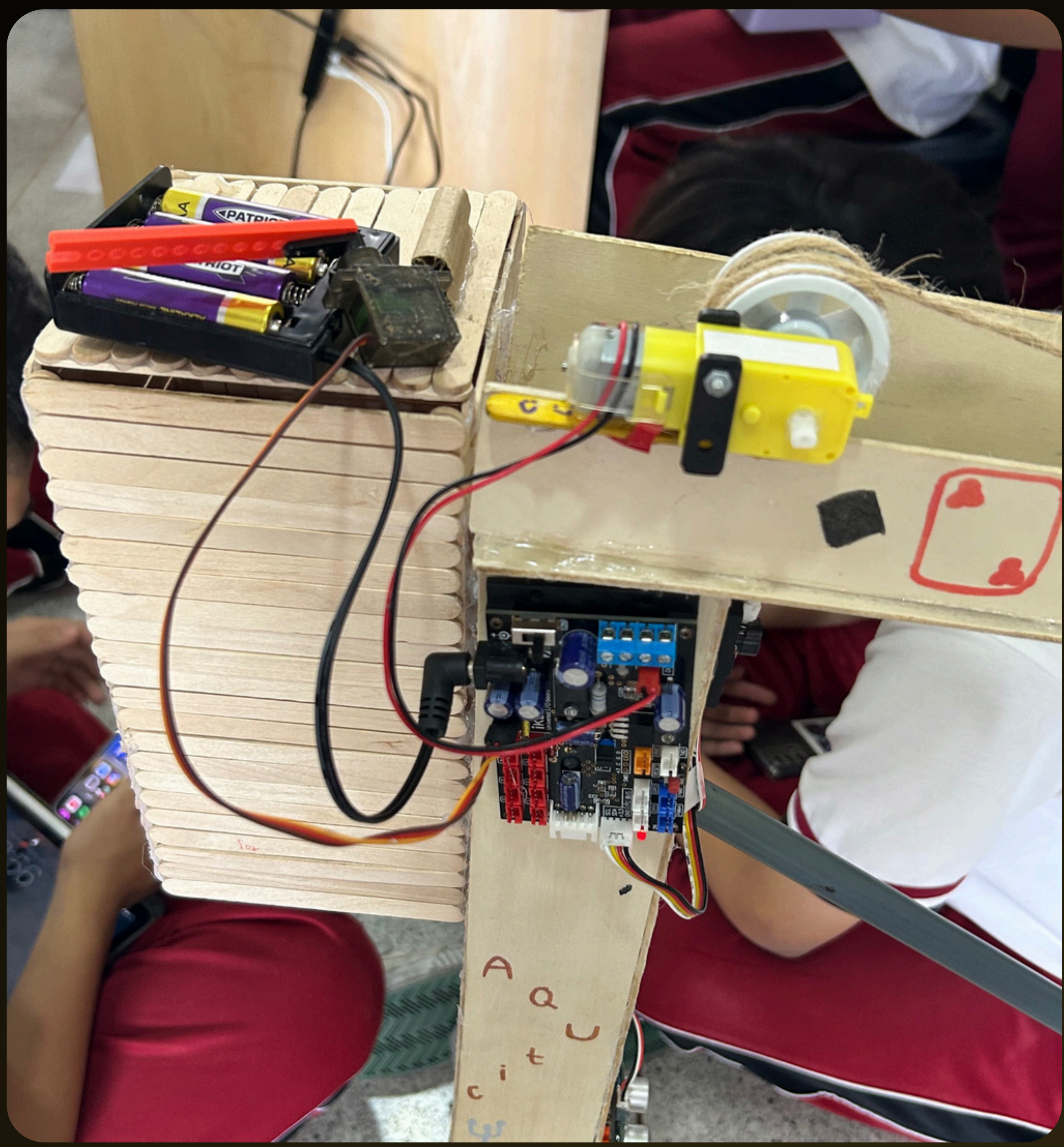
By the end of the week, we had successfully uploaded working code for each component and tested them individually to confirm they were functioning as expected. The next step was to combine these components into a complete system during Week 11

WEEK 11



In Week 11, we focused on integrating all the components weprogrammed in Week 10 into a fully working system. The ESP32 microcontroller acted as the hub, connecting the sensors and actuators to ensure the system could function as a unit.

One of the main challenges wa faced during integration was managing the power supply. Some components, like the motor, required more power than others. To fix this, we use more battery to balance the load and ensure that all components received enough power.

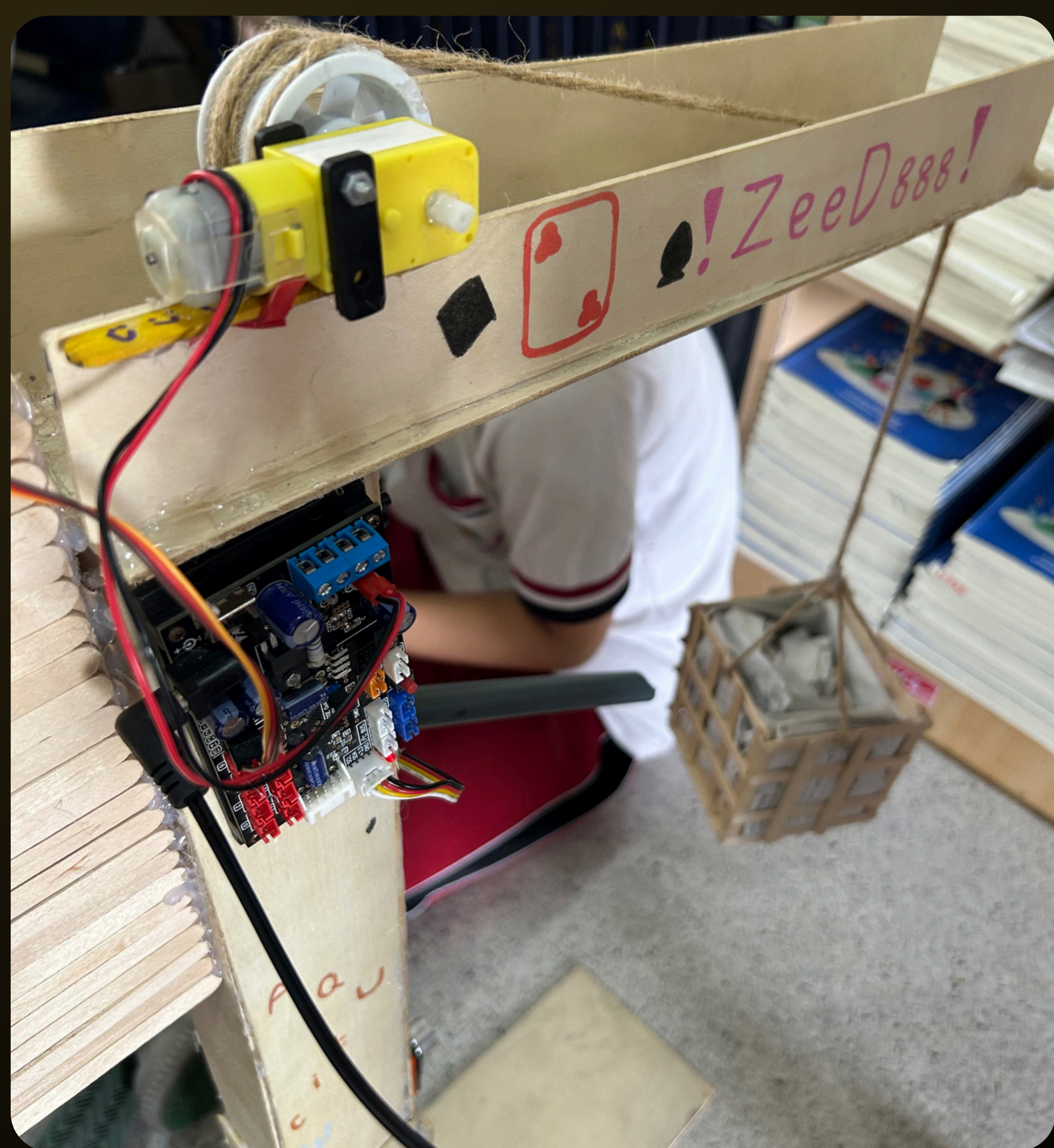


Advanced Testing and Troubleshooting

In Week 13, we focused on improving our prototype to enhance its structure, stability, and usability. We reorganized the wiring on the breadboard to create a cleaner layout and reduce the risk of tangled wires. Additionally, we adjusted the positioning of the sensors to improve accuracy and efficiency. For example, we repositioned the ultrasonic sensor and considered adding an ultrasonic sensor to the system. We also reinforced the prototype structure to ensure stability during operation. Every component was securely installed to provide clear outputs, and in the future, we may further organize the wiring to minimize the risk of disconnections. These improvements made the prototype more user-friendly and reliable. After these refinements, we tested the updated system again. The results showed greater stability, faster response times, and more accurate readings across all components.

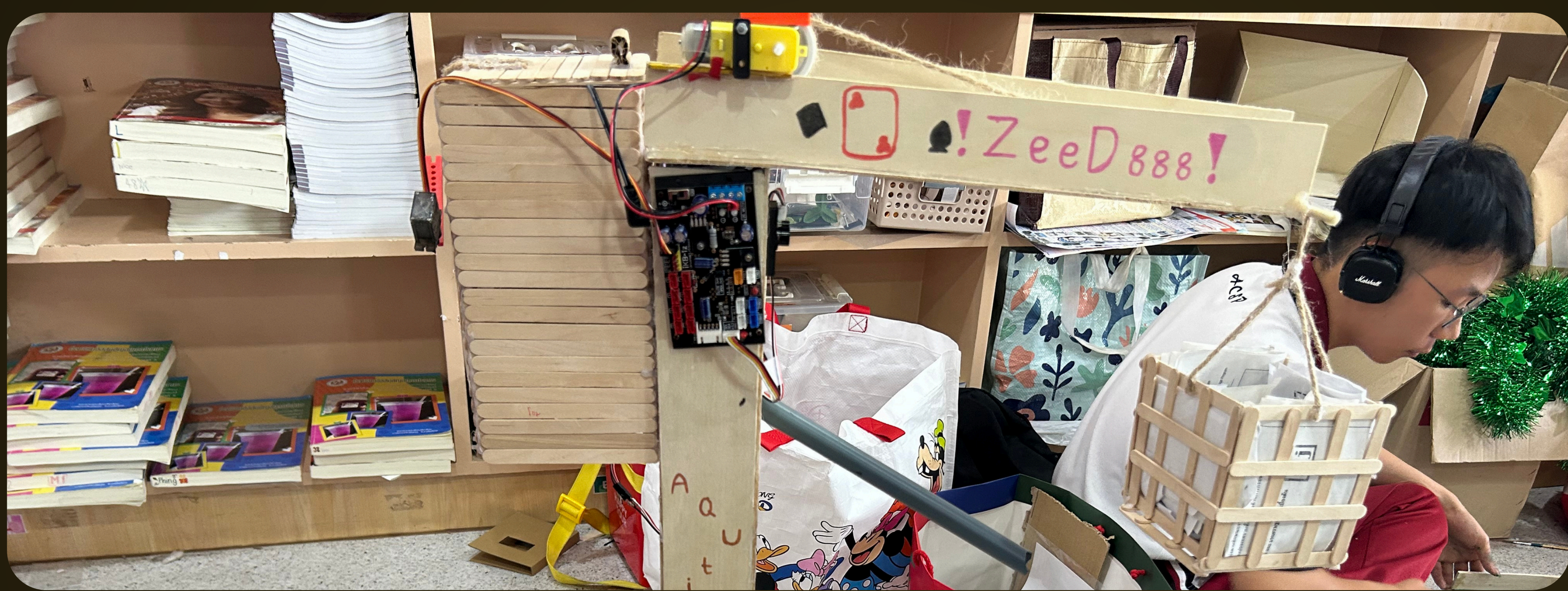
Prototype Refinement and Opitmization

In Week 12, we conducted advanced testing to ensure that our integrated system functioned correctly under different conditions. We tested each sensor and actuator to verify their consistency. The ultrasonic sensor was tested by detecting basket in front of sensor to ensure accurate detection that basket was pull up. One of the challenges we encountered was inconsistent sensor data, especially when the power supply fluctuated. We resolved this issue by securing the wiring connections and using a more stable external power source. Additionally, we noticed delays in the servo motor response when handling larger loads. To fix this, we optimized the code to enhance the motor efficiency and reduce response time. By the end of the week, our system became more stable and reliable, ready for further improvements in Week 13.



Conclusion

The progress made in Phase 1 and Phase 2 has significantly advanced our project, from planning and initial prototyping to system integration and testing. Although we encountered several issues during the trials, such as sensors failing to detect consistently, operational instability, and unresponsive buttons, we have successfully resolved these problems. The system is now more stable, with the integration of ultrasonic technology to enhance view functionality, and our motor sensor is now performing very well in moving.



Power Optimization

In the future, we plan to incorporate solar panels to replace the use of batteries or electricity, which will increase energy efficiency and reduce pollution.

User Interface Development

We will develop an online application that can send alerts through the app in case of mistake.

Real-World Testing

In the future, we will conduct trial in real-world locations, such as on fish farm, to ensure the system performs at its best before actual deployment.

Error Handling and Alerts

In the future, we will continuously make improvements and fix errors by utilizing AI for calculations and notifications. We will also develop an app to consistently send alerts to owner.