BALL CATCHERS

INTELLIGENT ROLLING BALL CAPTURE ROBOT

EEE489-Senior Design Project
Instructor: Dr. Kostas Tsakalis

PROJECT SUMMARY

Our project, Ball Catchers, is an autonomous robotic system designed to detect, align, and capture a rolling ball in real time. Using a USB Camera for ball detection, TCP Wireless Communication, and an ESP32 Microcontroller to control the Robot.

KEY FEATURES

- Real-time ball detection using OpenCV
- TCP-based wireless communication between Computer & Arduino
- Autonomous navigation with two-wheel drive
- On-screen visual feedback

RESULTS & OUTCOMES

- Accurate Color Detection in Controlled Environment
- Smooth PID Control to move and capture ball
- Seamless Wireless Communication

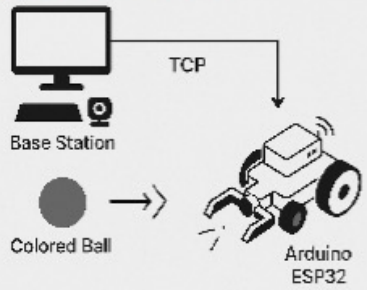
FUTURE WORK

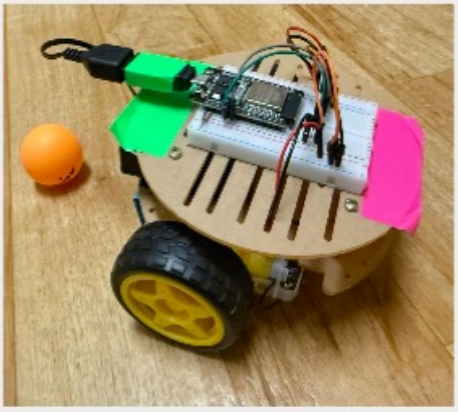
- Enhancing outdoor performance
- Improving object detection in varying environments.
- Expanding wireless communication
- Adding modules to increase robot autonomy

Acknowledgements

We thank "Dr. Kostas Tsakalis and the EEE Department at Arizona State University.

GENERAL SETUP





BUDGET

Items	Cost
AA Batteries	$6
Battery Case	$6
ESP32 Wroom (3 Pcs)	$17
Motor & Wheels	$10
Wheel Base	$15
USB Camera	$20
Stickers (600 Pcs)	$15
NPN Transistors (250 Pcs)	$9
USB A->Micro Adapter (3 Pcs)	$8
Total	**$106**

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