Selected Component	Alternative	Comparison	Reason for Preference
ESP-WROOM-32 (Microcontroller)	Arduino Uno / Raspberry Pi Pico	ESP32 is faster (240MHz vs 16MHz for Arduino), built-in Wi-Fi & Bluetooth, lower power consumption.	Ideal for smart robots (wireless control + vision processing + cost-effective).
GM25 370 Motor (Driving Motor)	N20 Gear Motor / DC 775	Medium size, good torque, suitable speed for small robots, lower power consumption than 775.	Balanced torque, size, and price; compatible with LEGO wheels.
MG996R Servo	High-torque Servo / Digital Servo Motor	MG996R servo is compatible with Arduino and robotics kits, metal gears, stable performance.	Durable, strong torque + easy mounting on standard servo horns.
L298N Motor Driver	L293D / BTS7960	L298N handles up to 2A, easy to use with ready libraries, cheap and widely available.	Enough for GM25 370 motors, simple wiring, no extra complexity.
Pixy2 Camera (Object Tracking)	OpenMV Cam / Arducam	Pixy2 has built-in color & shape tracking in hardware (no external processing needed), faster response.	Reduces ESP32 load, perfect for small robotics projects.
Ultrasonic HC-SR04	VL53L0X (ToF Distance Sensor)	Ultrasonic has longer range, easier use, and more available than VL53L0X.	Affordable, easy to integrate, and best suited for obstacle detection in mobile robots.
MPU6050 (Gyro + Accelerometer)	BNO055 / MPU9250	MPU6050 is cheaper, widely available, sufficient for balancing and orientation projects.	Low cost and provides enough data for robot navigation.

4 × Weeemake Wheels Ø65	Weeemake Robot Wheels / Rubber Wheels	Weeemake wheels are compatible with standard DC motors, lightweight, good surface grip.	Excellent traction + easy mounting without adapters.
LEGO Technic Pieces	3D Printed Parts / Metal Frames	LEGO Technic is flexible, precise in dimensions, easy to assemble/disassemble, safe to use.	Much faster and simpler to prototype and modify compared to custom-made parts.