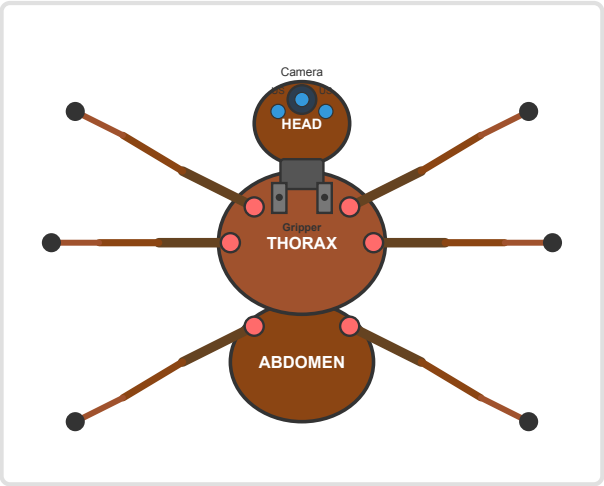
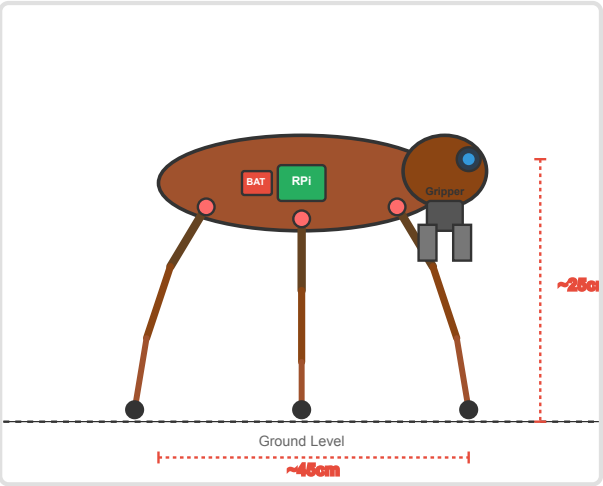
# 🤖 Ant Robot Visual Design 🐜

SEN 4821 Robotics Project - Autonomous Waste Collection Robot

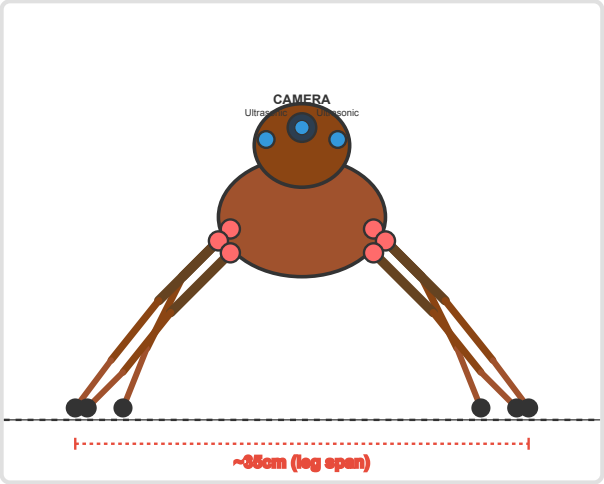
## 📐 TOP VIEW



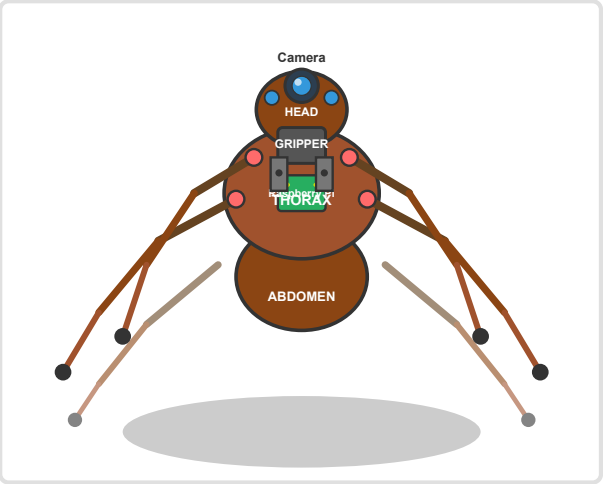

## 📏 SIDE VIEW




## 👁️ FRONT VIEW




## 🎨 3D PERSPECTIVE VIEW




## 🎨 Component Legend

**Body (Thorax):** Main chassis with

**Head & Abdomen:** Camera mount &

**Body (Thorax):** Main chassis with electronics

**Head & Abdomen:** Camera mount & battery compartment

**Coxa (Hip Joint):** 60mm, connects body to leg

**Femur (Knee):** 80mm, middle leg segment

**Tibia (Ankle):** 100mm, connects to foot

**Foot Pads:** Rubber for traction

**Servo Joints:** MG996R motors (18 total)

**Camera:** Raspberry Pi Camera V2 (8MP)

**Ultrasonic Sensors:** HC-SR04 (obstacle detection)

**Gripper:** 2-DOF parallel jaw (50-150mm range)

**Raspberry Pi 4:** Main controller (inside thorax)

**LiPo Battery:** 11.1V 5000mAh (inside abdomen)

## 📊 Robot Specifications

| | |
|---|---|
| **Overall Length**<br>45 cm | **Overall Width (leg span)**<br>35 cm |
| **Overall Height**<br>25 cm | **Ground Clearance**<br>8 cm |
| **Total Weight**<br>2.5 - 3.5 kg | **Number of Legs**<br>6 (hexapod) |
| **Degrees of Freedom**<br>18 DOF | **Servo Motors**<br>21 total (18 legs + 3 extras) |
| **Walking Speed**<br>0.1 - 0.3 m/s | **Payload Capacity**<br>0.5 - 1.0 kg |
| **Battery Life**<br>45 - 60 minutes | **Detection Range**<br>0.5 - 3 meters |

**Gripper Range**
50 - 150 mm

**Camera Resolution**
8 MP (1080p video)

**AI Accuracy**
>85% (target)

**Power Supply**
11.1V LiPo 5000mAh

## SEN 4821 Robotics Project

Autonomous Waste Collection Ant Robot - Visual Design Reference

This robot uses NO WHEELS - only 6 walking legs for locomotion

⚠️ **IMPORTANT: Gripper is mounted at the FRONT (below camera) for better waste detection and pickup**

✅ Camera sees waste → Robot approaches → Gripper picks up → Battery at rear balances weight