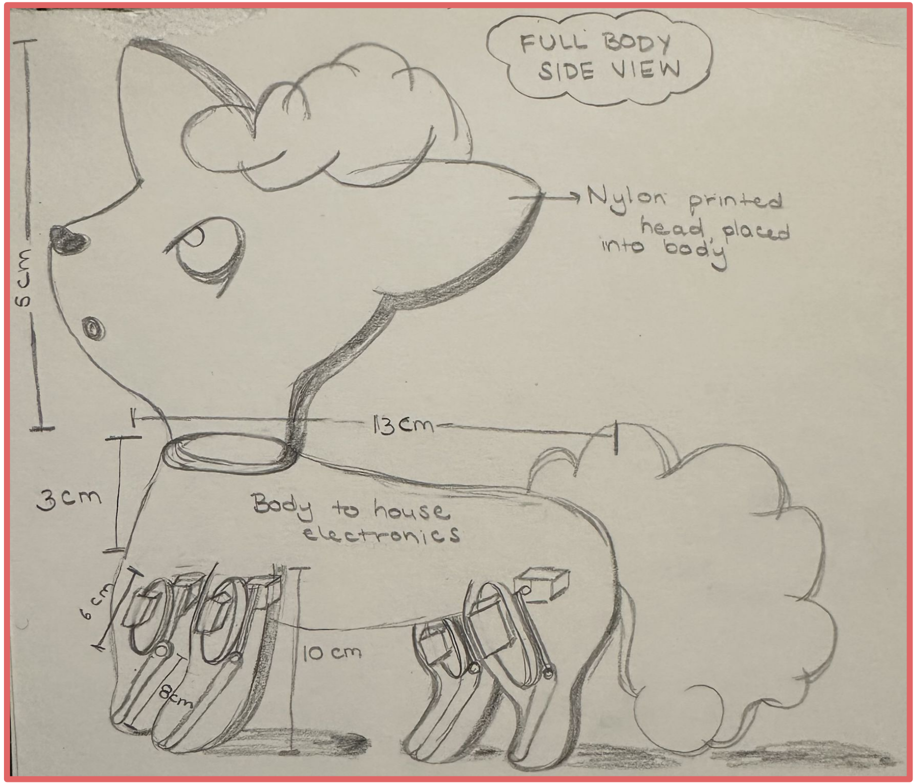
# Robotics Studio MECE 4611

**Spring 2025, Assignment 1**
**Anjali Parande**: arp2222
**Nicolas Alarcon**: na2946
**Submitted**: Jan 25th 5:30 PM
**Grace Hours Gained**: 78.5



# Design 1: Inspiration from Gen AI

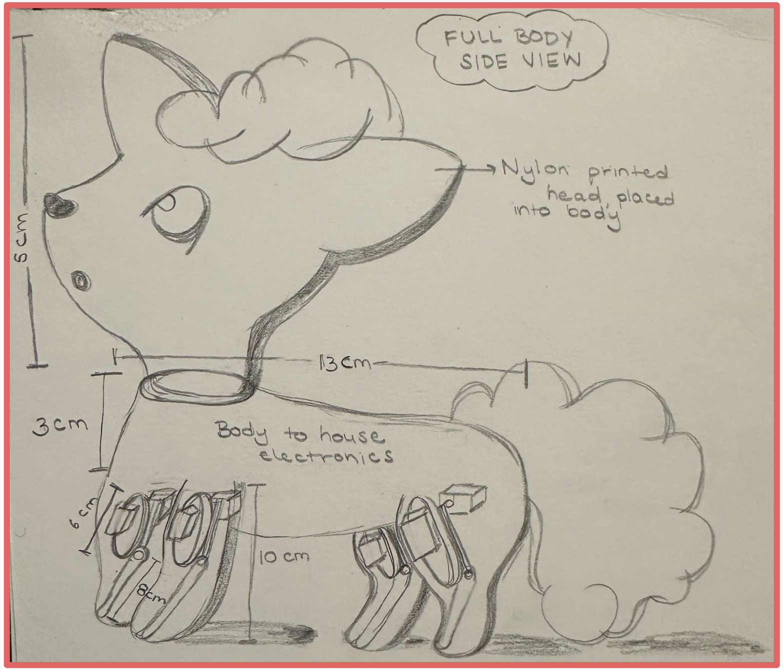
Prompt #1: Render a robot based on the Pokemon Vulpix

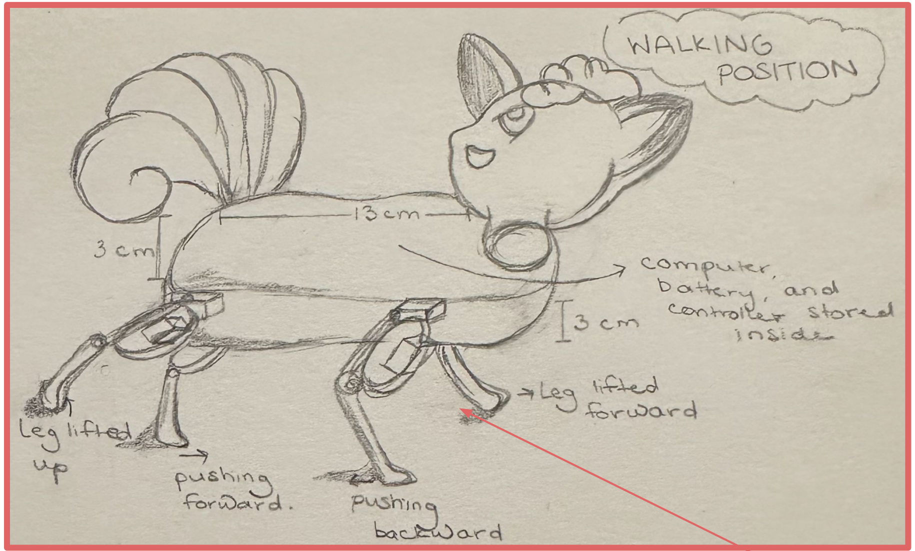
Prompt #2: Render a robot based on the Pokemon Vulpix but with long legs that use indirect legs

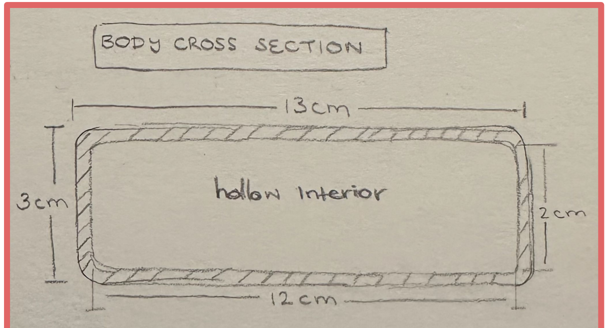
We liked the aesthetics of this photo, but wanted an indirect drive leg design

We liked the leg design but found the rest of the body to be creepy

# Design 1: Quadruped ID Vulpix Bot



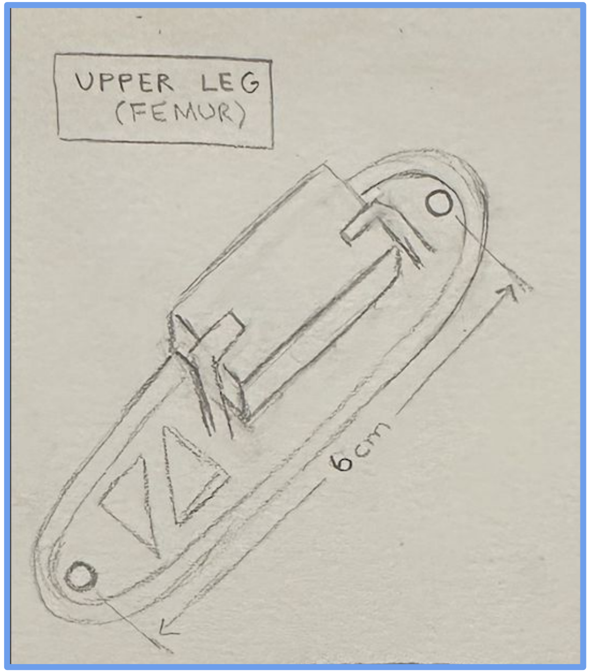



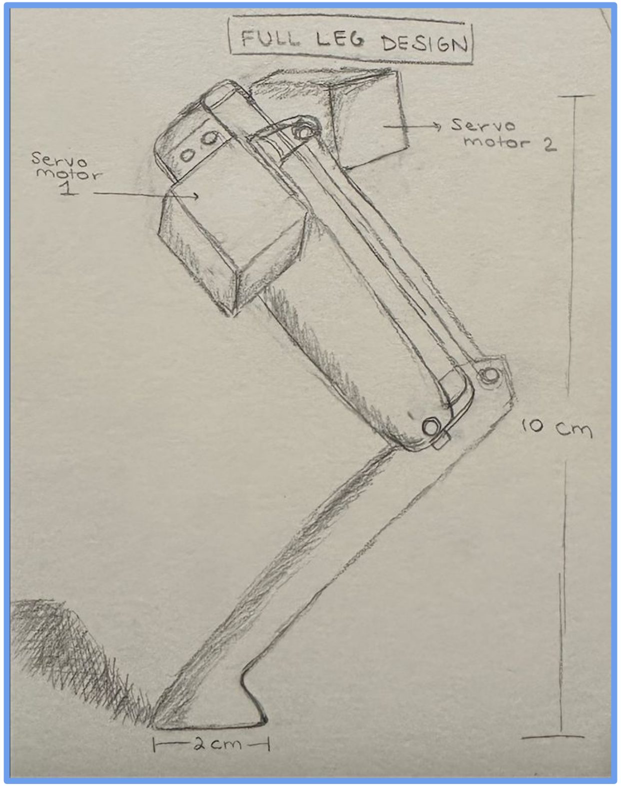



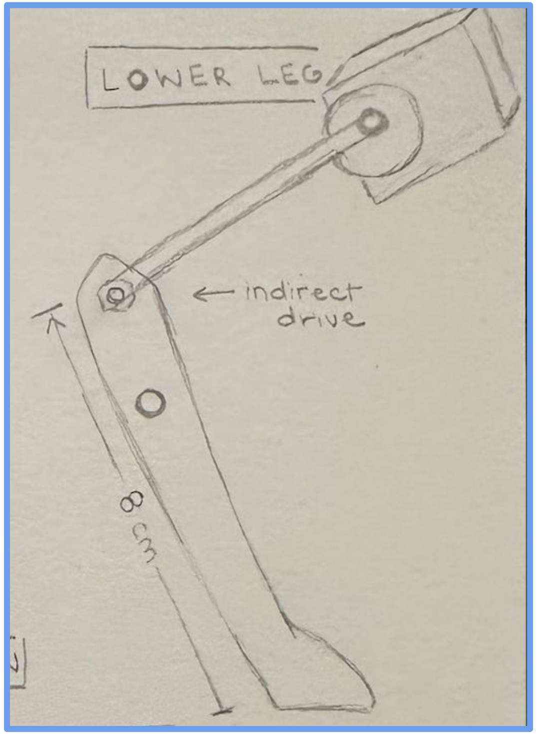

**Stability Analysis:** The legs are quite short, allowing for a CG close to the ground. The heavy electronics are towards the middle of the body, so when the dog walks it won't become off balance suddenly by the components.

**Gait Analysis:** Walks like a dog would walk with two feet on the ground at all times

# Design 1: Leg Design Details



# Design 1: Weight Analysis + Power Analysis

**Vulpix Weight = 1.019kg** = Leg PLA (4) = 218g + Body PLA = 86g + Electronics = 715g

**Estimated Run Time = 1.07 Hrs**

Battery pack (3000 mAh @ 12V) = 36Wh

LX-16A Metal Servos: 1A * 8.4V * 4 servos = 33.6 W

36Wh/33.6W = 1.071h

$V_{leg}$ = 3.14* 1cm*14cm$^2$ = 44cm$^3$

PLA density = 1.24g/cm$^3$

Weight of 4 legs = 44(4)cm$^3$*1.24g/cm$^3$ = 218g

$V_o$ = 13cm*3cm*3cm = 117cm$^3$

$V_i$ = 12cm*2cm*2cm = 48 cm$^3$

Total Volume = 117 - 48 = 69 cm$^3$

Weight of Body = 69cm$^3$*1.24g/cm$^3$ = 86g

Raspberry Pi= 50g

Battery Pack:= 190g

Voltage regulator: 9g

Servo controller (assumption): 50g

Servos: 52g each * 8 motors = 416g

# Design 1: Inspiration from Gen AI

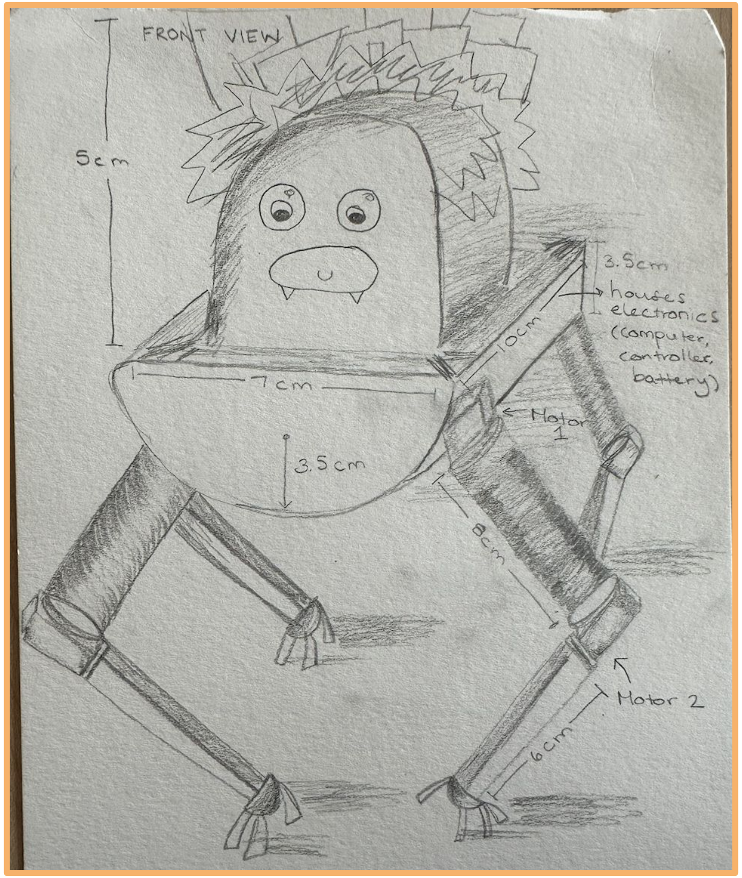
Prompt #1: Create a rendering of a robot that looks like howls moving castle but with a lion

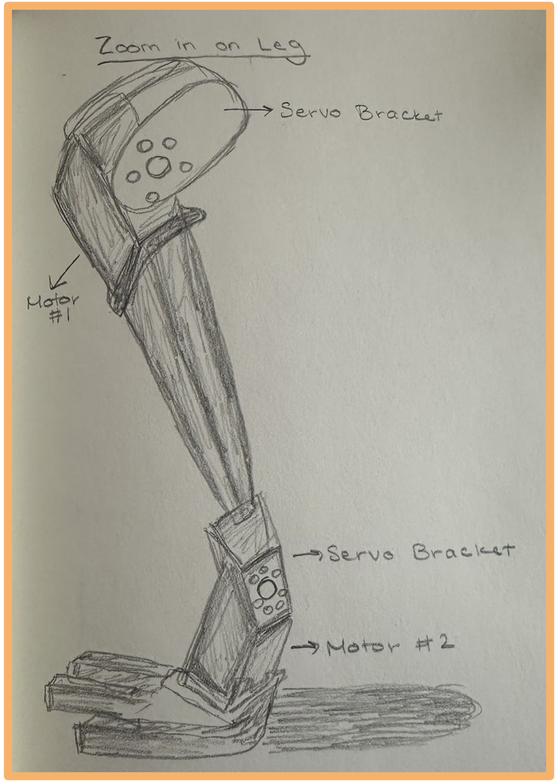
Prompt #2: Create a rendering of a robot that looks like howls moving castle but with a house on top of the robot legs that are quite spindly. and have the face be that of a lion

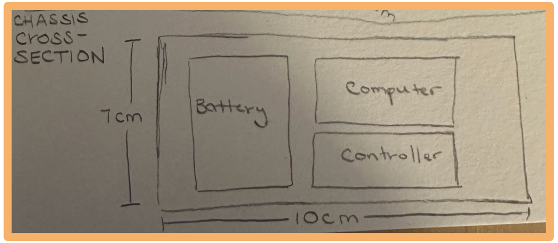
We didn't like this at all.

WE THOUGHT THIS WAS SICK!!

# Design 3: Quadruped DD Roaree's Moving Shack



# Design 2: Weight Analysis + Power Analysis

**Moving Castle Weight = 1.290kg** = Leg PLA (4) = 218g + Body PLA (minus head attachment) = 356g + Electronics = 715g

$V_{leg}$ = 3.14*1cm*14cm$^2$ = 44cm$^3$

PLA density = 1.24g/cm$^3$

Weight of 4 legs = 44(4)cm$^3$*1.24g/cm$^3$ = 218g

$V_o$ = 10cm*3.14*3.5cm$^2$ = 384.7cm$^3$

$V_i$ = 6cm*8cm*2cm = 96 cm$^3$

Total Volume = 384.7 - 96 = 289 cm$^3$

Weight of Body = 289cm$^3$*1.24g/cm$^3$ = 356

Raspberry Pi= 50g

Battery Pack:= 190g

Voltage regulator: 9g

Servo controller (assumption): 50g

Servos: 52g each * 8 motors = 416g

**Estimated Run Time = 1.07 Hrs**

Battery pack (3000 mAh @ 12V) = 36Wh

LX-16A Metal Servos: 1A * 8.4V * 4 servos = 33.6 W

36Wh/33.6W = 1.071h

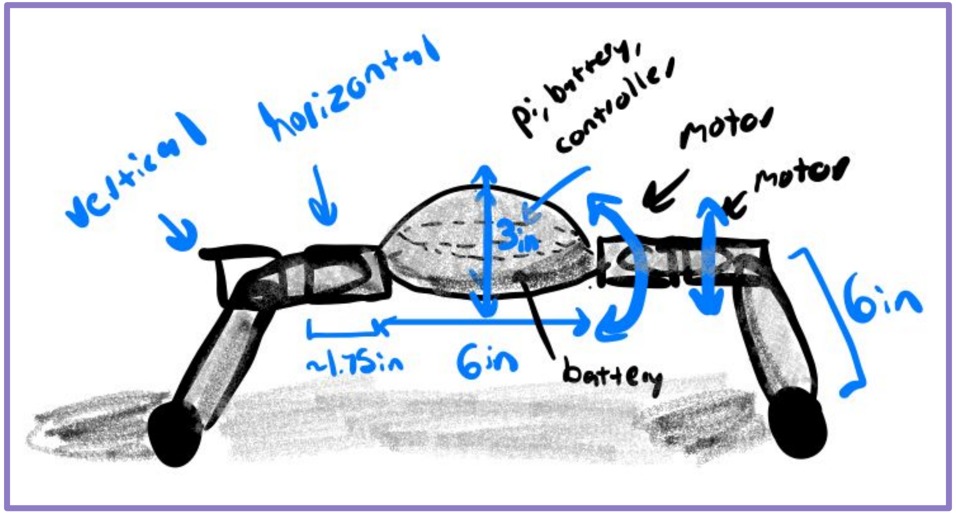
# Design 3: Inspiration from Gen AI

Prompt #1: Create a rendering of a futuristic quadrupedal robot with a spherical metallic body, articulated legs, and a high-tech industrial aesthetic

Prompt #2: Make a rendering of a simple quadruped robot with a spherical body with an articulated dystopian look to it

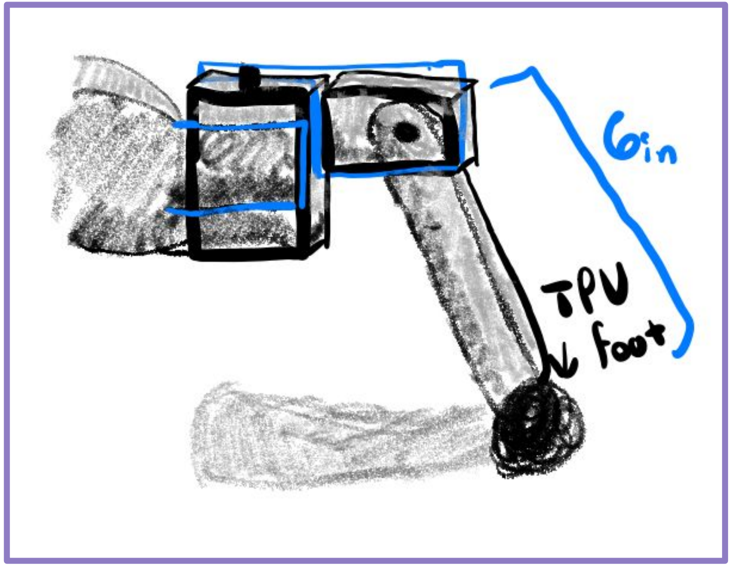
We liked both of these a lot!

# Design 2: Quadruped Omnidroid

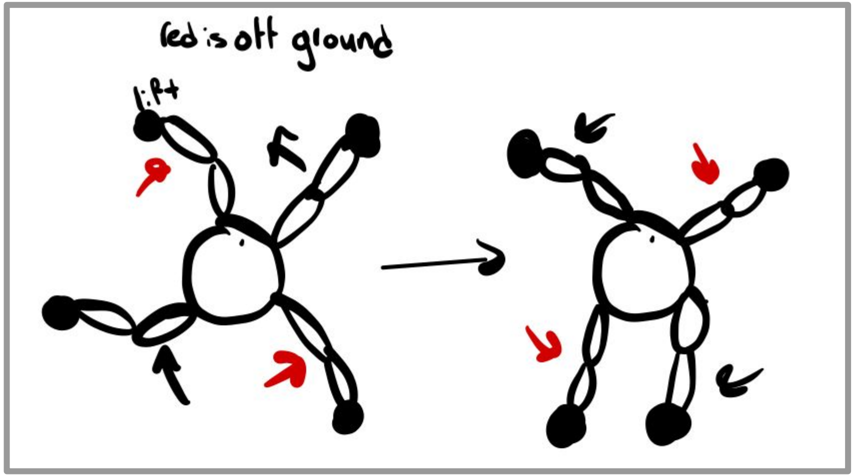



Side View

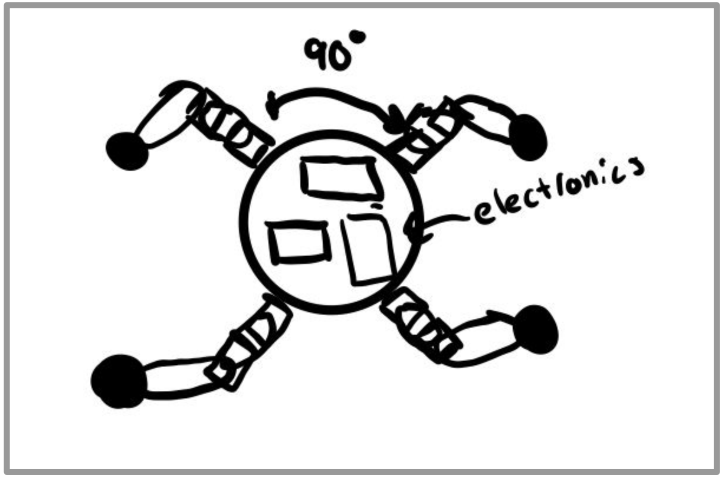
Detailed Leg Drawing



# Design 3: Gait/Stability and Top View




Top View




**Gait Analysis**

**Stability Analysis:**
Center of Mass of the Robot is always supported by the legs at every stage of the gait

# Design 3: Weight Analysis + Power Analysis

**Omnidroid Weight = .92kg** = **Leg PLA (4) = 40.4g** + **Body PLA = 164.8g** + **Electronics = 715g**

**Leg PLA (4) = 40.4g**

TPU Ball 8.58cm^3 * 1.14g/cm^3 = 9.78g

PLA Cylinder .5in diameter x 6in height 19.306cm^3 * 1.24g/cm^3 = 23.9g

Total Weight at 100% infill = 33.68g

Weight * 30% infill = ~10.1g per leg

**Body PLA = 164.8g**

See next slide

**Electronics = 715g**

Raspberry Pi= 50g

Battery Pack:= 190g

Voltage regulator: 9g

Servo controller (assumption): 50g

Servos: 52g each * 8 motors = 416g

**Estimated Run Time = 1.07 Hrs**

Battery pack (3000 mAh @ 12V) = 36Wh

LX-16A Metal Servos: 1A * 8.4V * 4 servos = 33.6 W

36Wh/33.6W = 1.071h

# Weight Analysis

The main body will consist of an approximate hemisphere shell made of PLA, for a conservative estimate assuming .1in thick 100% infill walls. In reality the bottom half may be thicker but at lower infill density. Will be split into a cap and base to access electronics easily and allow for ventilation.

cross section * 2 = 132.9cm^3 * 1.24 g/cm^3 = ~164.8g

# Submission for Feedback on Ed

## Robot Sketch! #8

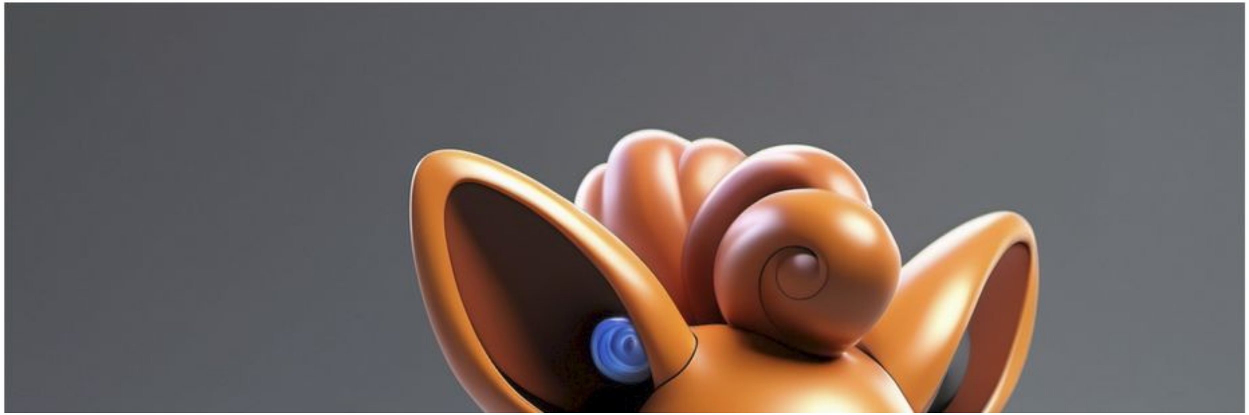
N

Nicolas Alarcon

1 minute ago in General

STAR WATCHING 2 VIEWS

Anjali Parande and I created this sketch of a robot we based off the pokemon Vulpix, included are AI inspiration for the aesthetics and detailed sketches. We would love feedback!



# Rubric and Potential Points

**5 Points Title slide complete**…Slide 1
**5 Points overall aesthetics, layout and formatting of the slides**…All of the slides (each follow the same theme)
**5 Points posting a sketch of your robot on the discussion board at least 24h in advance of the deadline**… Slide 14
5 Points Comment (constructively) on at least three other's postings (show screenshots).
**5 Points showing three robot designs from an AI-generator (e.g. StableDiffusion) along with the prompt** … Slides 2, 6, 9

**5 x3 Points 3D sketch, with key dimensions and labels**…Slides 3, 7, 10
**5 x3 Points shading and shadows**…Slide 3, 4, 7, 10
**5 x2 Points weight estimate, gait and stability analysis…** Slides 3, 5, 11, 12
**5 x3 Points power estimates (including estimated run time)**... Slides 5, 8, 12
**5 x3 Points including Computer, controller, battery labels**…Slides 3, 7, 10
**5 x2 Points showing in multiple poses**…Slides 3, 11
**10 x3 Points showing generative AI assistance**… Slides 2, 5, 9

Total Points: 130

# Sources

Raspberry pi 4 B https://datasheets.raspberrypi.com/rpi4/raspberry-pi-4-mechanical-drawing.pdf

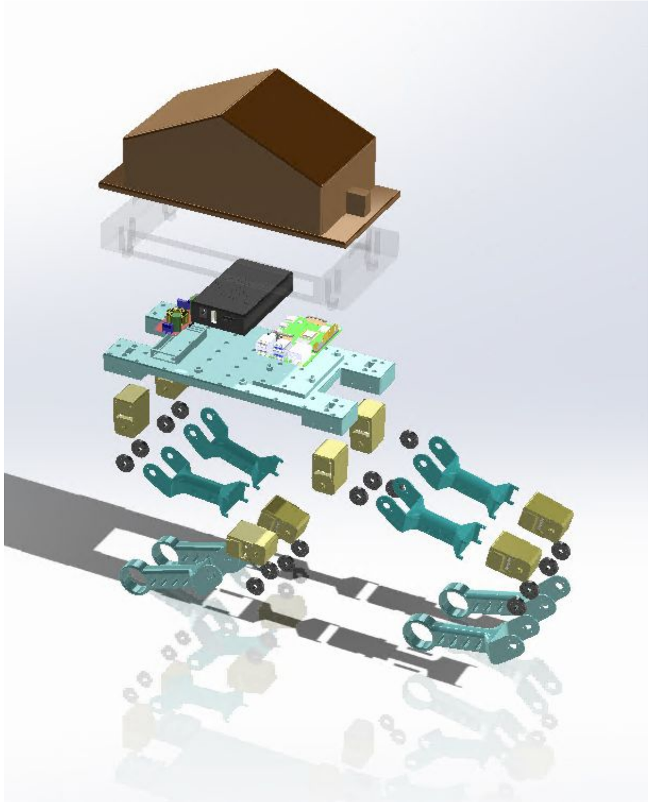
Weights from Lecture 2 Slide 84

Servos and Controller
https://www.amazon.com/LewanSoul-LX-16A-Robotic-Controller-Control/dp/B073XY5NT1

Battery Pack
https://www.amazon.com/TalentCell-Rechargeable-12000mAh-Multi-led-indicator/dp/B00ME3ZH7C

# Robotics Studio MECE 4611

**Spring 2025, Assignment 2**
**Anjali Parande**: arp2222
**Nicolas Alarcon**: na2946
**Submitted**: 2/4/2025, 4:45 PM
**Total Grace Hours Gained**:
78.5 + 6 = 84.5



# The Concept: Roaree’s Moving Shack

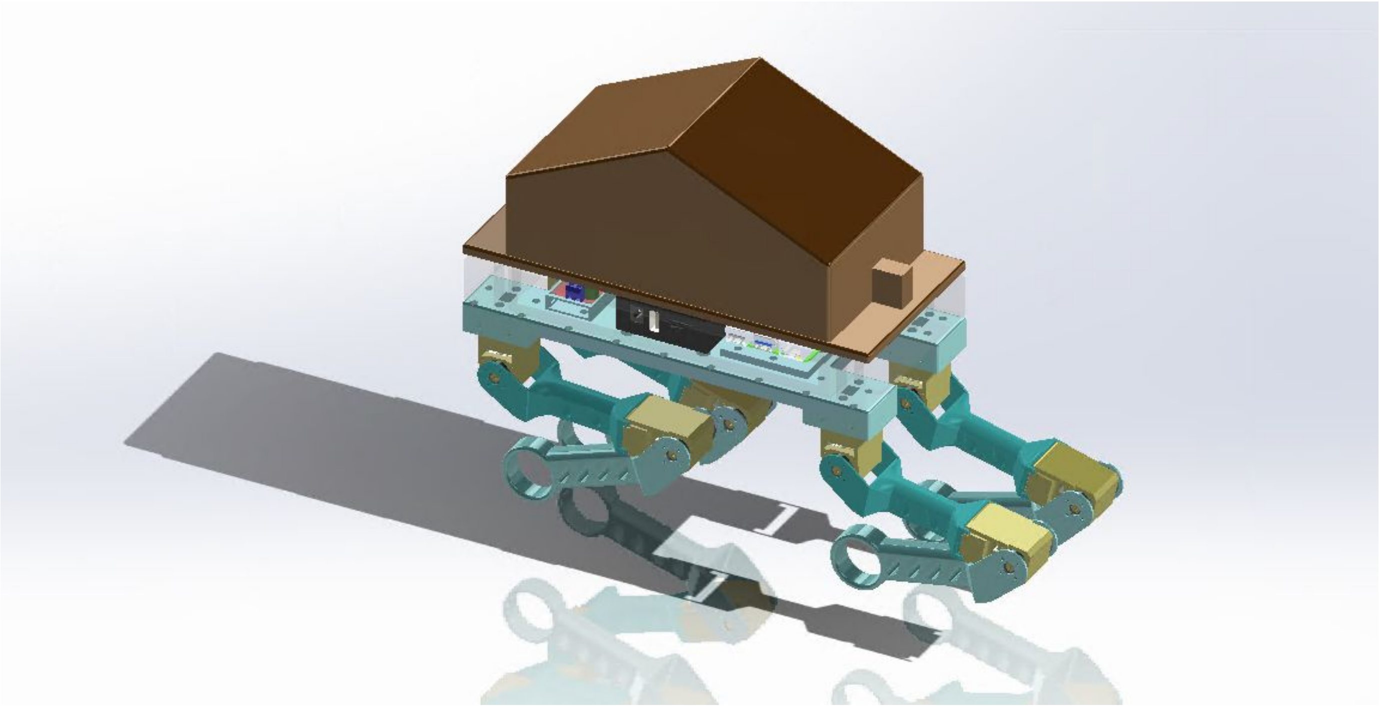
# Context Rendering

Nico

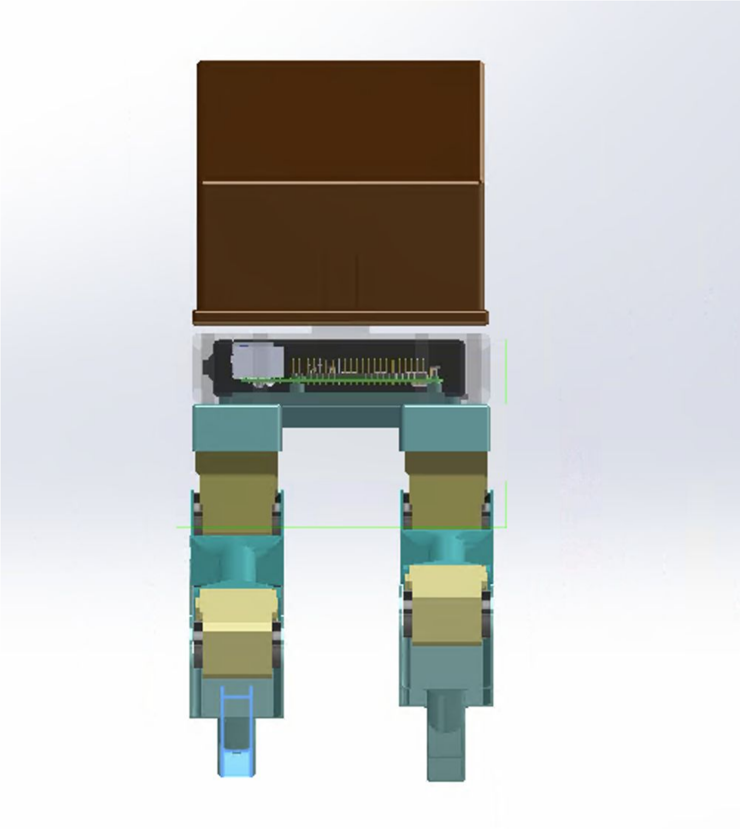
Anjali

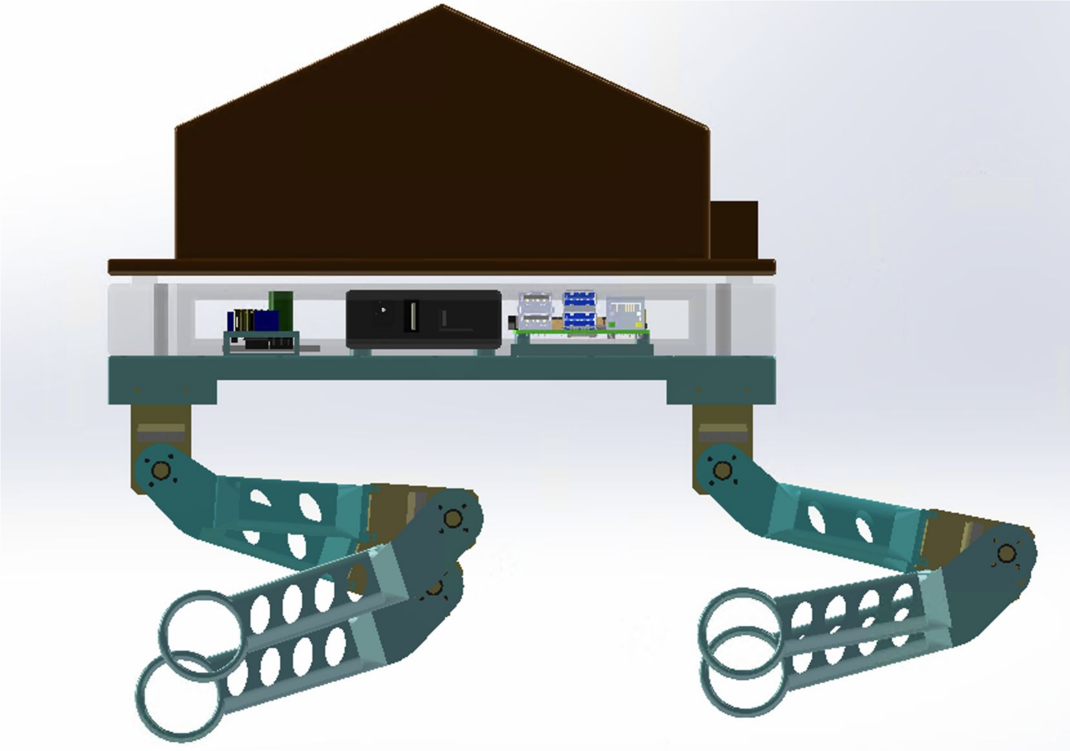
Roaree's
Moving Shack

# Photorealistic Rendering



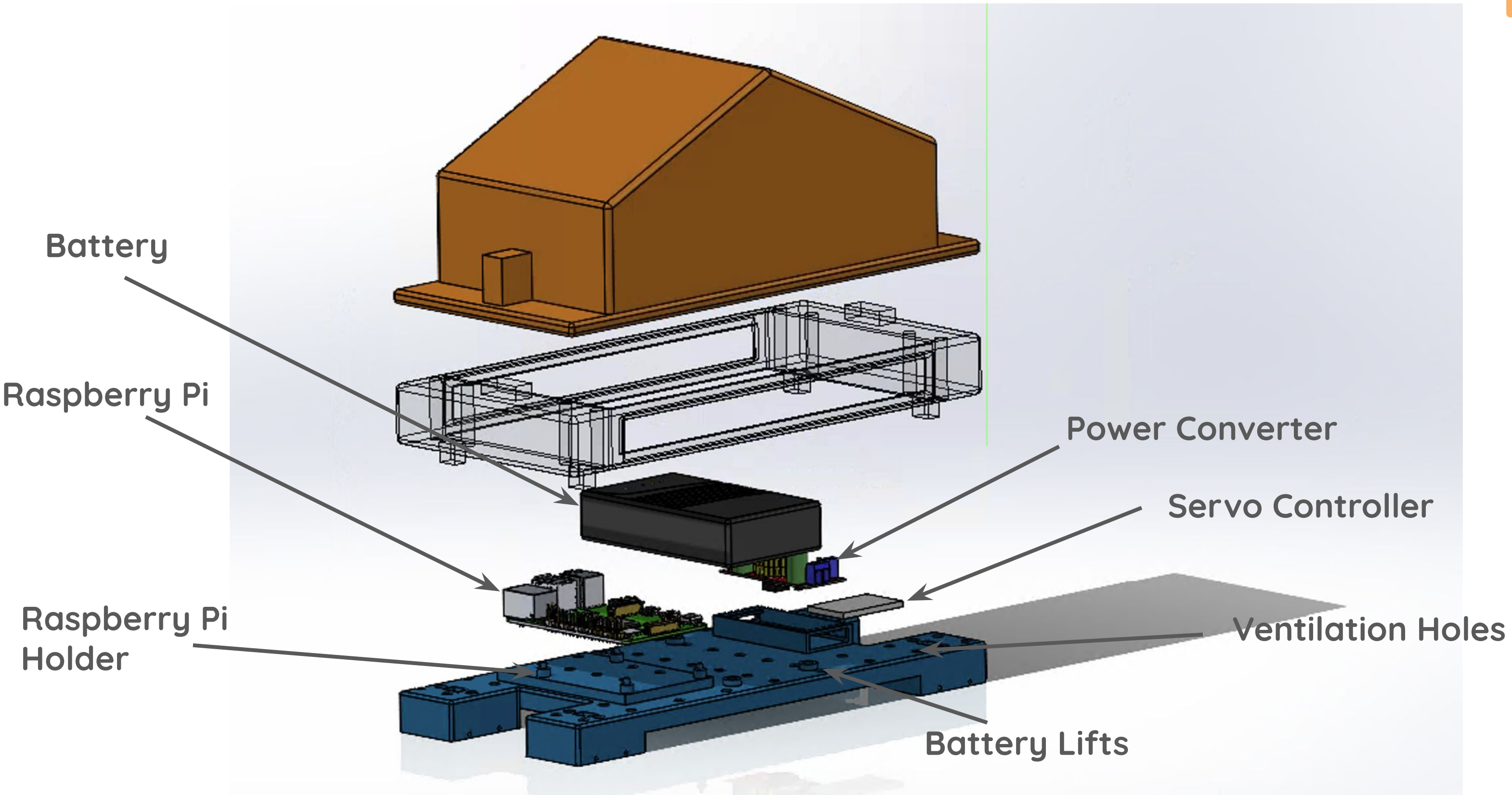
# 3D Rendering – Front and Side View



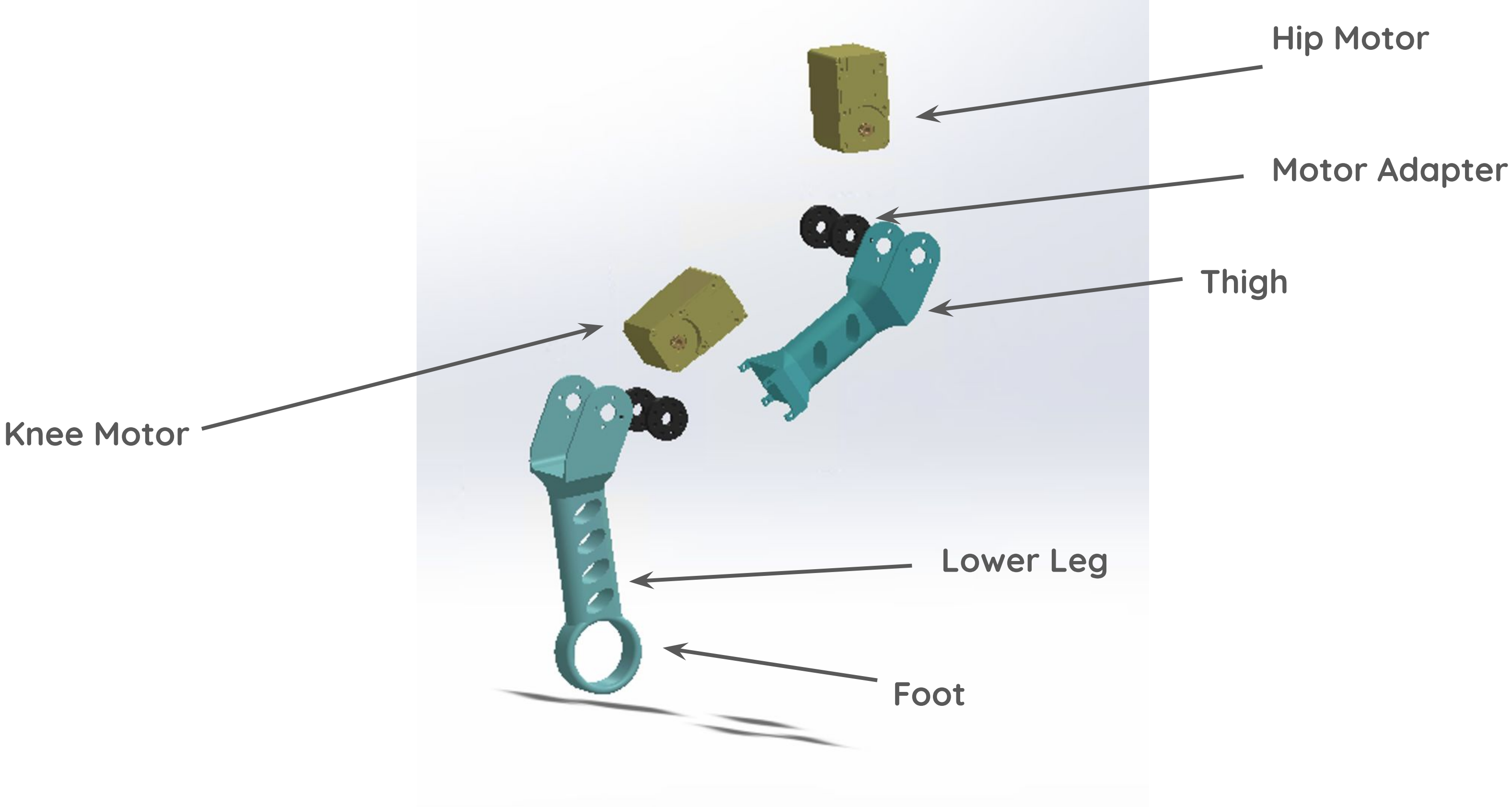


# Further Details

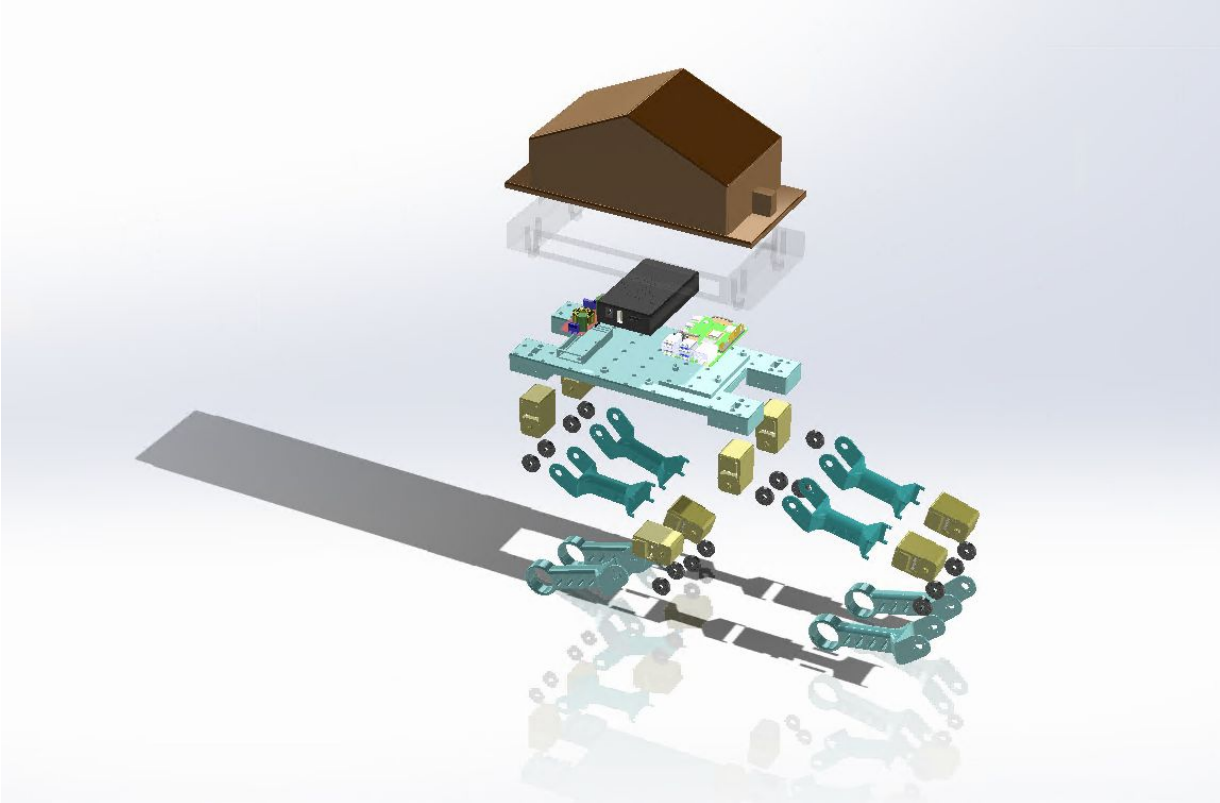
# Exploded View – Body



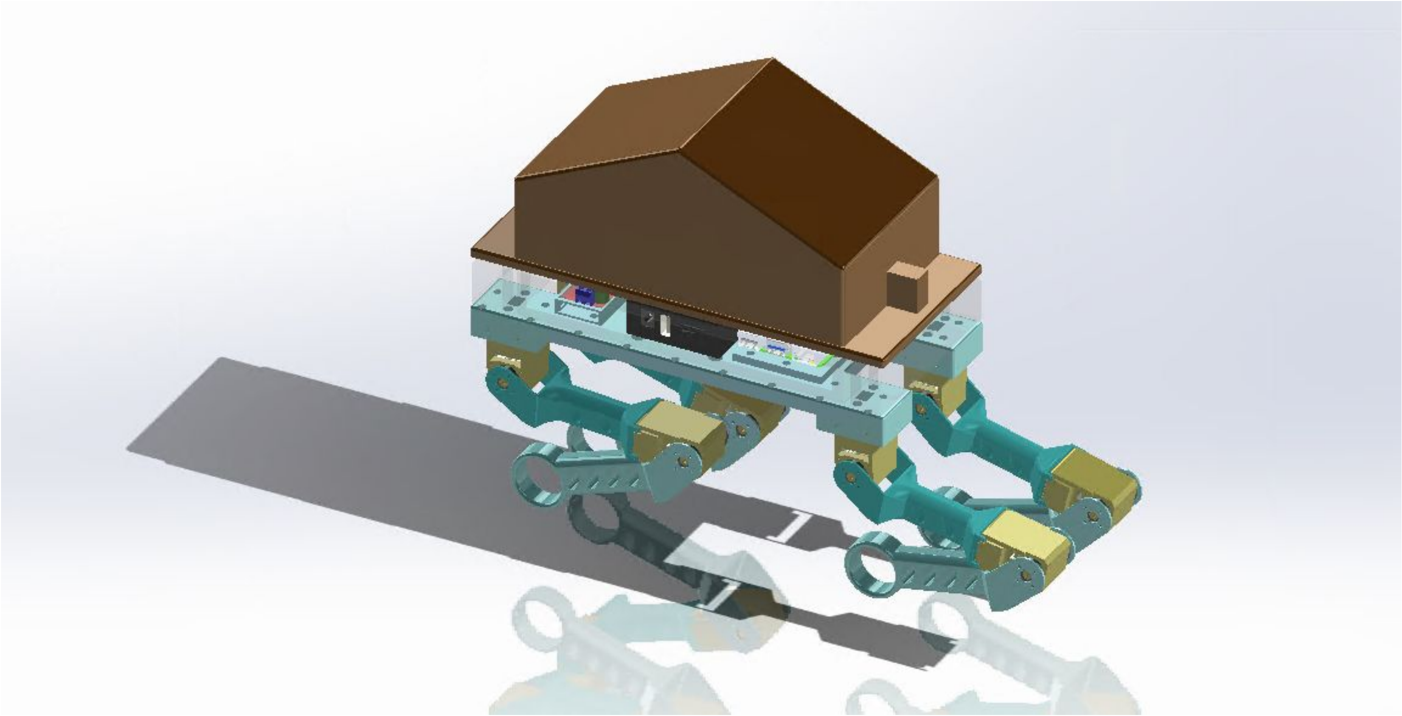
# Exploded View – Leg



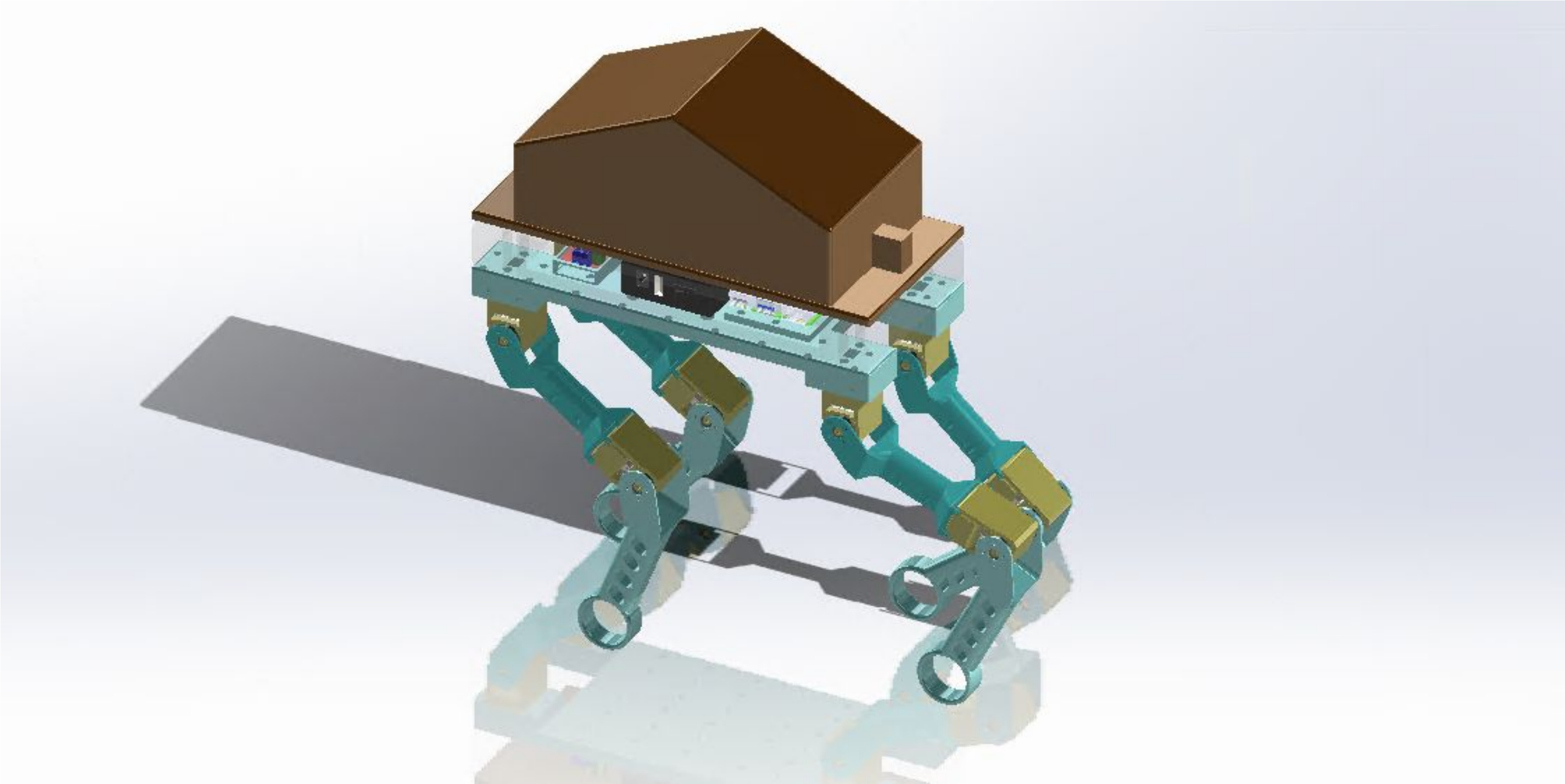
# Exploded View – Roaree!



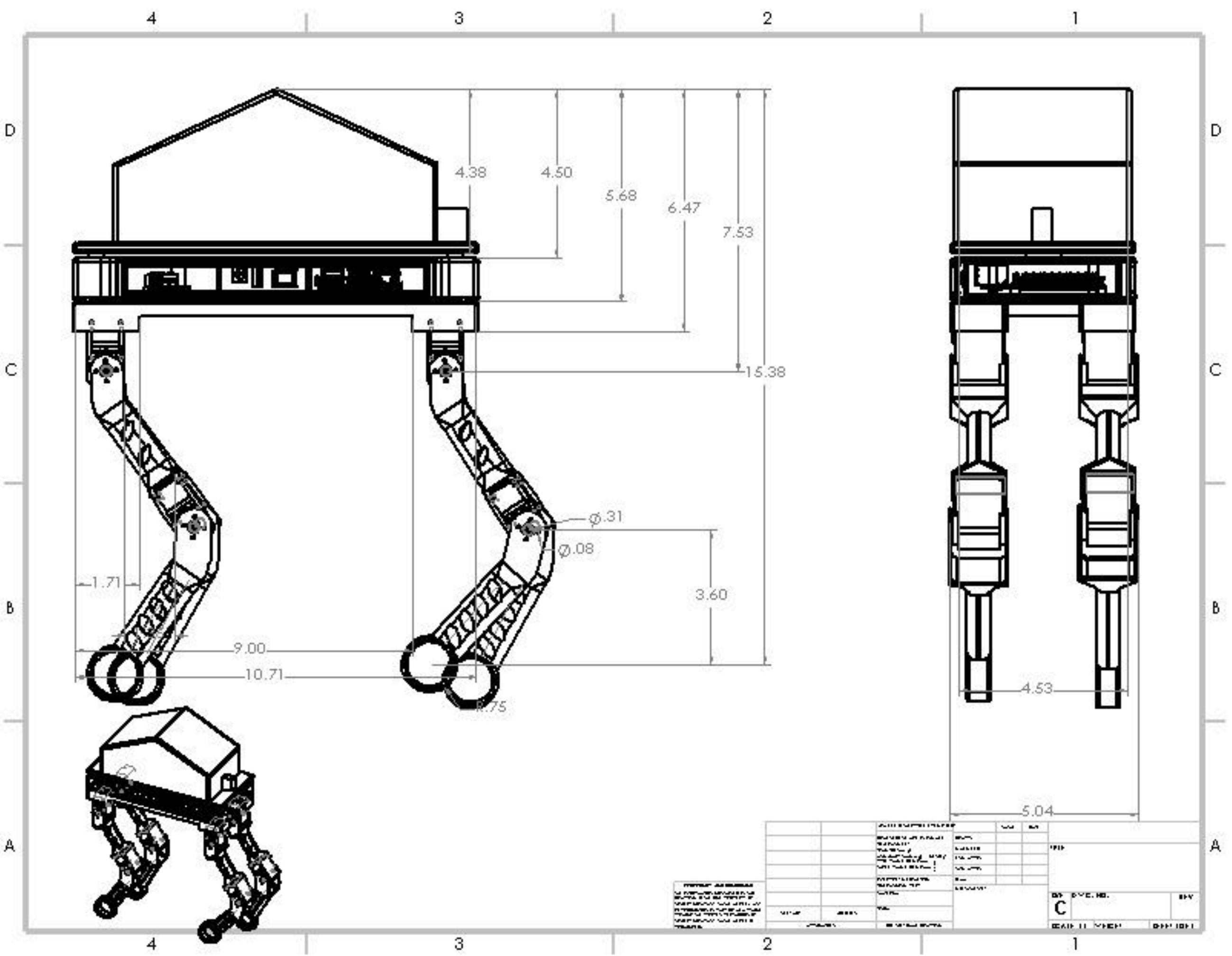
# Isometric View – Sitting!



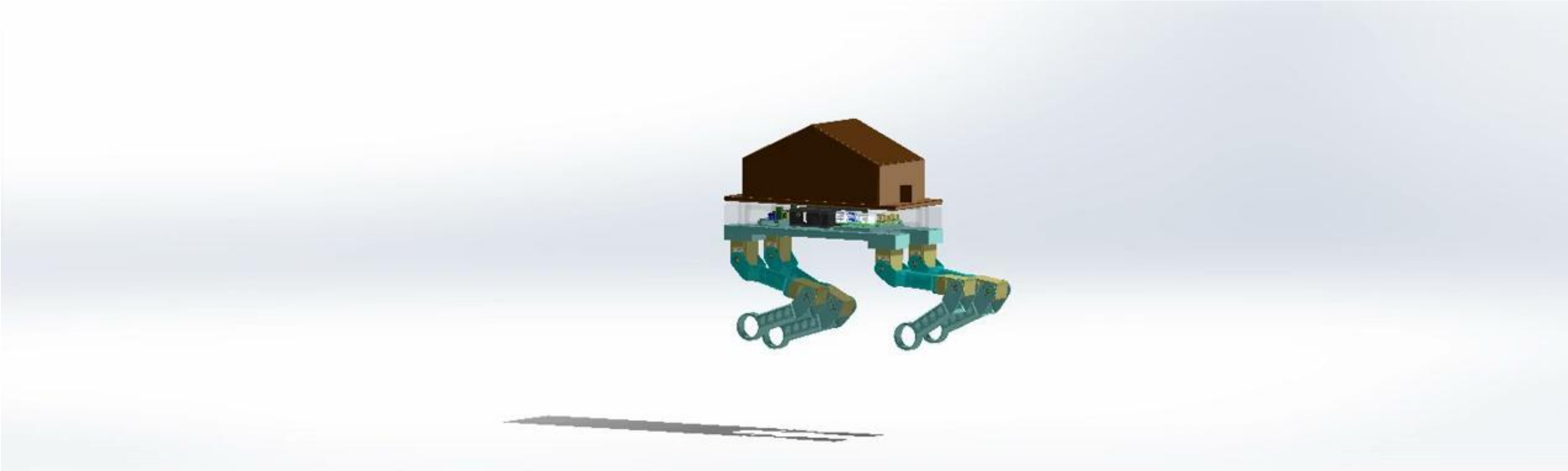
# Isometric View – Standing High!



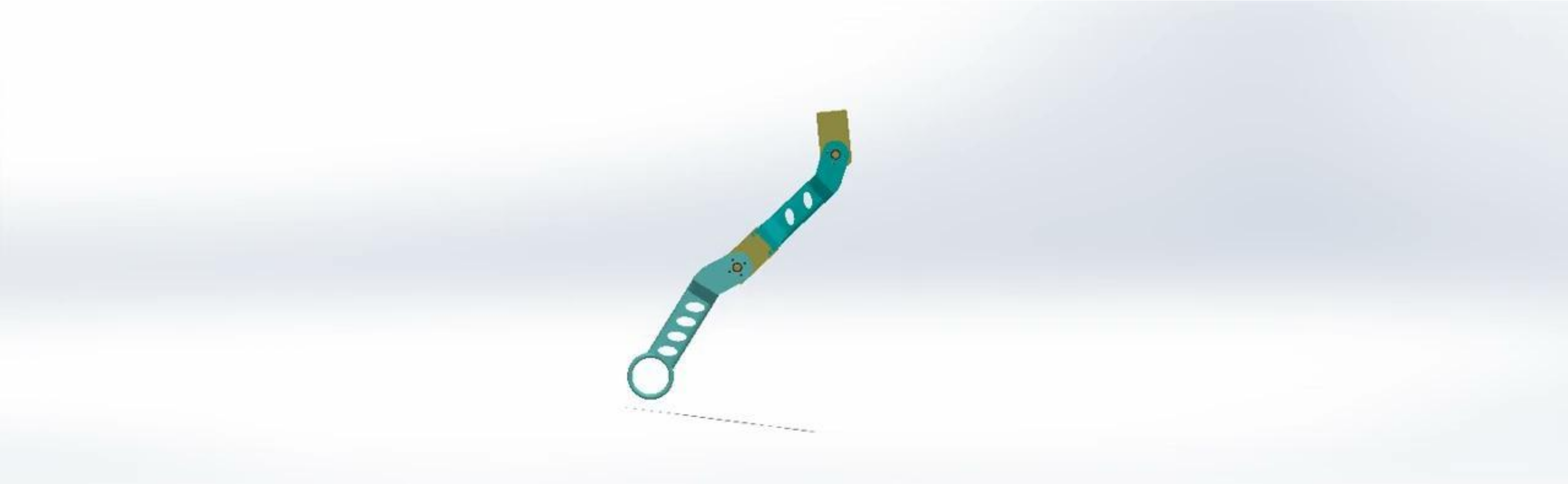
# Key Dimensions



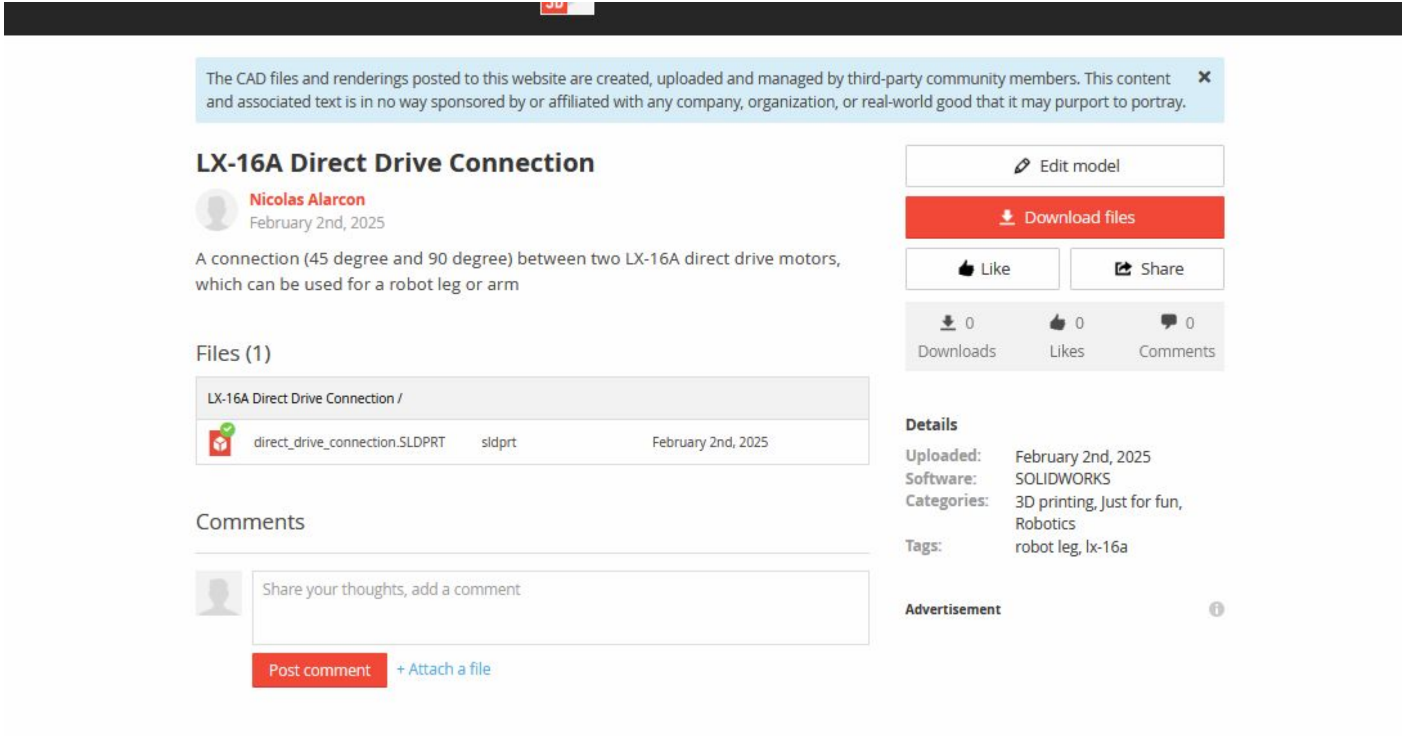
# Animations – Sitting to Standing with One Leg Posed to Step : [LINK TO VIEW](#)



# Animations – Leg Moving: LINK TO VIEW



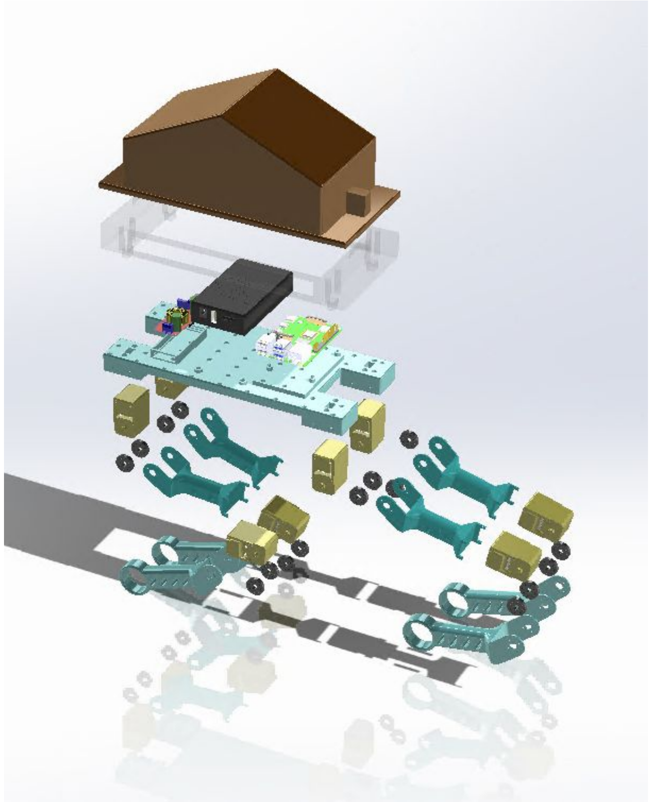
# GrabCAD Upload




# Rubric and Potential Points

**5 Points Title slide complete (Slide 1)**
**5 Points overall aesthetics, layout and formatting of the slides**
x 10 Points posting some rendering of your robot on the discussion board at least 24h in advance of deadline, and commenting constructively and positively on at least three other’s postings (show screenshots)
**x 10 Points 3D Renderings in perspective (Slides 4, 5)**
**x 10 Points Key components included (Slides 7, 8)**
**x 10 Points organic shape (no/few straight edges) (mostly filleted edges, seen well in slide 7)**
**x 10 Points photorealistic rendering (Slide 4)**
**x 10 Points context rendering (Slide 3)**
**x 10 Points animation (Slide 13,14)**
**x 10 Points exploded view (Slide 8,9)**
10 Points key specs listed including speed
**x 10 Points multiple poses shown (Slide 10,11)**
**x 10 Points detail close-up shown (Slide 7, 8)**
**x 10 Points side views with main dimensions (Slide 12)**
**x 10 Points sharing a relevant CAD component on GrabCAD or Thingiverse (show screenshot) (Slide 15)**
**Total: 120**

# Robotics Studio MECE 4611



**Spring 2025, Assignment 3**
**Anjali Parande**: arp2222
**Nicolas Alarcon**: na2946
**Submitted**: 2/18/2025, 4:30pm
**Total Grace Hours Gained**:
78.5 + 6 + 7.5 = 92

# The Concept: Roaree’s Moving Shack

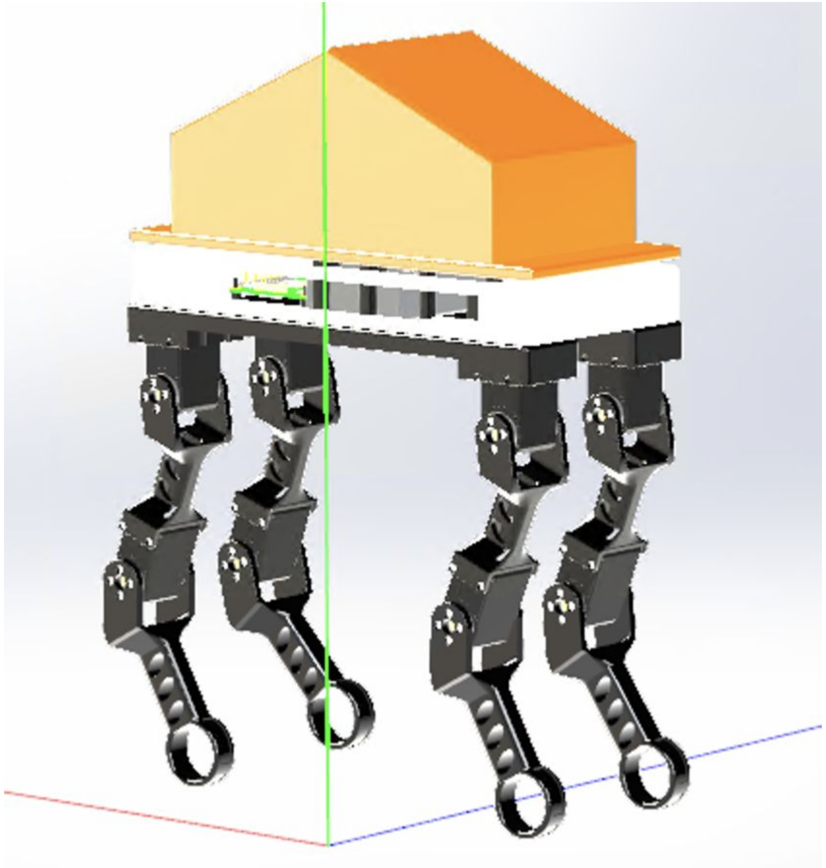
# Context Rendering

Nico

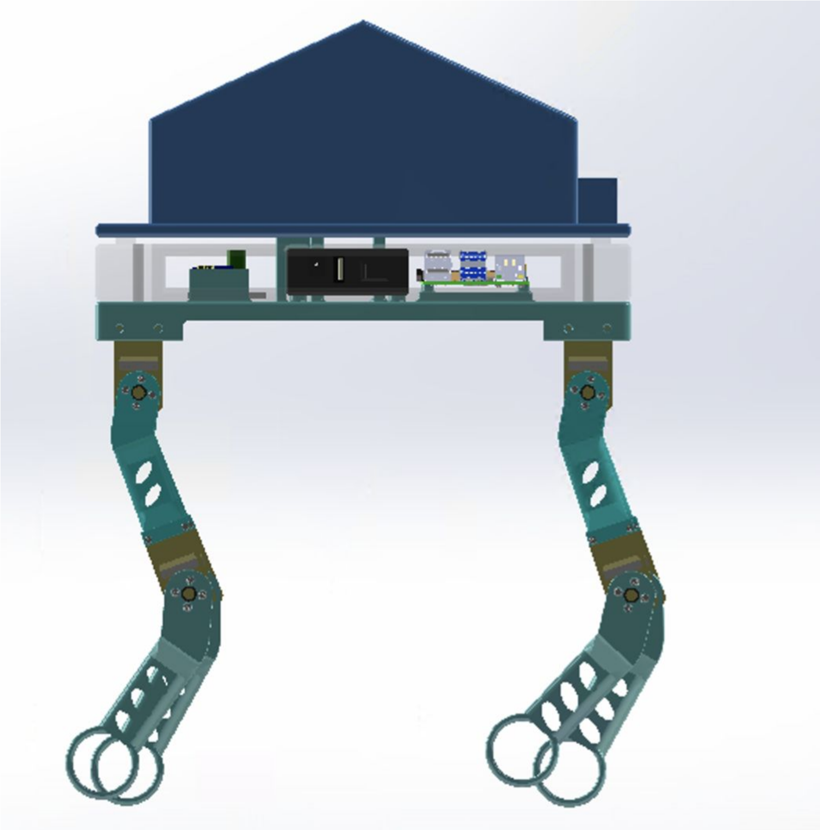
Anjali

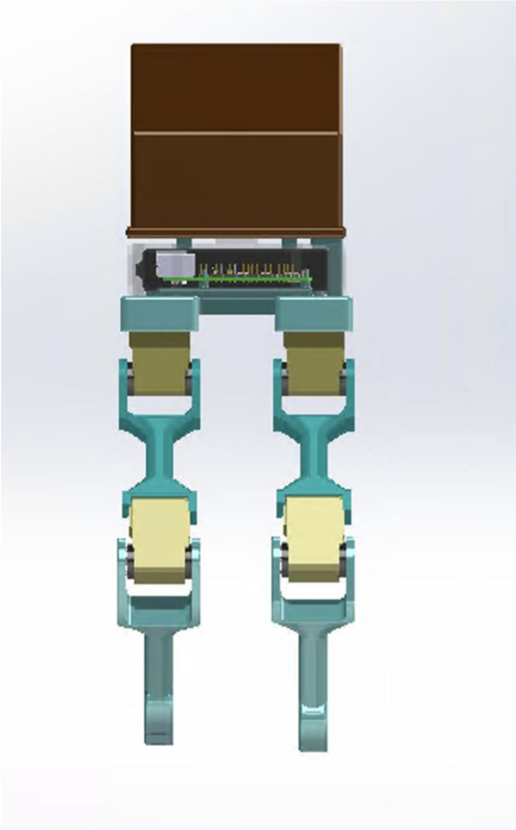
Roaree's
Moving Shack

# Photorealistic Rendering



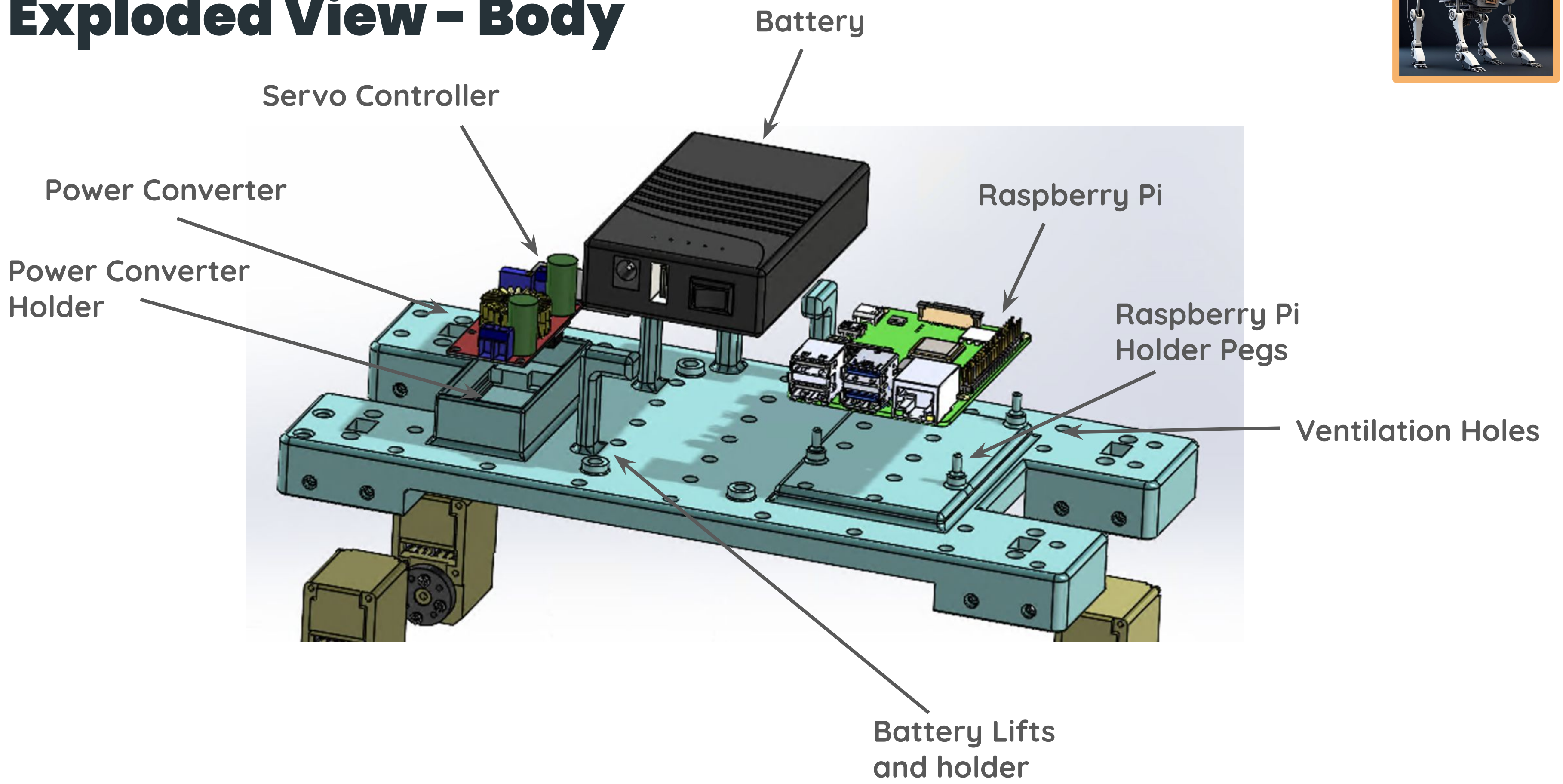
# 3D Rendering – Front and Side View



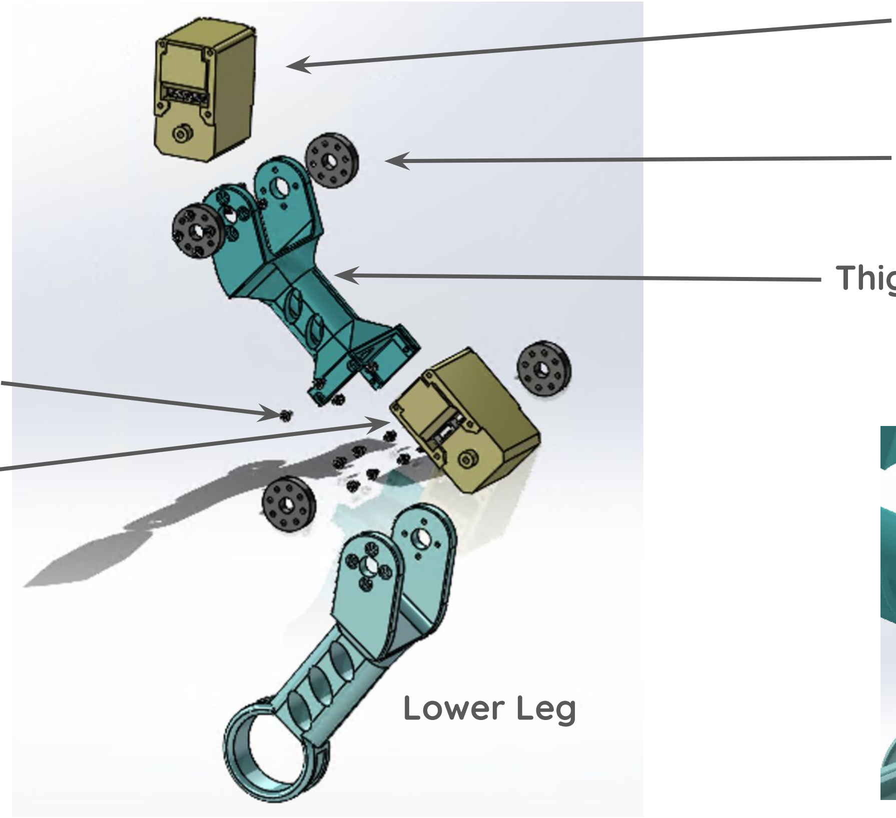


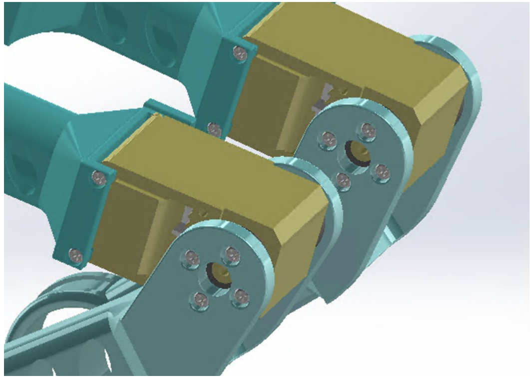
# Further Details

# Exploded View – Body

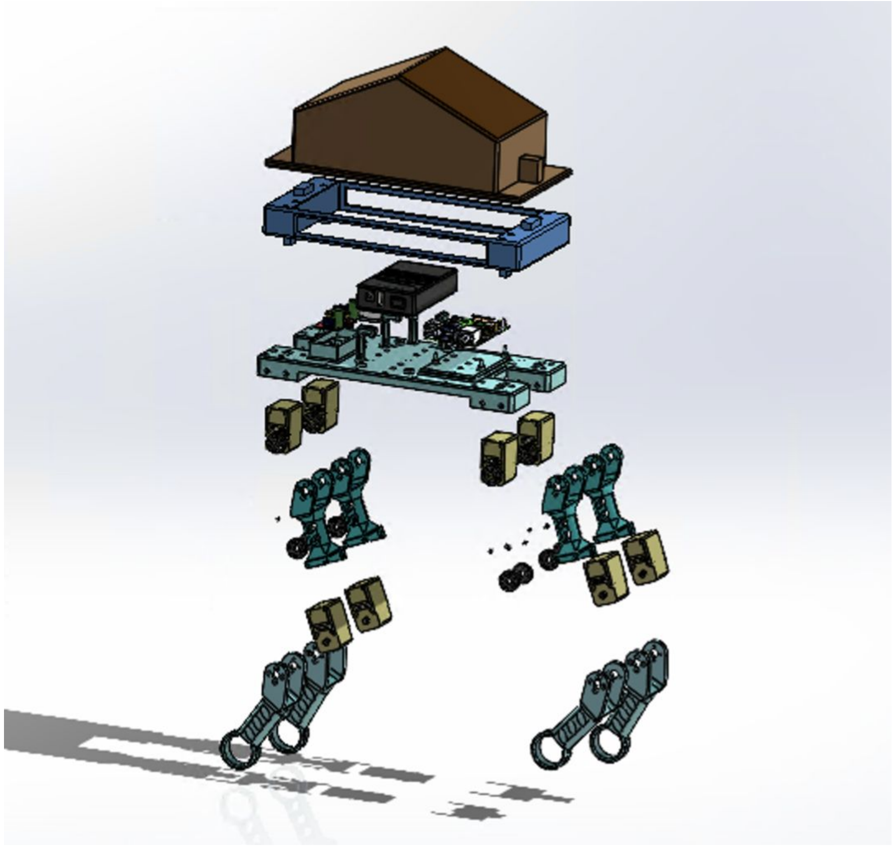



# Exploded View - Leg

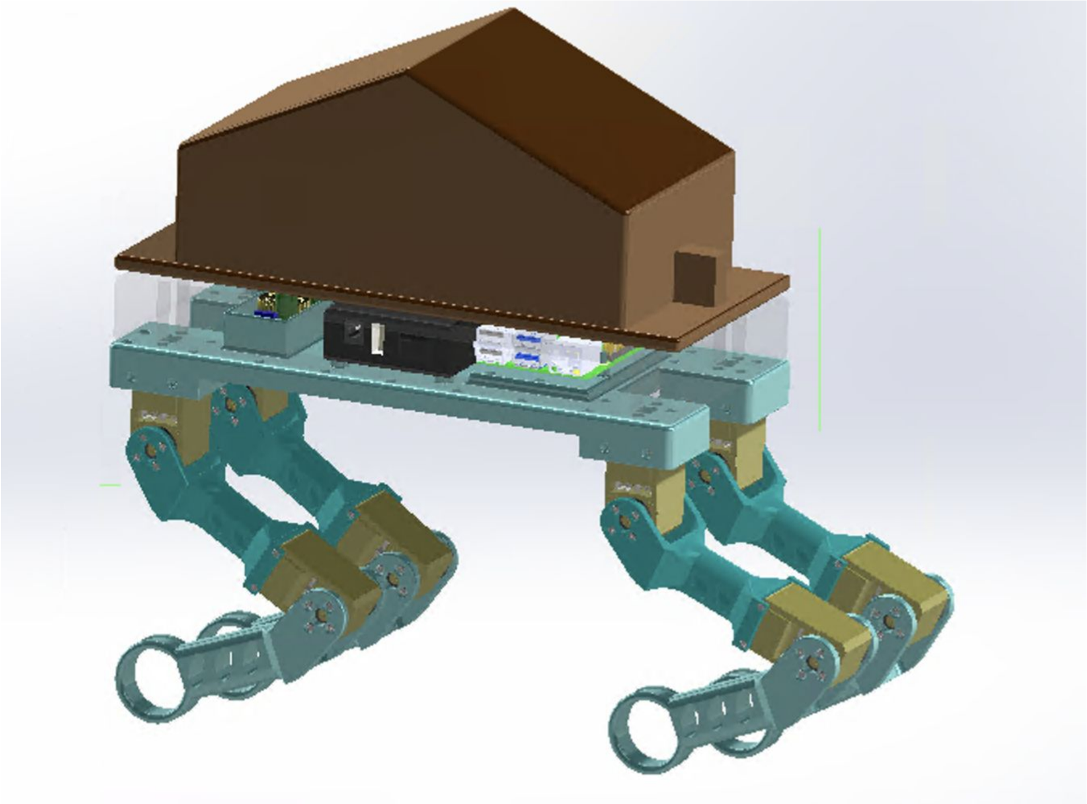


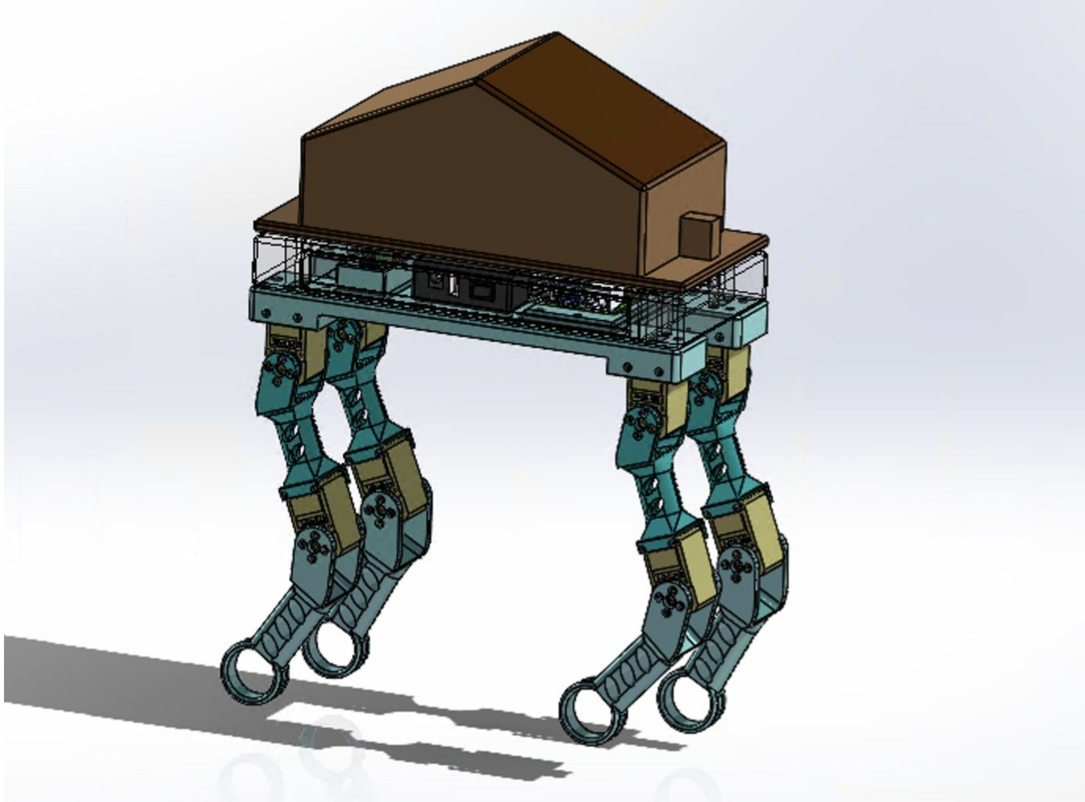
# Exploded View – Roaree!



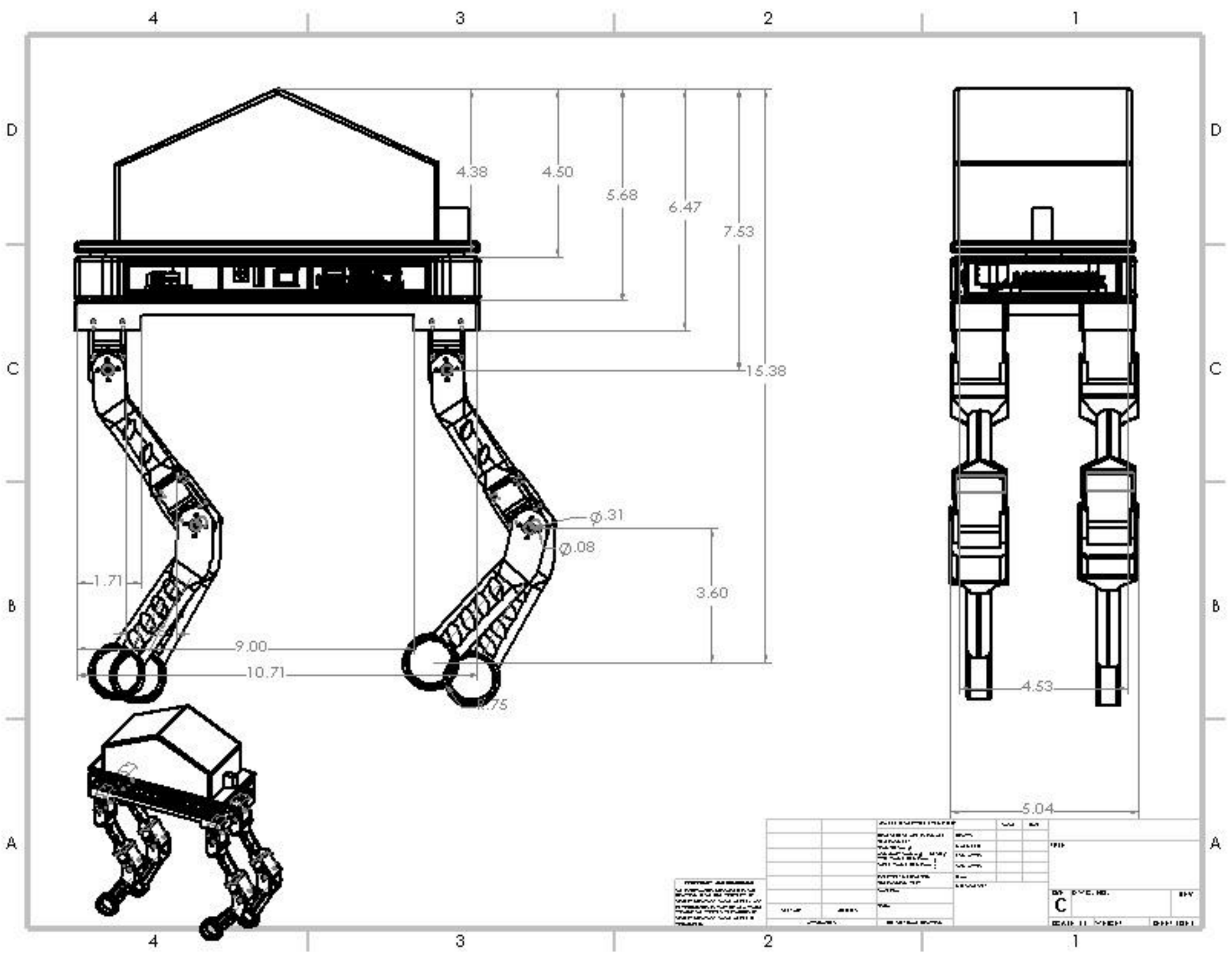
# Isometric View – Sitting!



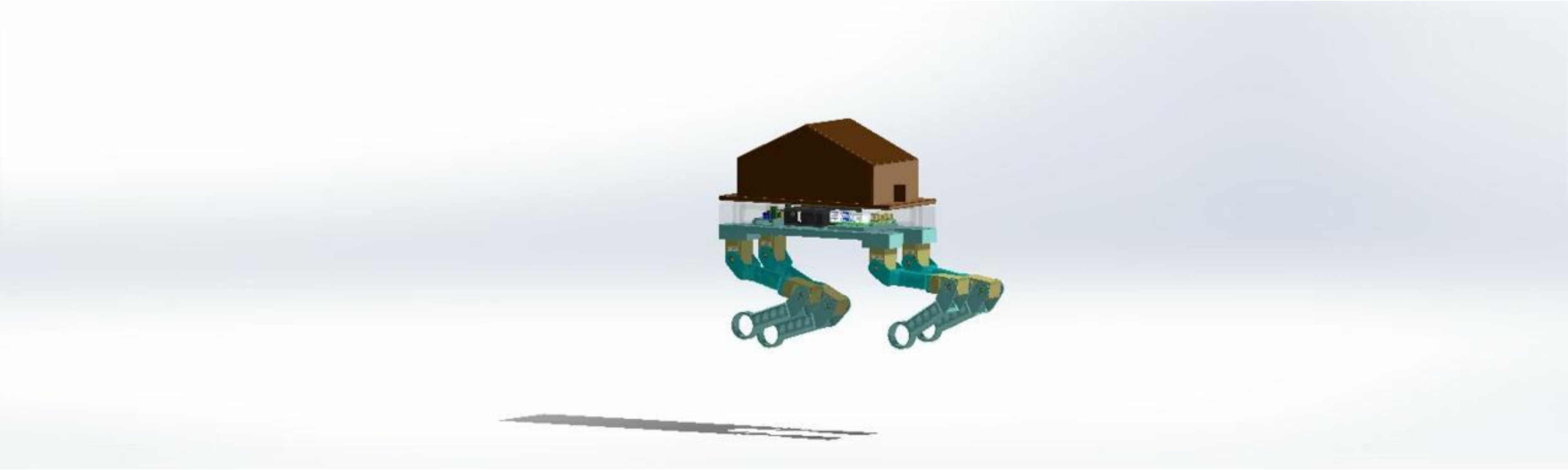
# Isometric View - Standing High!



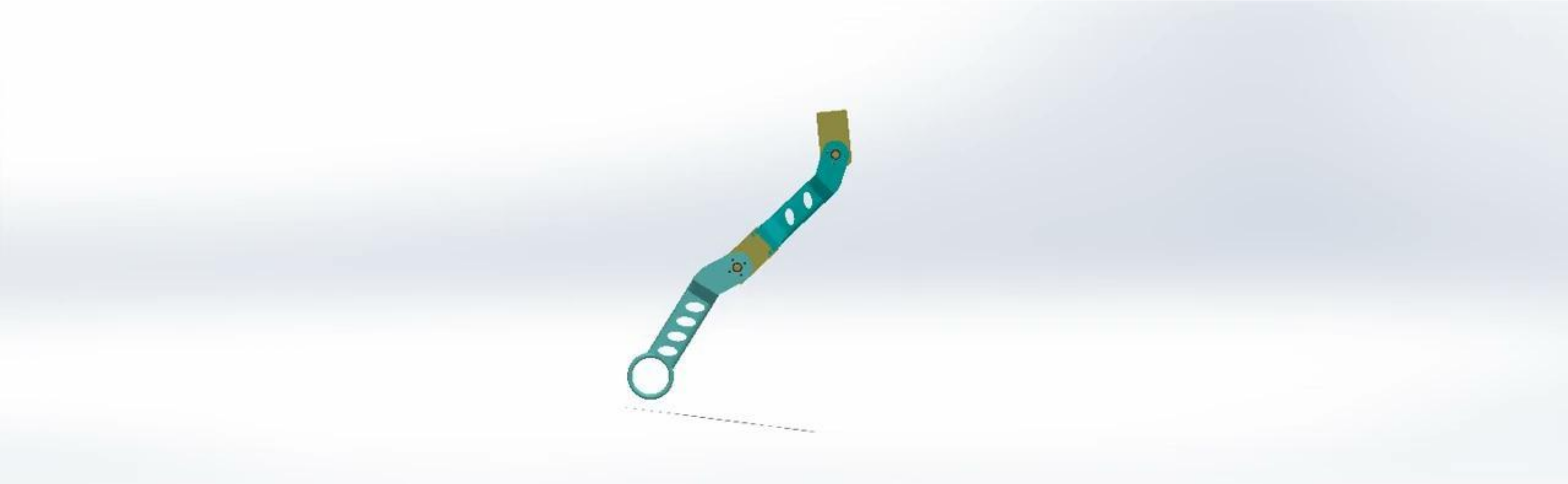
# Key Dimensions



# Animations – Sitting to Standing with One Leg Posed to Step : LINK TO VIEW



# Animations – Leg Moving: [LINK TO VIEW]



# Ed stem upload and comments

Comment •••

1 Answer

Anjali Parande
Now

I like how you chose to orient the electronics. how do you plan to ensure the robot will be stable while walking without "feet"?

Comment Edit Delete •••

Add comment

Sort by Newest

Lennart Schulze 14h

Improved level of detail and ran topology optimization to minimize weight of legs while supporting required forces.

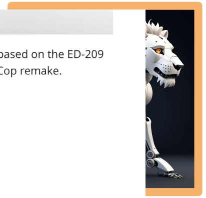
Reply •••

1 Answer

Anjali Parande
Now

I like how sleek this design is, and it looks like the legs will hold the head up without becoming too heavy!

Comment Edit Delete •••



My partner Fabio and I have created a detailed version of our RoboCop CAD design based on the ED-209 robot from the 1985 robocop, but with a modern aesthetic following the 2014 RoboCop remake.

Comment •••

2 Answers

Amie Agasino
2 hours ago

Such an awesome design! I love the details, especially the ridges in the body and legs giving it a more complete and professional look. Do the arms move?

Comment •••

Add comment

Anjali Parande
Now

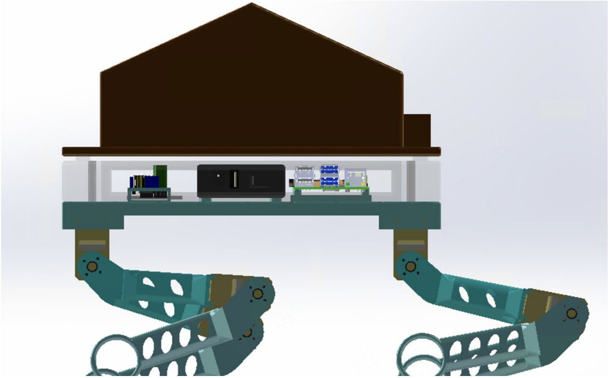
this design and concept is awesome!! will the electronics incorporate a camera so the robot can "see" its enemies?

## Moving Castle Detailed CAD Render #99

Anjali Parande
3 days ago in General

STAR WATCHING 87 VIEWS

Attached is our detailed CAD rendering! Please provide any advice or feedback



## Bill of Materials – Full Assembly

| ITEM NO. | PART NUMBER | DESCRIPTION | QTY. |
|---|---|---|---|
| 1 | BodyCovering | PLA | 1 |
| 2 | Servo Controller | | 1 |
| 3 | Power Converter | | 1 |
| 4 | TalentCell Battery | | 1 |
| 5 | CoveringBody | PLA | 1 |
| 6 | House | PLA | 1 |
| 7 | Raspberry Pi 4 Model B | | 1 |
| 8 | leg assembly | | 4 |

## Bill of Materials – Leg Sub Assembly

| ITEM NO. | PART NUMBER | DESCRIPTION | QTY. |
|---|---|---|---|
| 1 | SERVOMODEL | Rhino converted to STEP | 2 |
| 2 | robot ankle | PLA | 1 |
| 3 | robo_thigh | PLA | 1 |
| 4 | adapter 2.9inserts | | 4 |
| 5 | 99461A918 | Phillips Rounded Head Thread-Forming Screws | 20 |

# Rubric and Potential Points

1. 5 Points Title slide complete - Slide 1
2. 5 Points overall aesthetics, layout and formatting of the slides - All Slides
3. 10 Points posting some rendering of your robot on the discussion board at least 24h in advance of deadline, and commenting constructively and positively on at least three other's postings (show screenshots) - Slide 15
4. 10 Points 3D Renderings in perspective - Slide 5, 10, 11
5. 10 Points all key components included and labeled - Slide 7, 8
6. 10 Points organic shape (no straight edges) - Slide 7, 8
7. 10 Points photorealistic rendering - Slide 4
8. 10 Points animation - Slide 13,14
9. 10 Points exploded view - Slide 9
10. 10 Points key specs listed including speed, weight
11. 10 Points multiple poses shown - Slide 10, 11
12. 10 Points detail close-up shown - Slide 7, 8
13. 10 Points side views with main dimensions
14. 10 Points Bill of materials - Slide 16

**Total: 120 points**

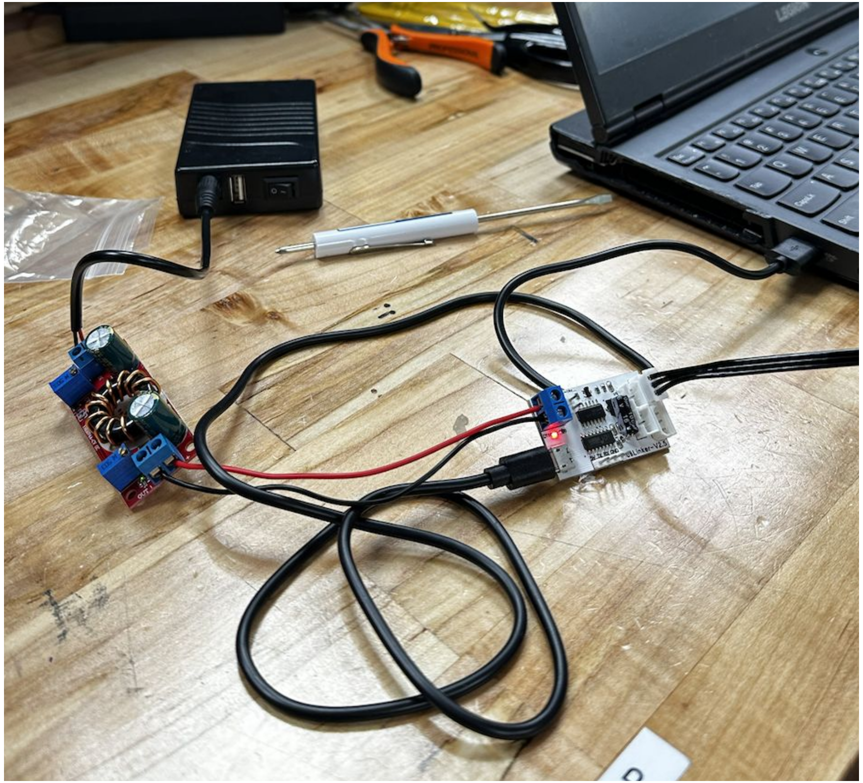
# Robotics Studio MECE 4611

**Spring 2025, Assignment 4 - Working Leg**

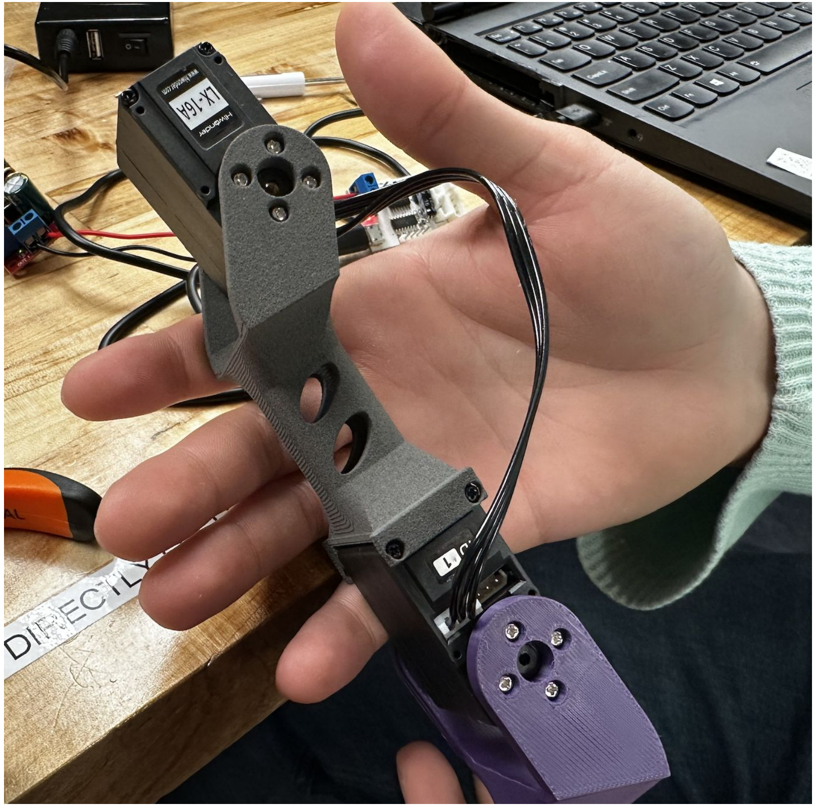
**Anjali Parande**: arp2222
**Nicolas Alarcon**: na2946
**Submitted**: 3/4/25 at 3:30pm

**Total Grace Hours Gained**: 8 hrs

# Leg Electronics Properly Connected



# Components Properly Bolted



# Different Materials and Design Testing

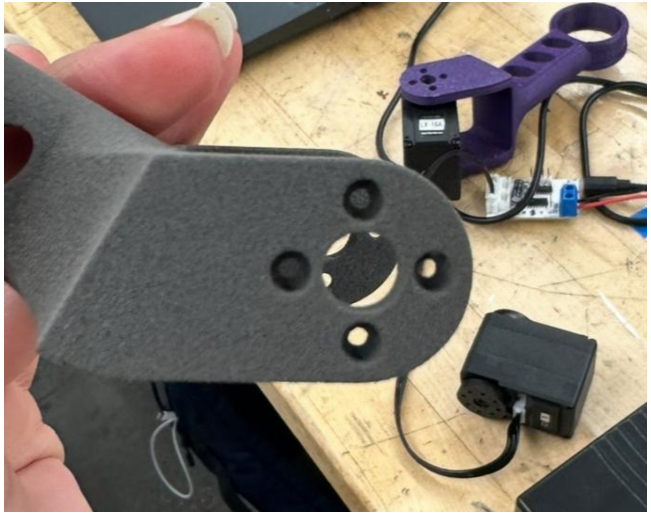
**Small filets and weak PLA infill led to a snap in the bracket**

**Printed with higher filet radius and stronger material (nylon)**

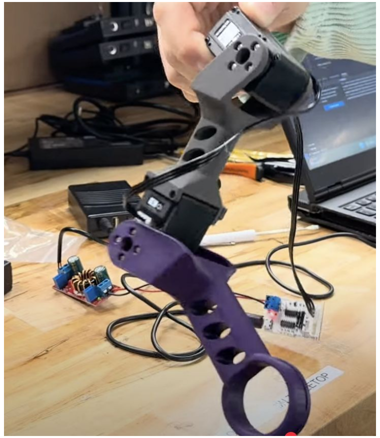
# Different Materials and Design Testing

Screw holes too small for servo

Printed with a higher tolerance and different material to avoid support debris



# Leg moving progression



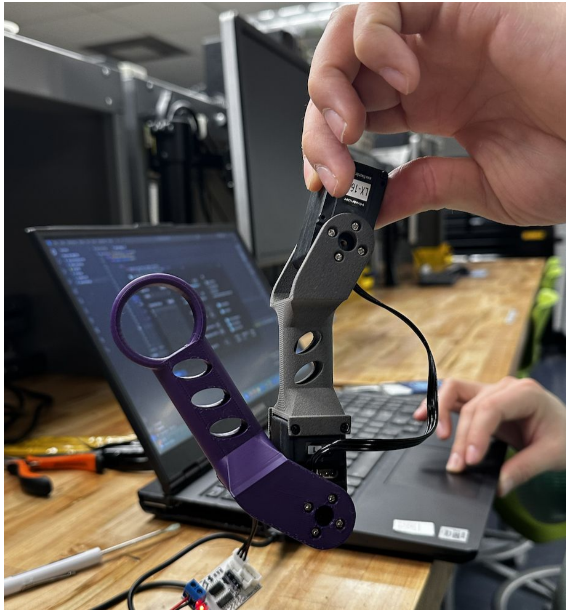
# Upper Leg Moving – [VIDEO LINK](#)

# Lower Leg Moving – [VIDEO LINK](#)

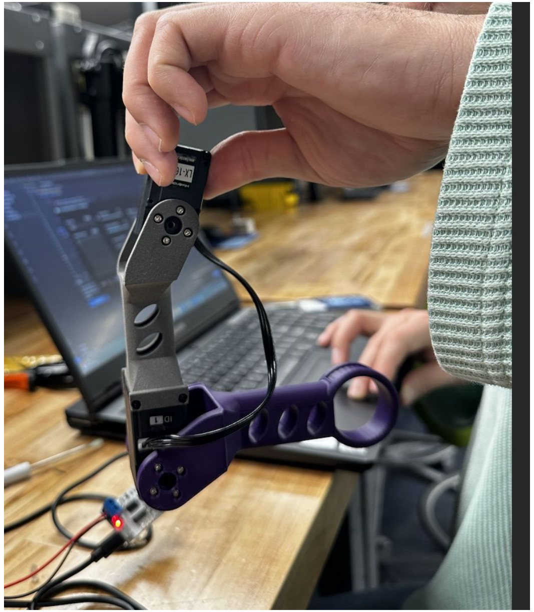
# Hello World! - [VIDEO LINK](#)

# Extreme Leg Positions – Measured

**240 Degrees**



**0 Degrees**



# Ed stem upload and comments

shack's first move! #149

Anjali Parande
15 hours ago in General

STAR WATCHING 21 VIEWS

IMG_1331.MOV

Comment Edit Delete •••

Anjali Parande
Now

This is very impressive! The legs look very thin, and I'm curious too see how fast it'll go.

Comment Edit Delete •••

Add comment

Anjali Parande
Now

This leg mechanism is super unique? Curious to know what you were inspired by and how it'll be integrated into your whole robot.

Comment Edit Delete •••

Add comment

Comment •••

1 Answer

Anjali Parande
Now

I love how simple and clean this leg design is! What's the max angle that the leg design can handle?

Comment Edit Delete •••

Add comment

# Code Exceptions

hello-world.py > ...

```python
from math import sin, cos
from pylx16a.lx16a import *
import time

#LX16A.initialize("/dev/ttyUSB0", 0.1)
LX16A.initialize("COM5")


try:
    servo1 = LX16A(1)
    servo2 = LX16A(2)
    servo1.set_angle_limits(0, 240)
    servo2.set_angle_limits(0, 240)
except ServoTimeoutError as e:
    print(f"Servo {e.id_} is not responding. Exiting...")
    quit()

t = 0
while True:
    servo1.move(sin(t) * 60 + 60)
    servo2.move(cos(t) * 60 + 60)

    time.sleep(0.05)
    t += 0.1
```

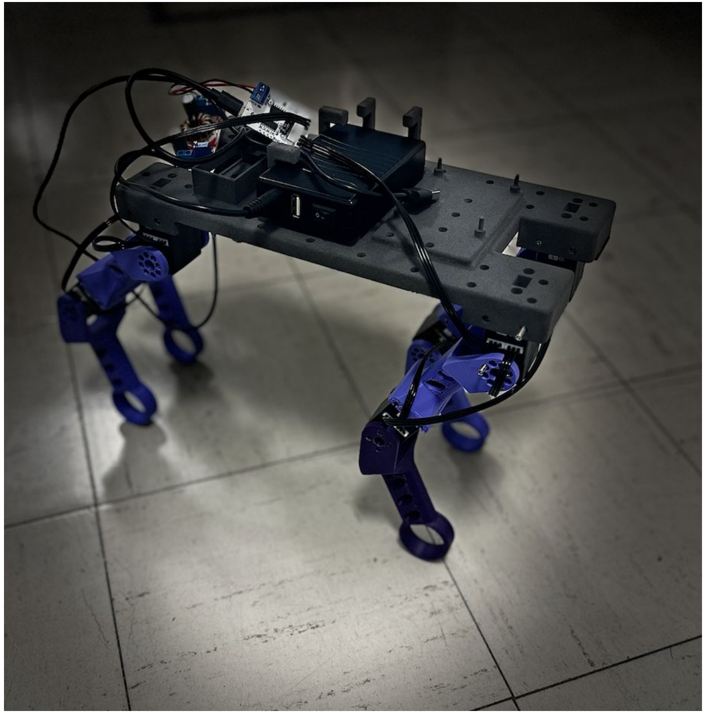
1. **5 Points Title slide complete - Slide 50**
2. **5 Points overall aesthetics, layout and formatting of the slides - Slides 50 - 61**
3. **10 Points Sequence of photos showing leg in motion - Slide 55**
4. **10 Points posting video of moving leg on the discussion board at least 24h in advance of deadline, and commenting constructively and positively on at least three other’s postings (show screenshots) - Slide 60**
5. **10 Points extreme leg positions tested and measured - Slide 59**
6. **10 Points form/fit issues identified, listed and addressed (show how) - Slide 53 and 54**
7. **10 Points all components properly bolted and connected (with inserts) - Slide 52**
8. **10 Points 3D-print quality, support structure removed - Slide 53 and 54**
9. **10 Points Different leg motion patterns explored - Slide 58**
10. **10 Points Leg Modularity demonstrated - Slide 56 and 57**
11. 10 Points Two or more legs tested in tandem
12. **10 Points Cables routed properly and securely - Slide 51**
13. **10 Points Exception handling in code catches motor disconnect - 61**

# Robotics Studio MECE 4611

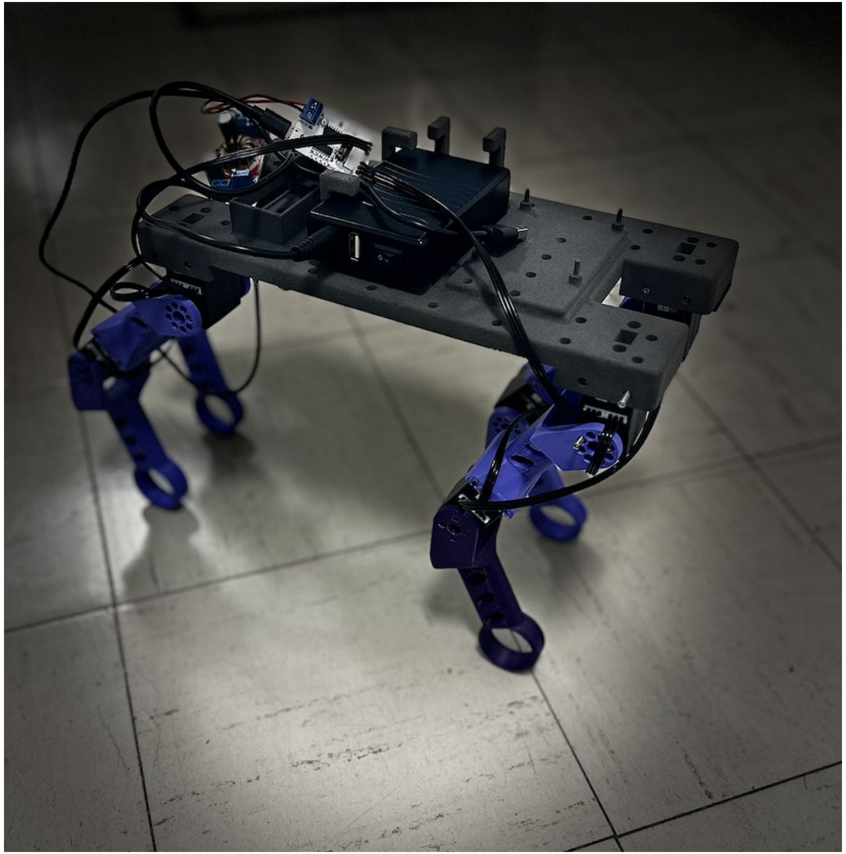
**Spring 2025, Assignment 5 - Assembled Robot**

**Anjali Parande**: arp2222
**Nicolas Alarcon**: na2946
**Submitted**: 3/26/25 at 8pm

**Total Grace Hours Used**: 20 hours

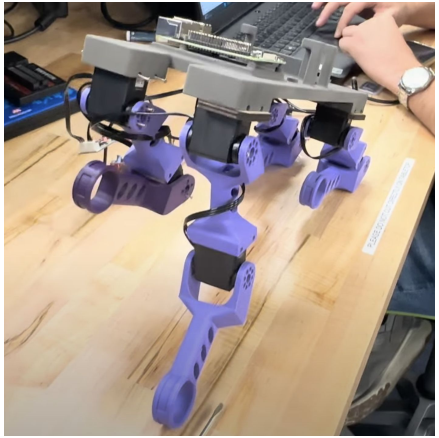


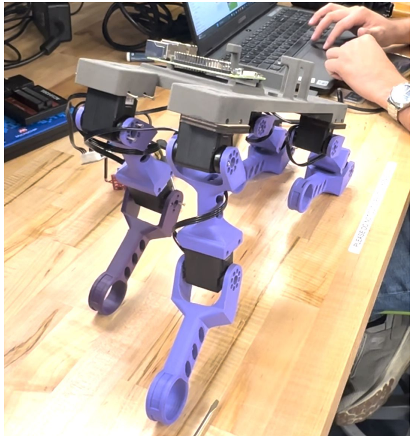
# Glamour Photo

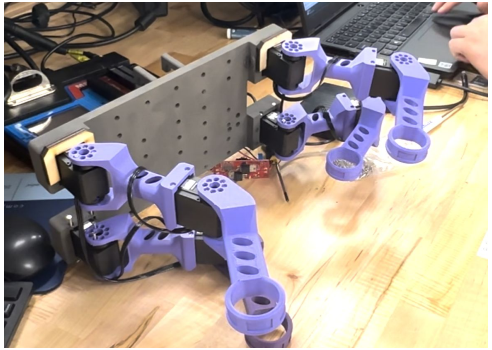


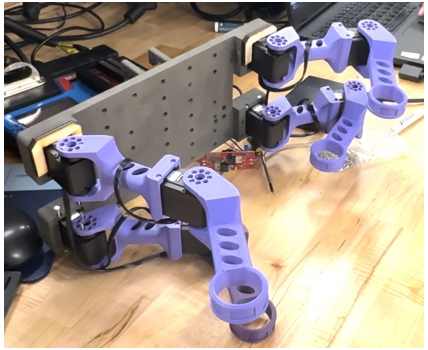
# Robot Legs Moving (shows modularity) - LINK

# Robot movement





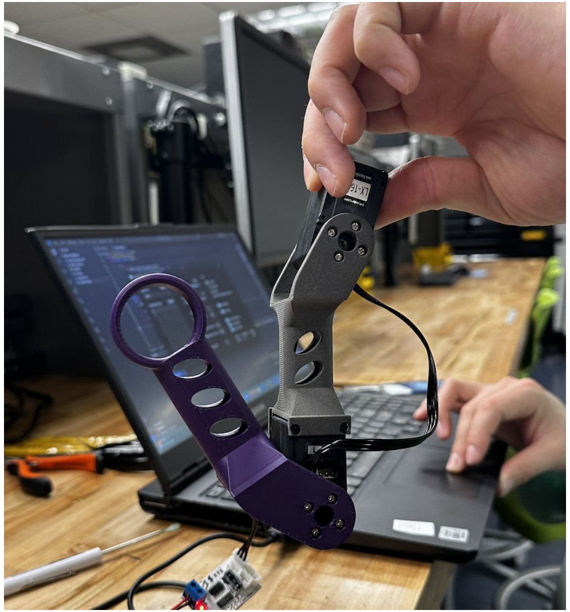




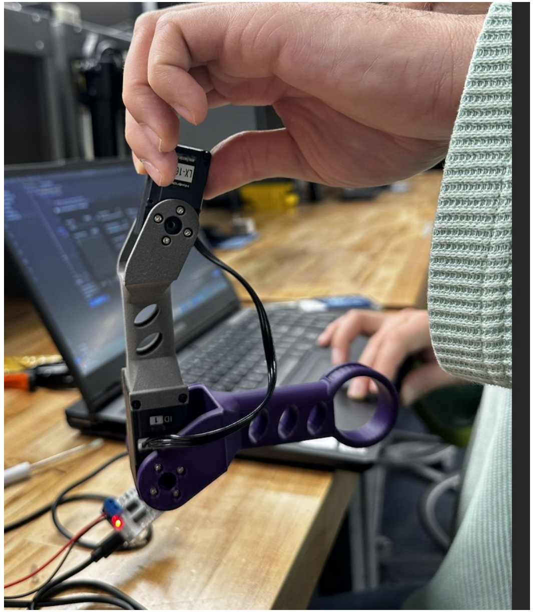
# Extreme Leg Movements: [Link]()

# Extreme Leg Positions - Measured

**240 Degrees**

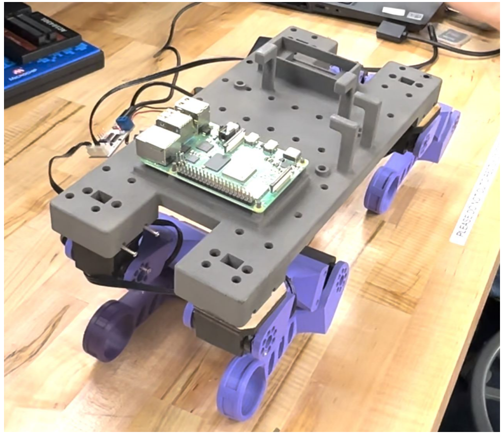


**0 Degrees**

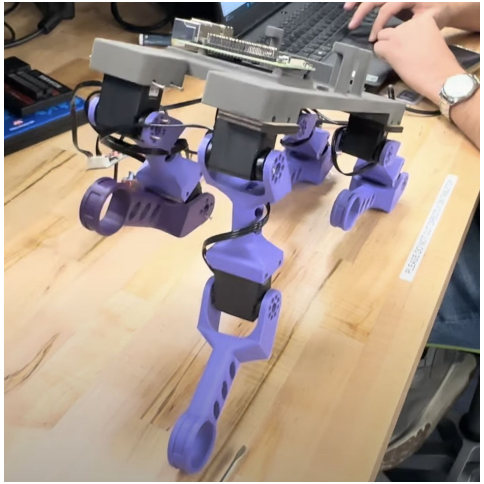


# Stability in Various Configs

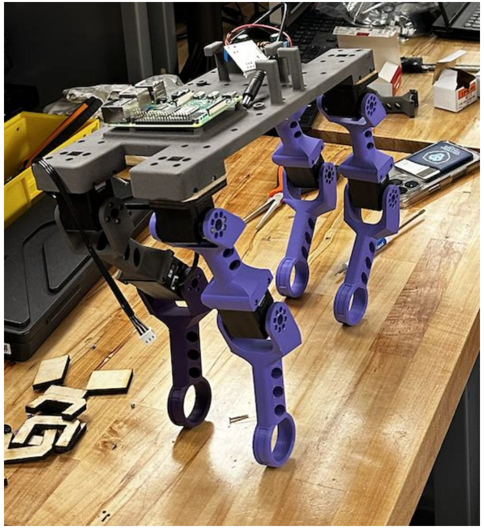
## Sitting and Stable



## One Leg and Stable



## Standing and Stable

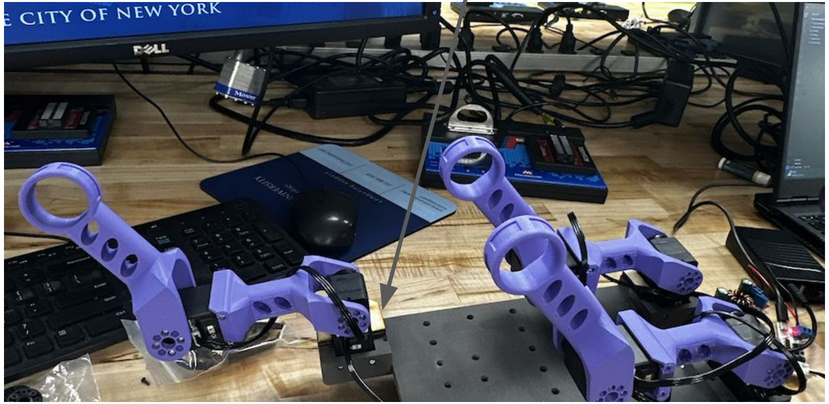


# Form / Fit Issues Identified

**Slot for Servo too big**

**Laser cut wood section to make fit tighter**

Now motor fits well

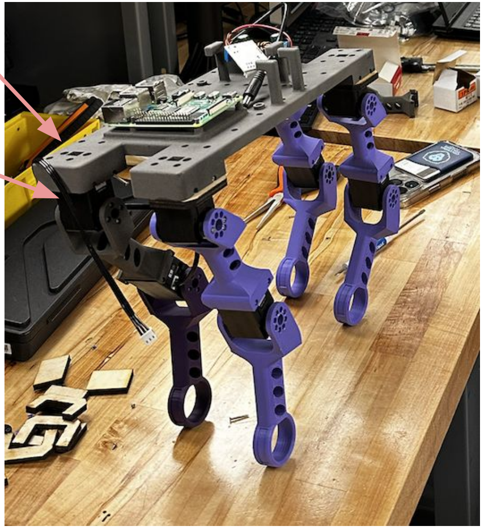


# All components bolted and secured, print quality

Components bolted

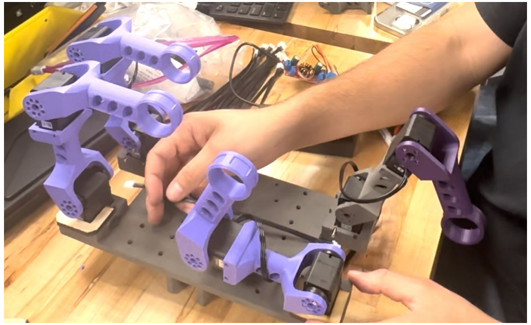
High quality and pretty base!

Support structure taken out!

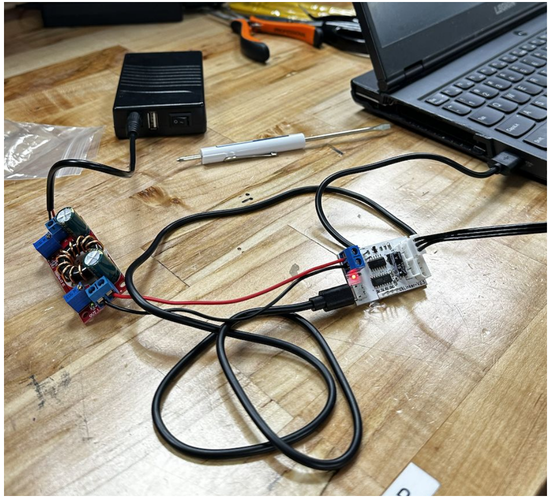


# Cables/ Wiring / Power

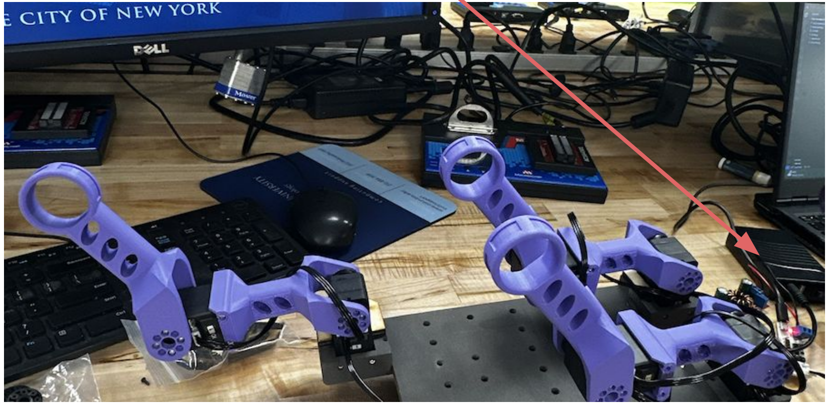
**Daisy chained motors**



**Wiring of Electronics**



**Servo powered by battery**



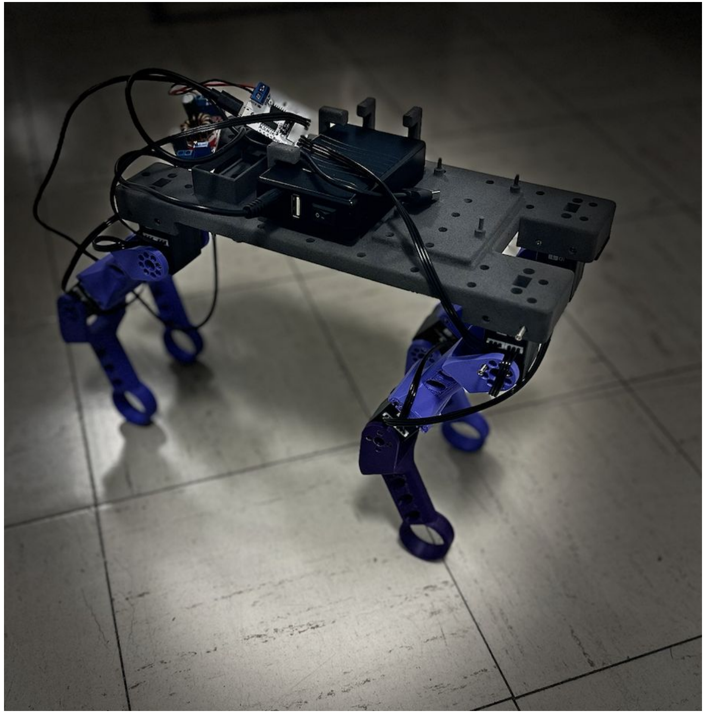
1. 5 Points Title slide complete - Slide 63
2. 5 Points overall aesthetics, layout and formatting of the slides - Slide 63 and beyond
3. 10 Points glamour photo of printed robot - Slide 64
4. 10 Points posting some rendering of your robot on the discussion board at least 24h in advance of deadline, and commenting constructively and positively on at least three other's postings (show screenshots)
5. 10 Points robot legs moving (frames shown + link to video) - Slide 65 and 66
6. 10 Points extreme leg interference tested and measured - Slide 67 and 68
7. 10 Points stability verified in various configurations - Slide 69
8. 10 Points form/fit issues identified and addressed - Slide 70
9. 10 Points all components properly bolted and connected - Slide 71
10. 10 Points 3D-print quality, support structure cleanly removed - Slide 71
11. 10 Points parts sanded and painted
12. 10 Points Robot modularity demonstrated - Slide 65
13. 10 Points Multiple configurations tested - Slide 65, Slide 69
14. 10 Points Cables routed properly and securely - Slide 72
15. 10 Points motors controlled directly from Raspberry Pi
16. 10 Points motors powered using battery - Slide 72
17. 10 Points overall aesthetics of the presentation - Slide 63 and beyond
18. 10 Points Robot boot test routine implemented
19. 10 Points Robot homing routine implemented

# Robotics Studio MECE 4611

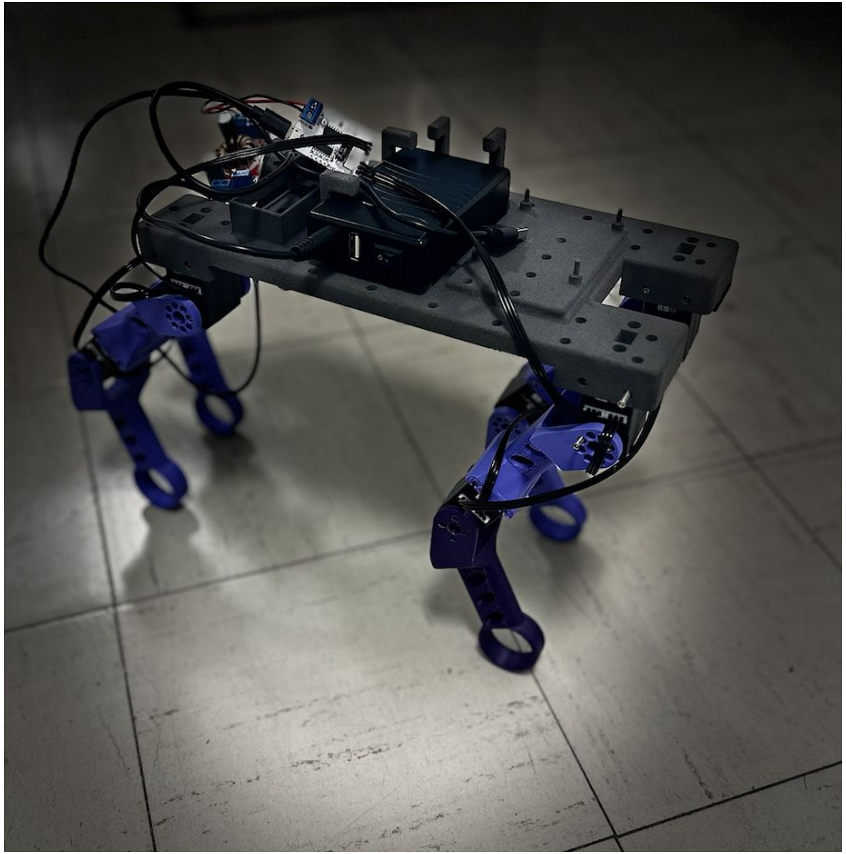
**Spring 2025, Assignment 6 - Baby Steps**

**Anjali Parande**: arp2222
**Nicolas Alarcon**: na2946
**Submitted**: 3/26/25 at 8pm

**Total Grace Hours Used**: 20 hours

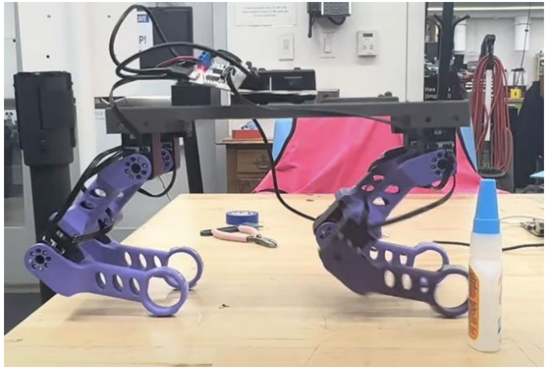


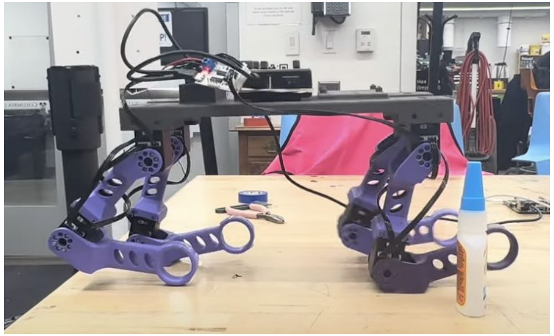
# Glamour Photo

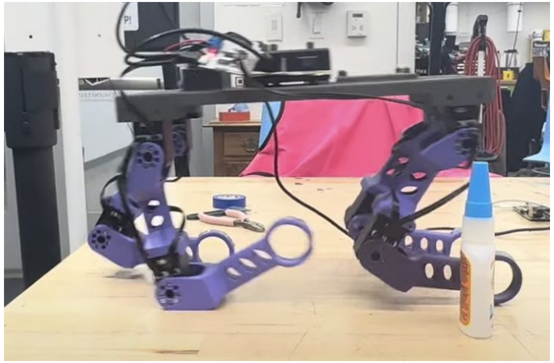


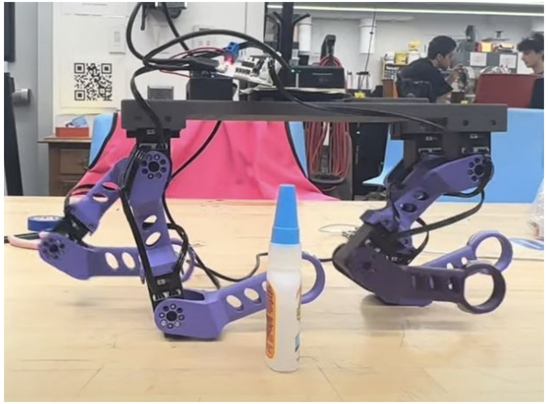
# Shacky's Baby Steps, [LINK]

# Shacky Moving!

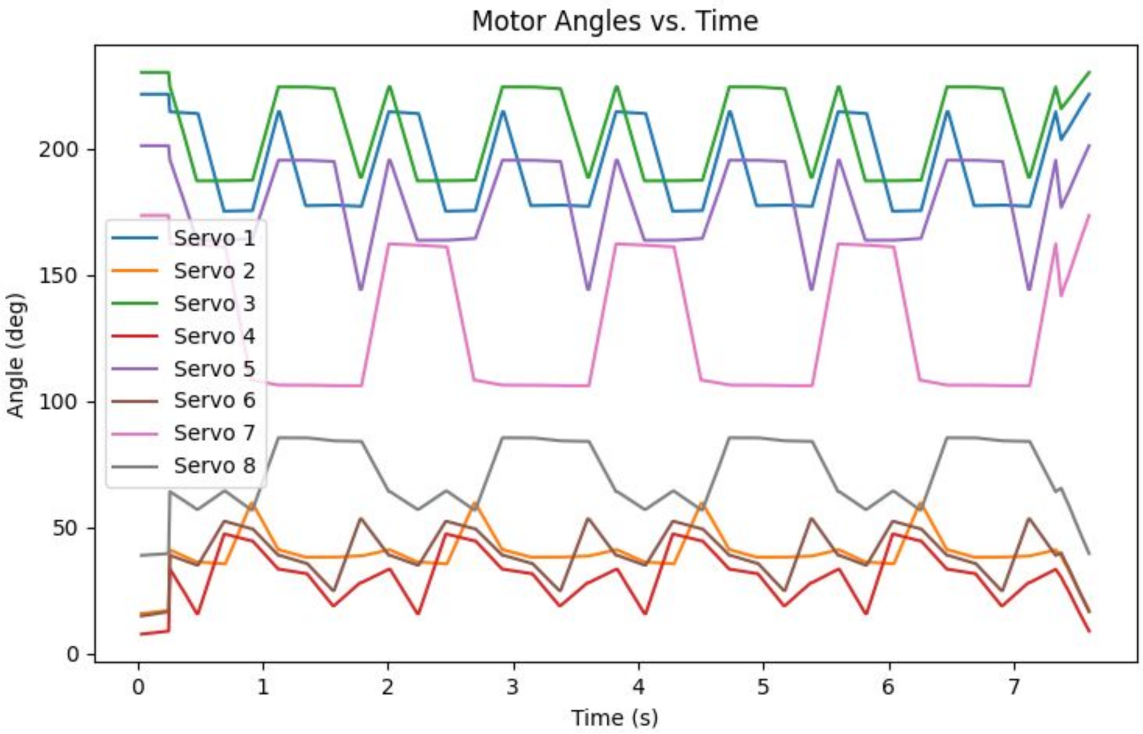






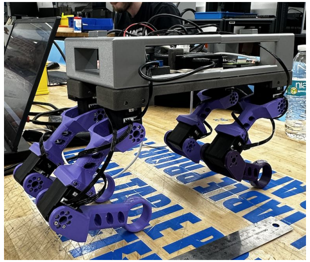


# Servo Motor Angles Over Time

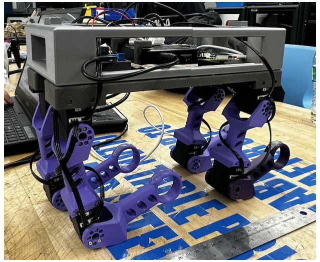


# Stability Confirmed in all walking frames

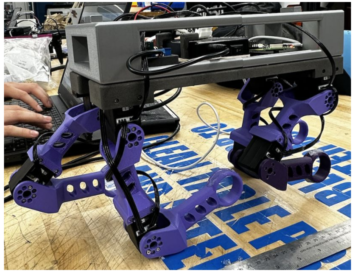
1



2

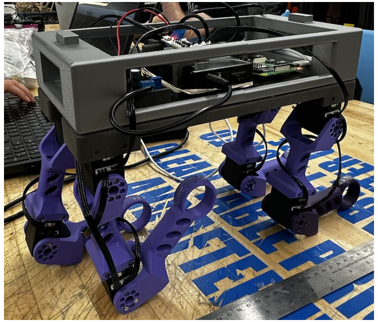


3

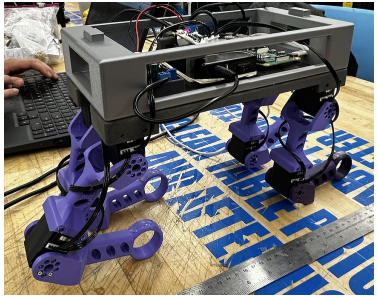


4

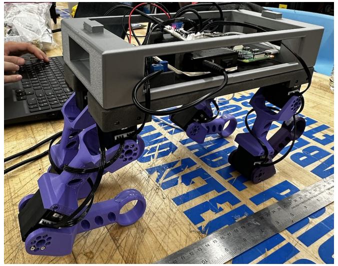
5



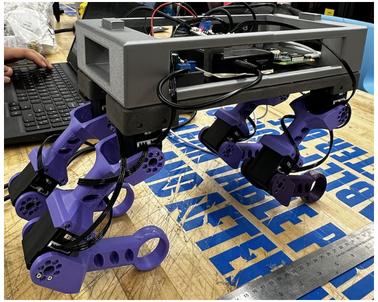
6



7



8



# Speed Measured, [LINK]

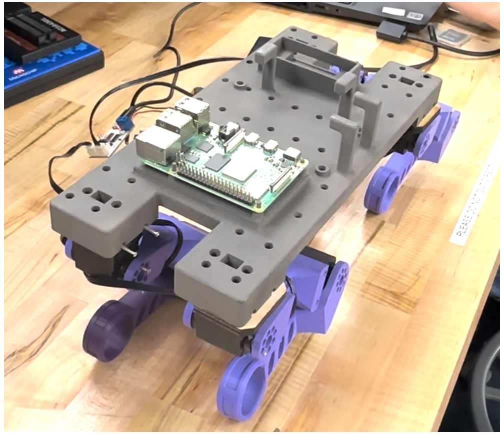
**Cm per cycle = 11.5 cm per cycle**

**Cm per sec = 5.75 cm per sec**

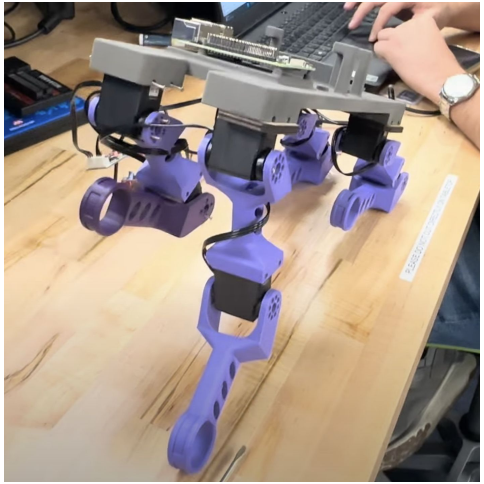
**Robot size per cycle = 0.32 robot sizes per cycle** (robot is 35.5 cm long)

# Stability in Various Configs

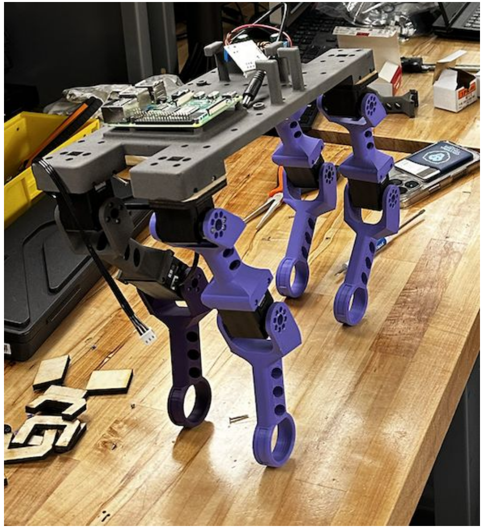
## Sitting and Stable



## One Leg and Stable



## Standing and Stable



# Multiple Walking Patterns Tested

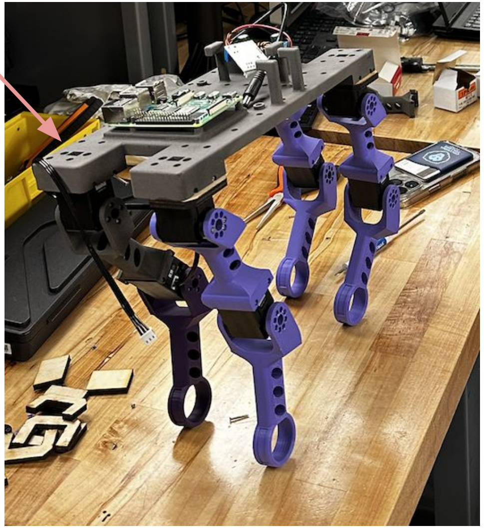
**Walking too slow, bad form,** [LINK]

**Walking Faster, better form,** [LINK]

# All components bolted and secured, print quality

Components bolted

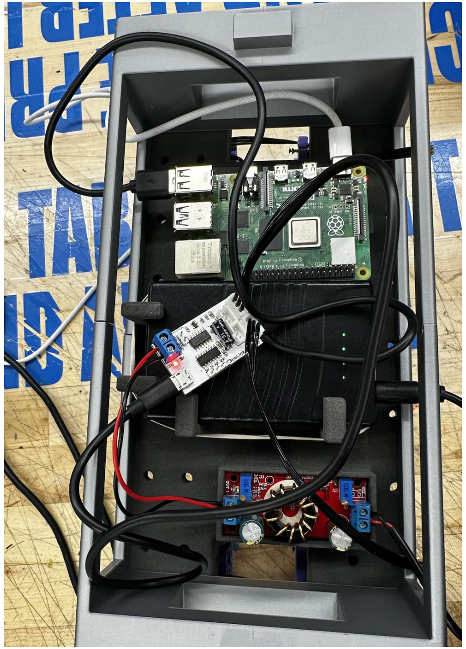
High quality and pretty base!



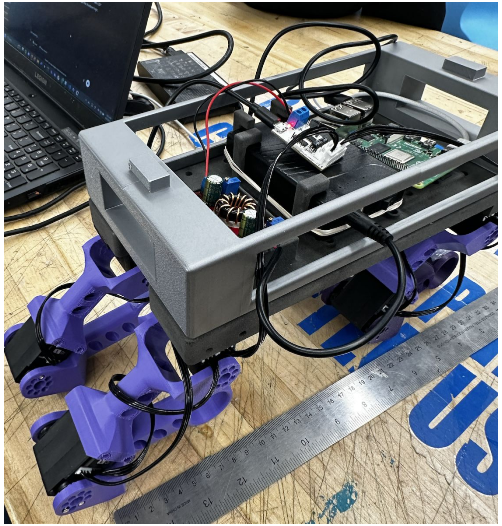
Support structure taken out!

# Cables/ Wiring / Power

### Wiring of Electronics



### Motors powered by battery



### Daisy chained motors

# Shut Down Procedure

```python
def move_to_sit(tol=1.0):
    """
    Moves servos to the sitting position and checks if they reached the tar
    If a servo did not reach the target within the tolerance, its LED is fl
    """
    # Get current positions.
    current_pose = get_current_pose()
    print("Moving servos to the sitting pose...")
    move_segment(current_pose, sitting_pose, steps=50, step_duration=0.05)

    # Check positions after moving.
    current_pose = get_current_pose()
    for i in range(8):
        if abs(current_pose[i] - sitting_pose[i]) > tol:
            print(f"Servo {i+1} did not reach sitting position (target: {si
            flash_led(servos[i+1], cycles=5, on_time=0.5, off_time=0.5)
            play_alert_sound(cycles=3)
        else:
            print(f"Servo {i+1} reached its target position.")

def disable_all_torque():
    """
    Disables torque on all servos.
    """
    for i in range(1, 9):
        try:
            servos[i].disable_torque()
            print(f"Servo {i} torque disabled.")
        except Exception as e:
            print(f"Error disabling torque for servo {i}: {e}")
```

```python
def flash_led(servo, cycles=5, on_time=0.5, off_time=0.5):
    """
    Flashes the LED on a given servo for a number of cycles.
    """
    for _ in range(cycles):
        servo.led_power_on()
        time.sleep(on_time)
        servo.led_power_off()
        time.sleep(off_time)

def play_alert_sound(cycles=1):
    """
    Plays an alert sound. Ensure that "alert.wav" is in the same directory.
    """
    for _ in range(cycles):
        os.system("aplay alert.wav")
        time.sleep(0.5)
```

# Posted on Ed Discussion – [LINK]

## Shacky's Baby Steps #192

A

Anjali Parande
20 minutes ago in **General**

STAR WATCHING 3 VIEWS

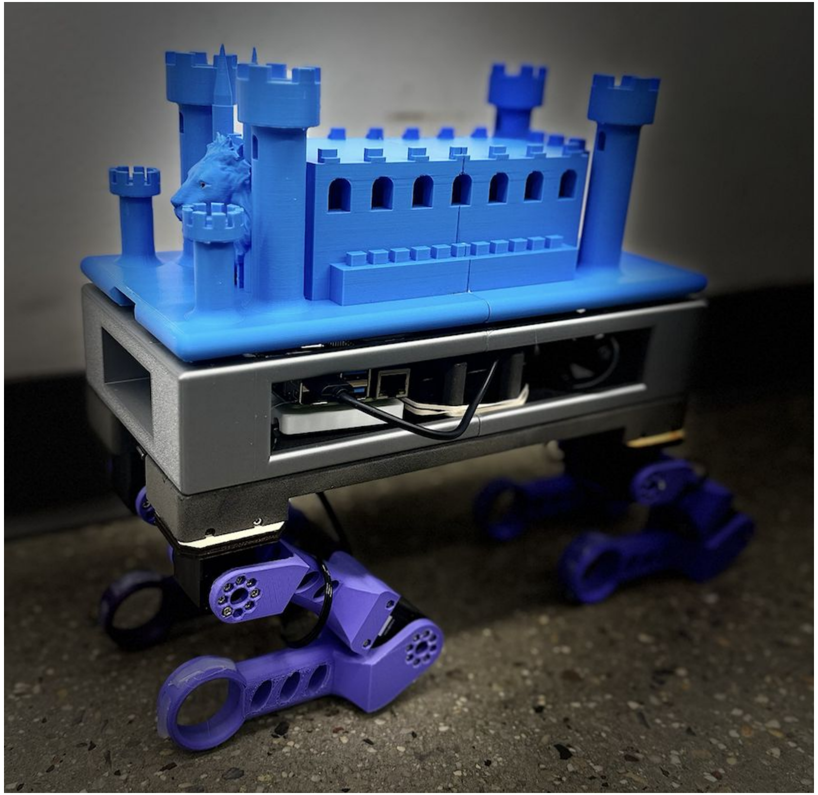
Shacky is a little bit uncomfortable walking, but she's doing her best!!

https://youtu.be/UqpqmQE3tbY

Comment Edit Delete •••

1. **5 Points Title slide complete - Slide 74**
2. **5 Points overall aesthetics, layout and formatting of the slides - Slide 74 - 86**
3. **10 Points glamour photo of working robot - Slide75**
4. **10 Points robot moving (frames shown + link to video) - Slide 76, 77**
5. **10 Points Plotted motor angles as function of time. - Slide 78**
6. **10 Points Robot speed measured (cm per cycle, cm per sec, robot sizes per cycle) - Slide 80**
7. **10 Points Robot stability verified in various locomotion configurations - Slide79, 81**
8. **10 Points all components properly bolted and connected - Slide 83**
9. **10 Points 3D-print quality, support structure removed - Slide 83**
10. 10 Points Robot sanded and painted
11. **10 Points Multiple walking patterns tested - Slide 82**
12. **10 Points Cables routed properly and securely - Slide 84**
13. 10 Points motors controlled directly from Raspberry Pi
14. **10 Points motors powered using battery - Slide 84**
15. **10 Points post some video of the walking robot on Discussion Board (show screenshot, provide link) - Slide 86**
16. 10 Points post video of your robot on your online portfolio (include screenshot and link)
17. 10 Points Robot ongoing health test routine implemented
18. **10 Points Robot shutdown routine implemented - Slide 85**

# Robotics Studio MECE 4611



**Spring 2025, Final Performance Evaluation**

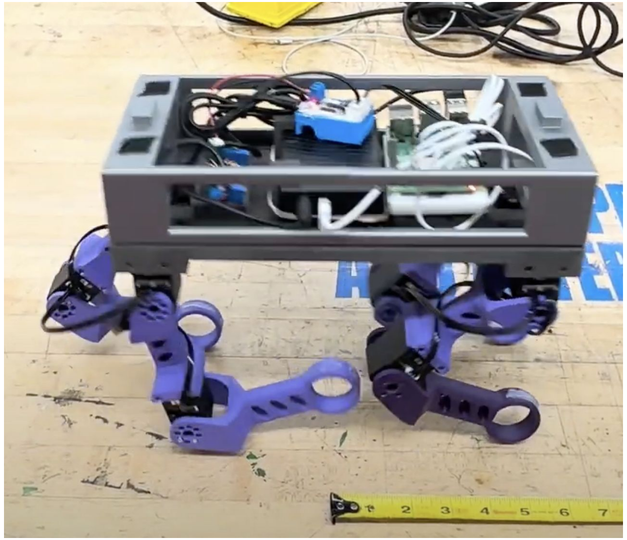
**Title of Robot: Roaree's Moving Shack**

**Anjali Parande**: arp2222
**Nicolas Alarcon**: na2946
**Submitted**: 5/06/25 at 11 pm

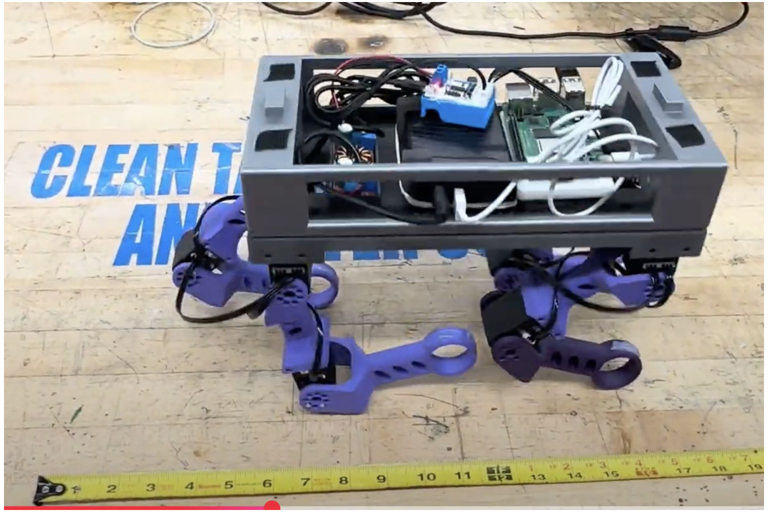
# Speed Measured, LINK

Cm per sec = 3.49 cm per sec

# Speed Frames = [LINK]



At 5 inches at 0:02 of the video



At 16 inches at 0:10 of the video

**Speed = 11 inches / 8 sec = 3.49 cm / sec**