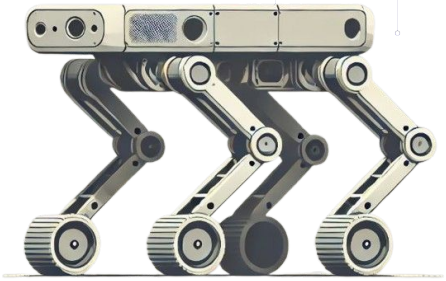
# WALT



## Wheeled Autonomous Locomotion Traveler

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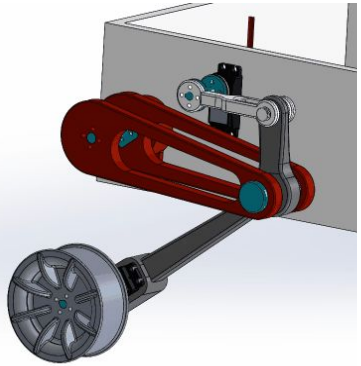
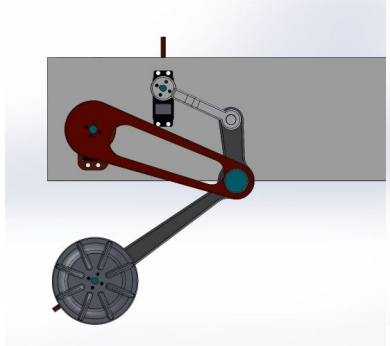
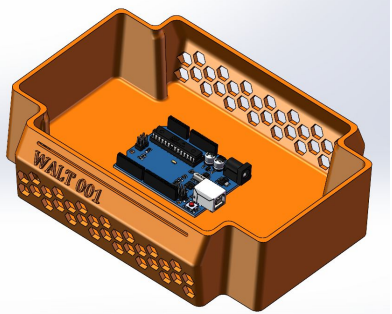
Group 6 | MECENG 239 |
Presentation 2

# Hardware Design

- 4-linkage leg has been designed and 3D printed with PLA.
- FEA analysis was carried out on shank and thigh → durable strength under robot load with 1.5 FOS and 10000 cycle fatigue test.
- Robot body prototype was designed for holding electronics, heat dissipation, and impact resistance.
- Electronics diagram involving Arduino, 8 servo motors, 4 DC motors, 5200mAh 7.4V battery, and others is in progress.

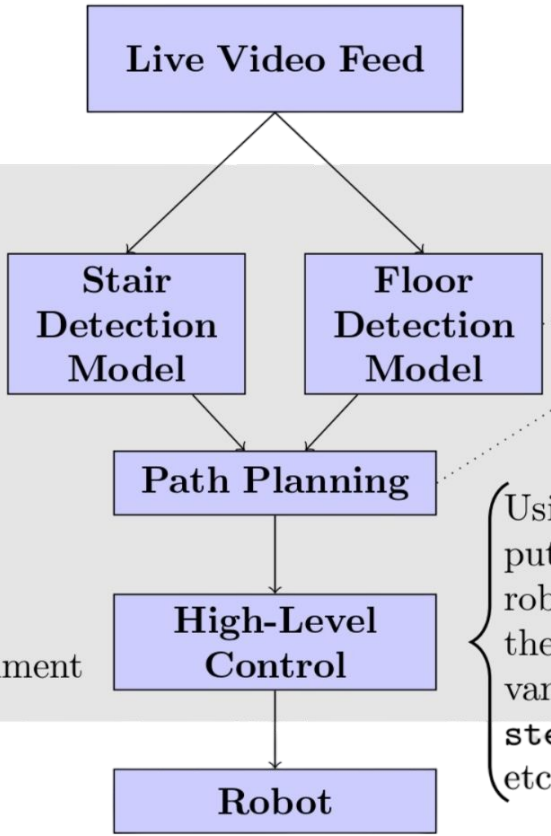




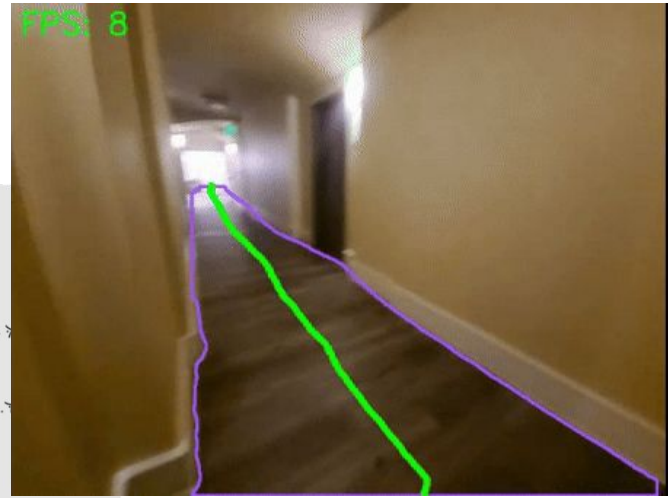




# Perception




The stair detection model has not been implemented yet. Developing this model is the next task, to pass the target route fully autonomously.




Using a PID controller to compute a `turn_rate` to steer the robot. After implementing the Stair Detection, more advanced control parameters, like `step_heigt`, `step_depth` and etc. are needed.

# Future Tasks & Challenges

1. Finish the hardware design.
2. Assemble the robot and deploy the servo control on the microcontroller.
3. Test the autonomous robot driving and walking on a plane surface in a corridor.
4. Develop a stair/obstacle detection model.
5. Implement the climbing control.

→ Robot is able to pass the target route fully autonomously!