

Stride Gear

Servo actuated bipedal walking robot called "Stride Gear"

A project in IN5590 by Jakob Solberg Berntzen
E-mail: jakobsbe@ifi.uio.no

1 Intro

The robot move by alternating between normal walking and gliding on its motor-driven belt wheels, allowing it to walk at high speeds as if it were on a conveyor belt, make sharp turns, and step over or onto obstacles.

- Design the robot to walk with smooth, natural movements.
- Ensure the robot can step over or onto obstacles with ease.
- I want the robot to be capable of rolling across smooth surfaces and walking up uneven terrain, like staircases.

2 Tools

The most important tool I've used is a 3D printer. All the components not listed below were 3D printed. Additionally, I've soldered some components and used glue for assembly.

- Dynamixel AX12
- Dynamixel AX18
- LiPo Battery
- Arduino Uno R3
- Dynamixel Arduino Shield
- DC motor
- MPU-6050
- ROB-14450 motor driver
- Bread board

3 Code

I programmed in C/C++ using the Arduino IDE. Below, you'll find a list of the libraries I used:

- Dynamixel2arduino.h
- Wire.h
- SparkFun_MPU9250_DMP.h

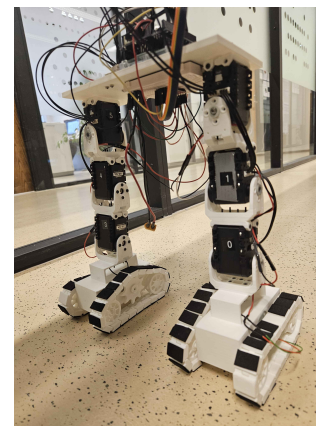
4 Conclusion

If I were to build this robot again, I would definitely choose different materials for the wheels and feet—likely incorporating more metal and relying less on 3D printing. I'd also opt for an off-the-shelf wheel system instead of a custom-printed one.

Another area for improvement is the electronics. I could have created a neater system by using a development solder board or, even better, producing a custom PCB with all the required components. However, due to time constraints, this wasn't feasible.

I encountered some challenges, such as the initial motor not being powerful enough, which required me to replace it. While the robot isn't fully functional yet, I believe that with more time, it could be completed and optimized. Given the time limitations, I'm satisfied with the results achieved.

Extra figures



Credit:
<https://www.thingiverse.com/thing:3937170>
<https://grabcad.com/library/socket-dynamixel-3>



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GitHub repo →

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