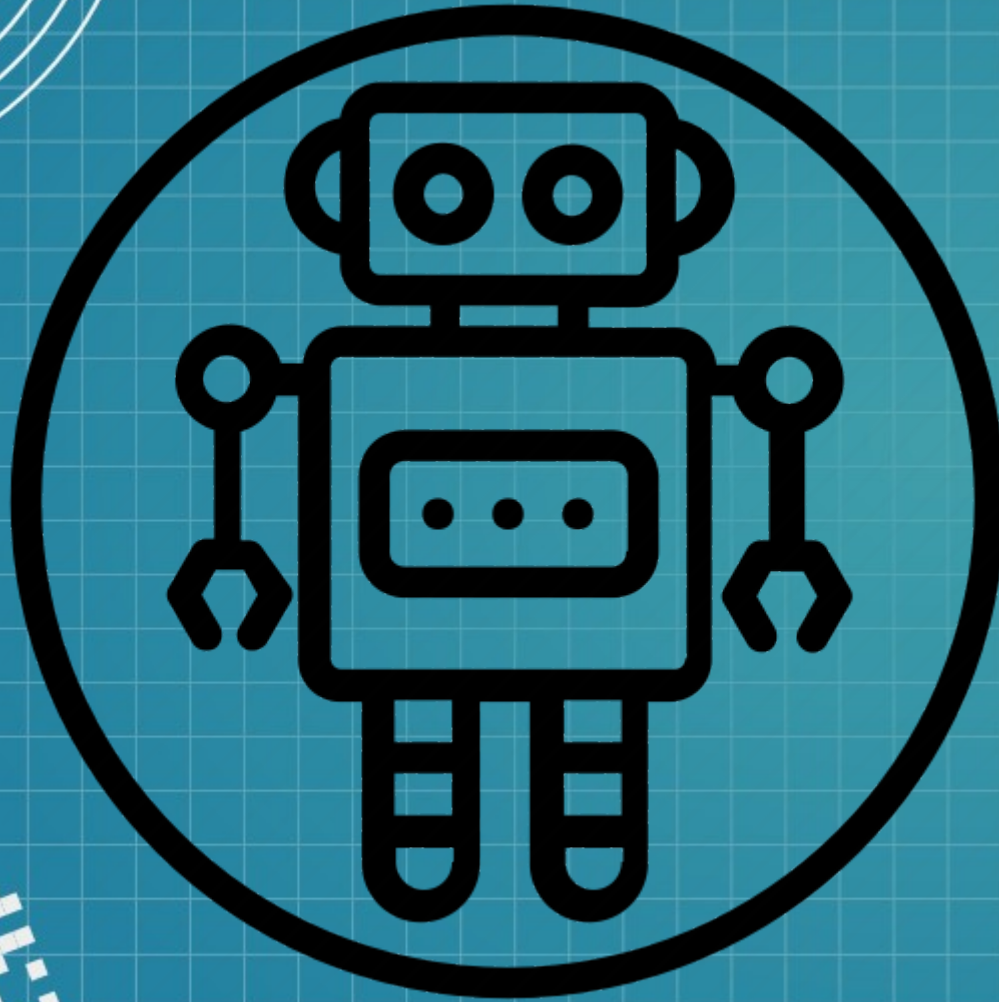
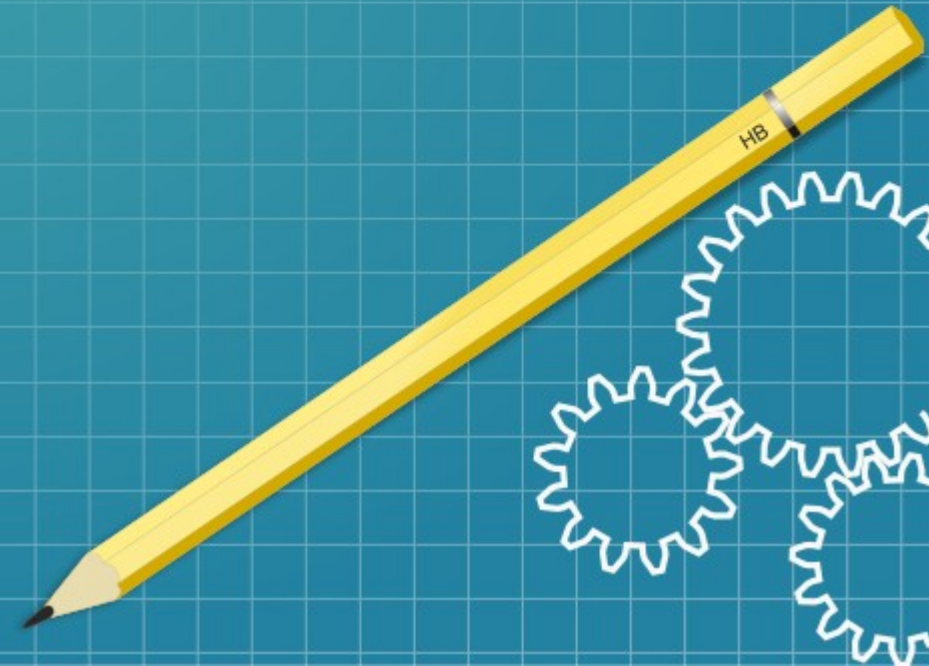


# Intelligent Robot



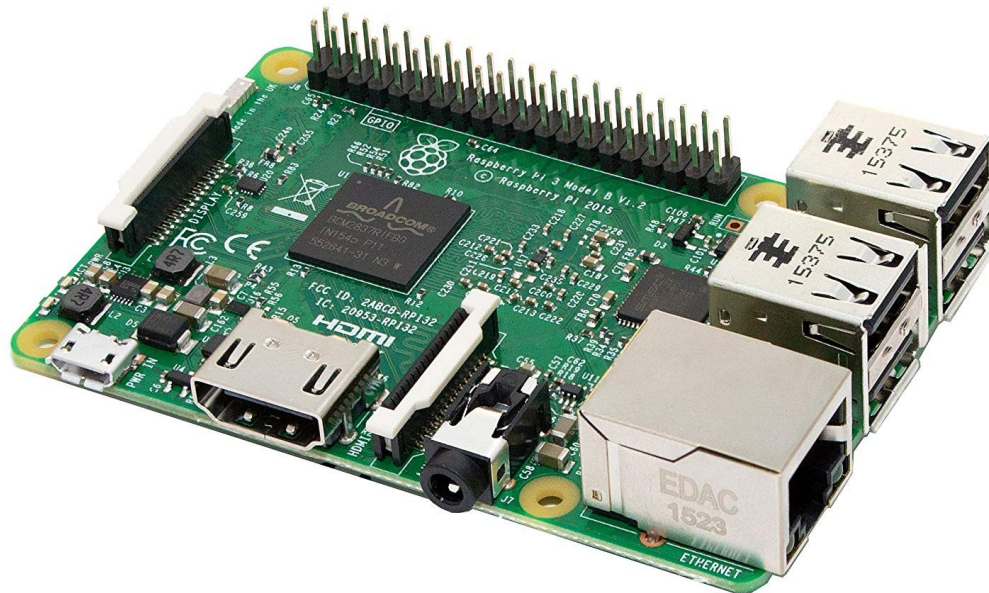
Ali Fele Paranj



# Electronics and Hardware

## The Brain

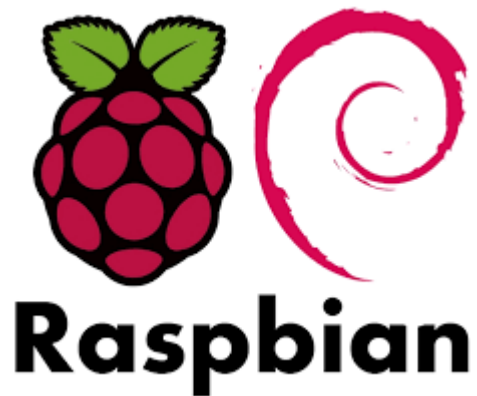
- Microprocessor based on ARM- Cortex A
- Raspberry pi version3 b+



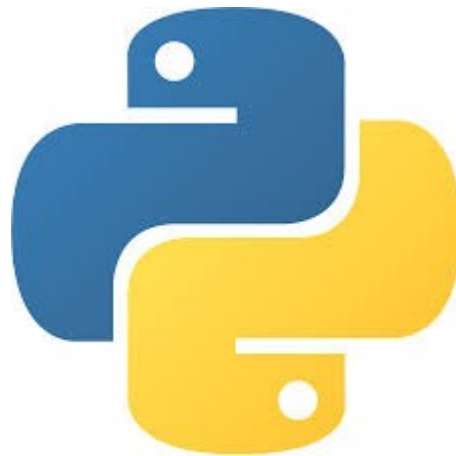
# Software



Linux – Raspbian



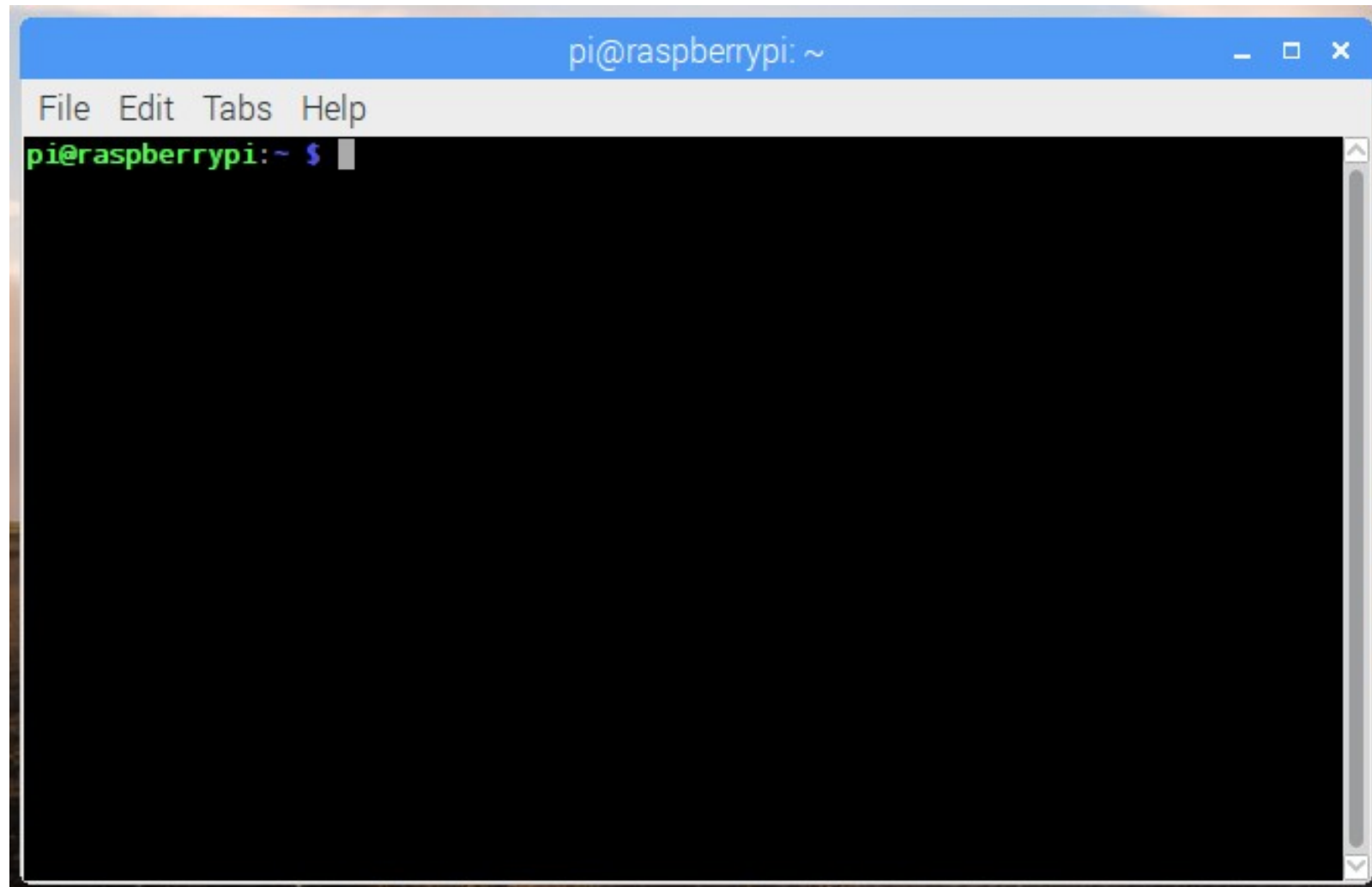
Linux - Armbian



Python



# Command Line Interface

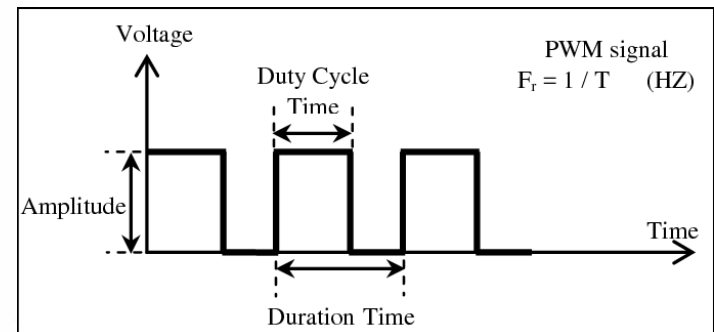


# Electronic Devices

Servo motors as leg



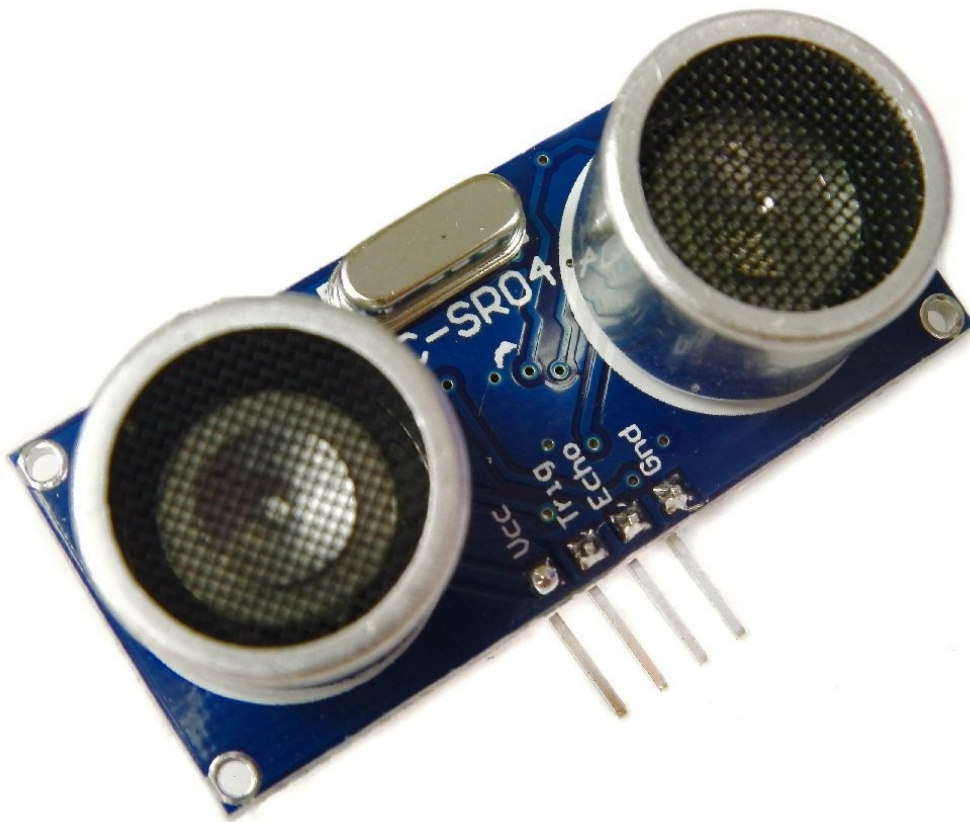
Controlled with PWM  
(Pulse Width  
Modulation)



# Electronic Devices



## Ultrasound Sensors as Eyes



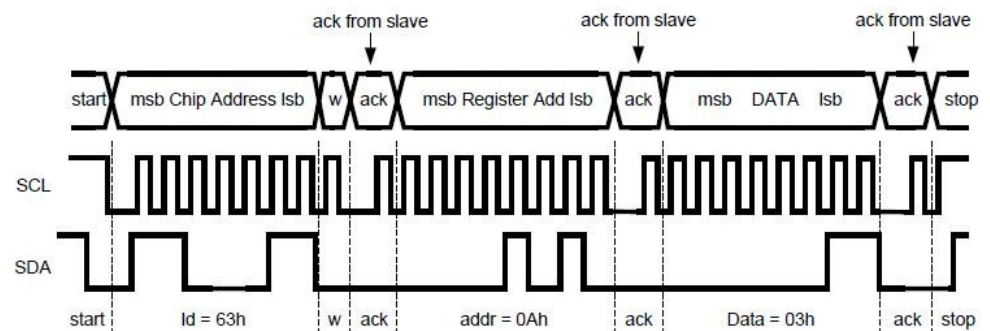
Data logging with interrupt  
Raised by wave trigger

# Electronic Devices

## Gyroscope Sensor for the balance control



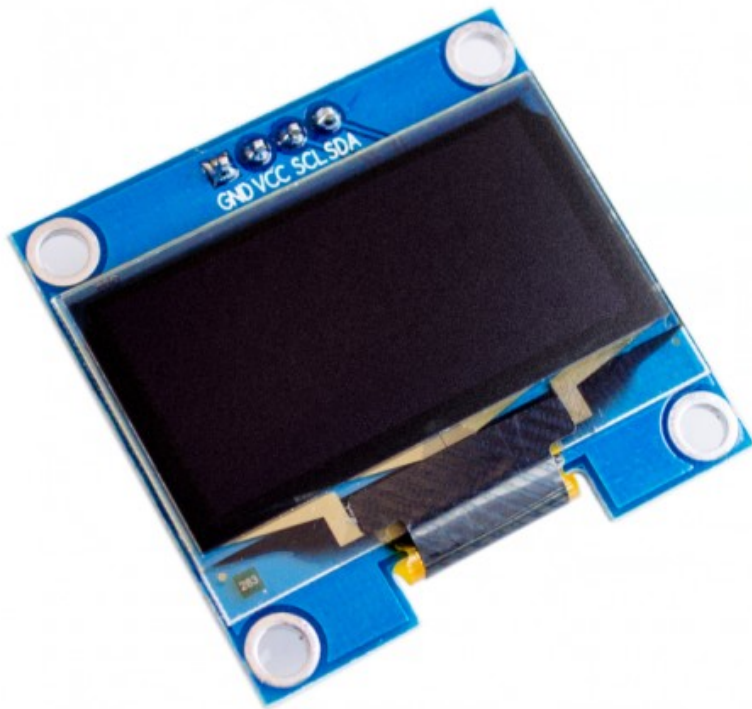
I2C interface with master



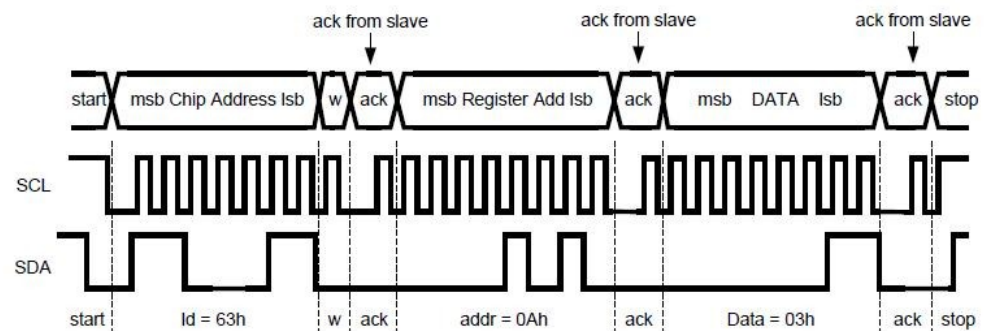


# Electronic Devices

OLED, just a visual option



I2C interface with master





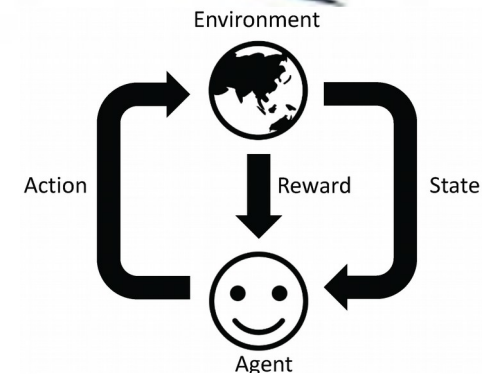
# The assembly



Picture of robot

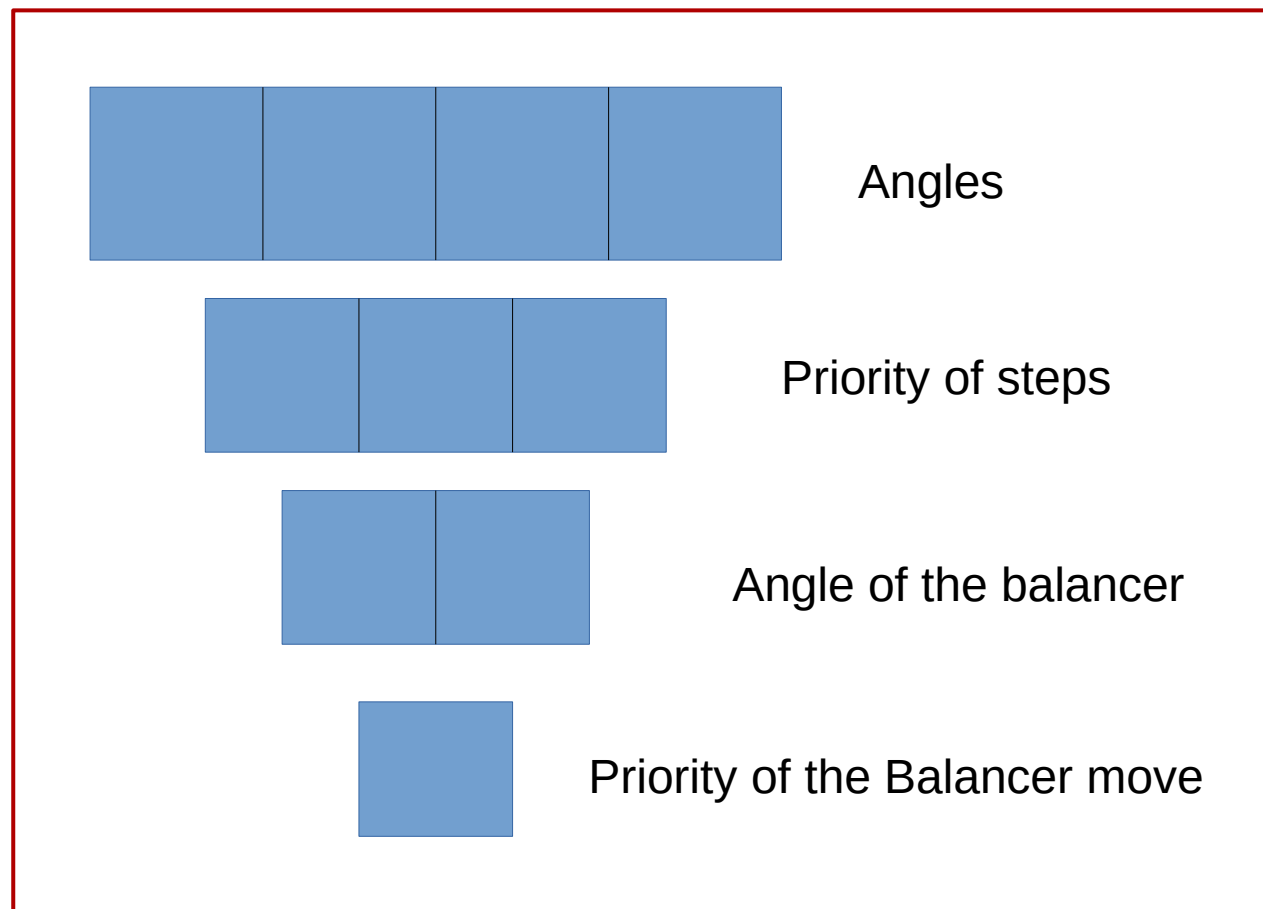
# Algorithms

- Genetic Algorithm
- Reinforcement learning
- Neural Network



# Version I Genetic Algorithm

Coding:

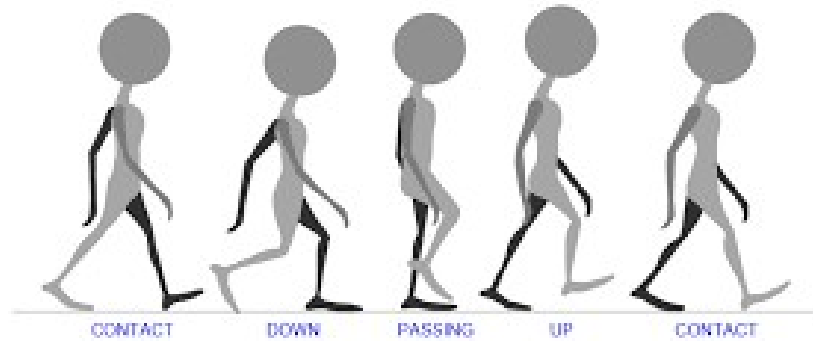


An individual in  
the population

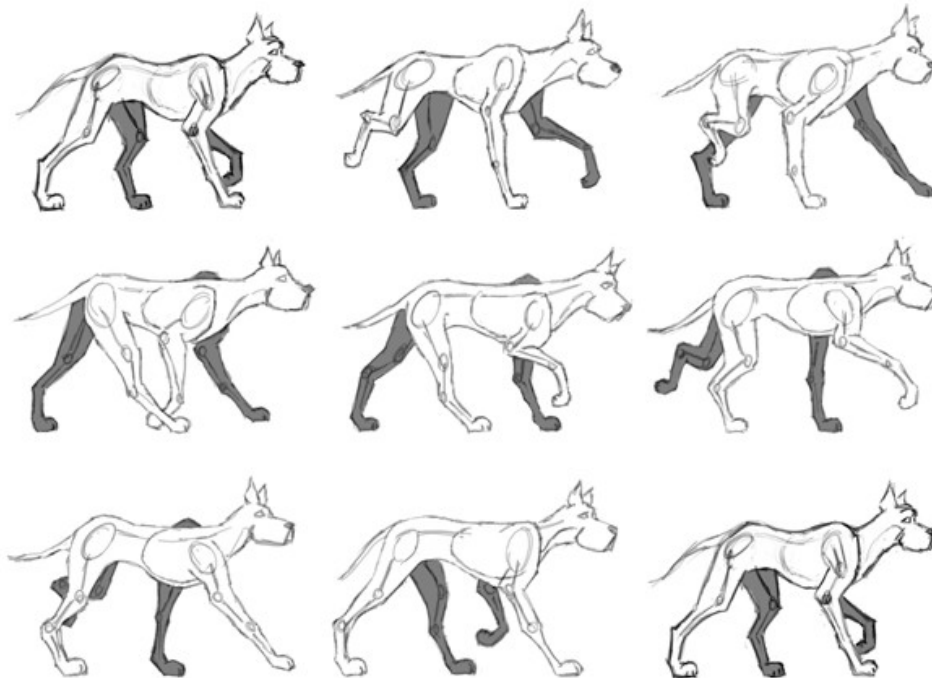


# Fitness Function?!

## What exactly is the walking ?



Walking Cycle for Human

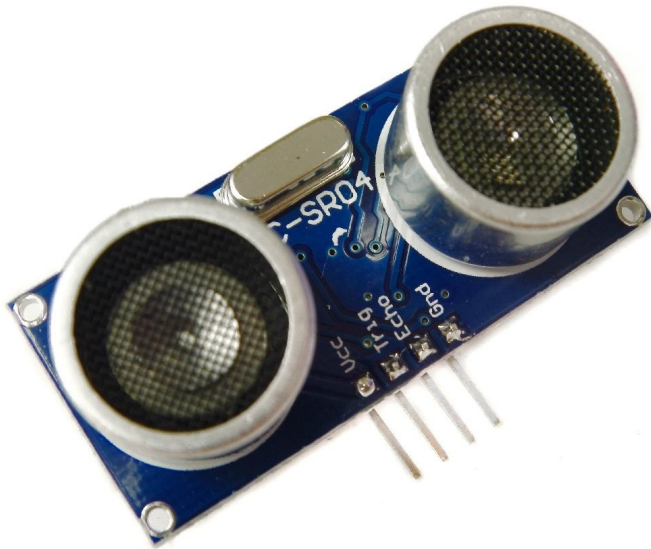


Walking Cycle for animal

# Fitness Function



For Cyclic motion detection



For Positive Move Detection

# Fitness Function



Out put data



DegX, DegY, DegZ

The values of these three angles must be Identical with their values in the beginning of the motion



Out put data



Distance from the goal

I good cycle is the one which is not idle.



Thank you

