

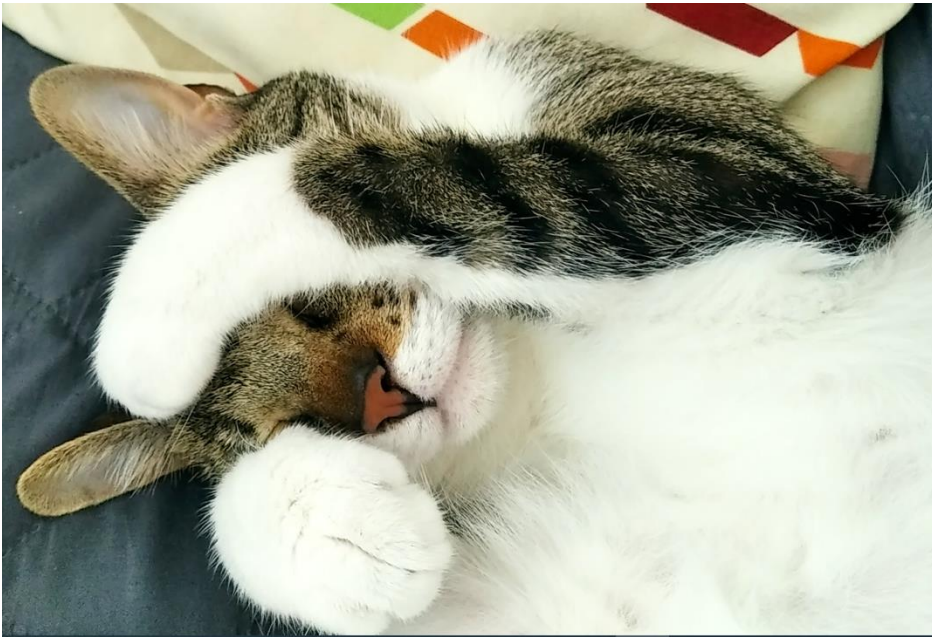


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Castelldefels, Barcelona, Spain. 15/05/2021

The real Kedama cat



Kedama digital twin Robot Requirements

Inputs and outputs



Tangible

Head: Ultrasonic sensor (Input / output)

Neck: Servo Motor (output)

Tail: IR sensor (Input)

Limbs: DC motors (output)

Head: LEDs (output)

Intangible

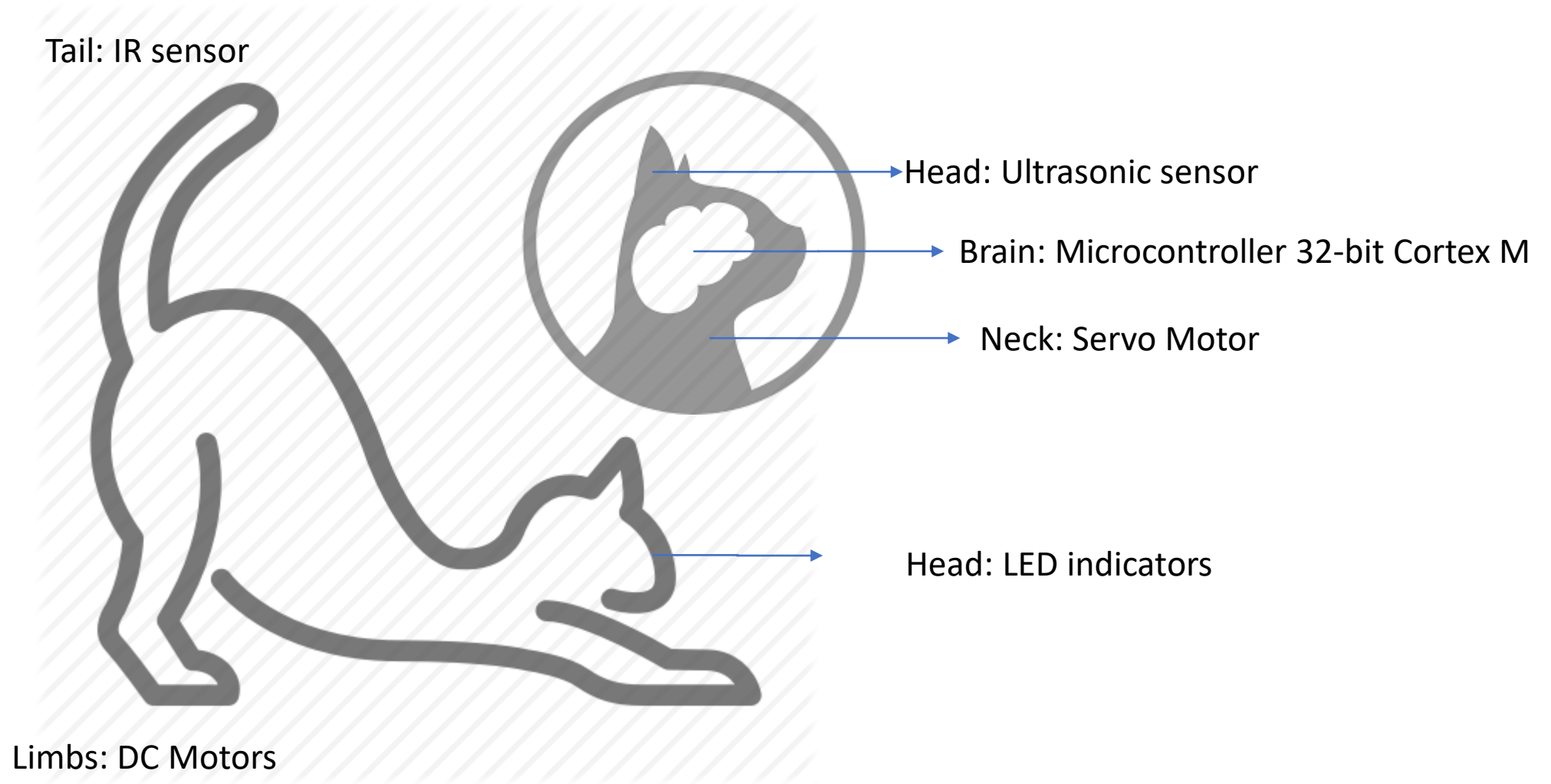
Timing: internal timers and HW interruptions

Light: natural and artificial light detection

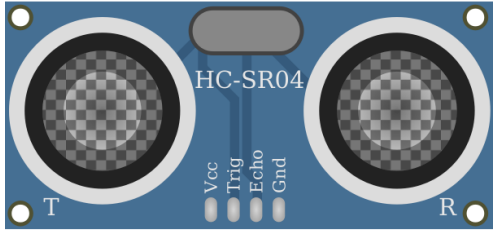
Behavioral robot state: discovering, playing, shy

Eco-location: ultrasonic wave

Robot architecture



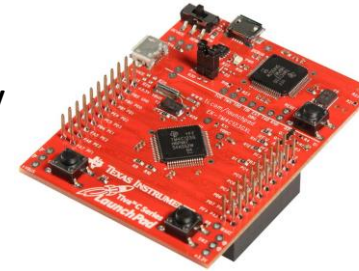
Component and supplies



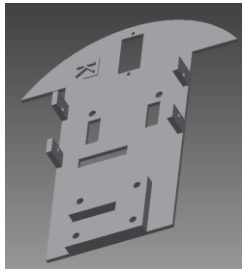
(1 und) Ultrasonic sensor HC-SR04



(1 und) LiPo Battery
3.7V 600mAh



(1 und) Tiva TM4C123G
Launchpad board



(1 und) Robot chassis



(1 und) 3D printed head



(2unds) DC motor 6M12F



(1 und) IR Sensor
TCRT5000

(1 und) Transistor
NPN C945

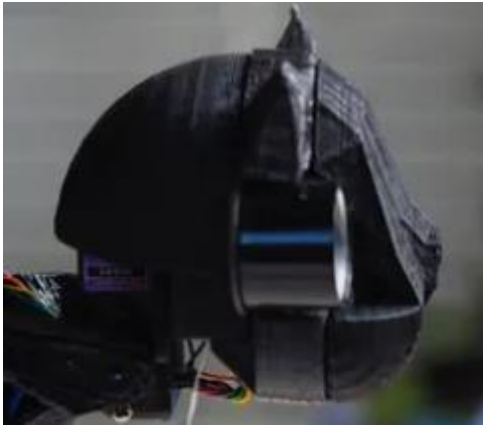


(1 und) caster

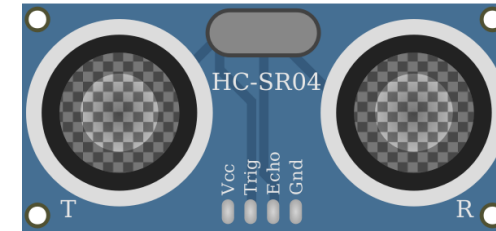


(1und) Servo
motor SM-S2309S

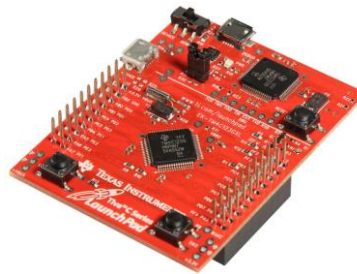
Brain and Head configuration



3D printed head

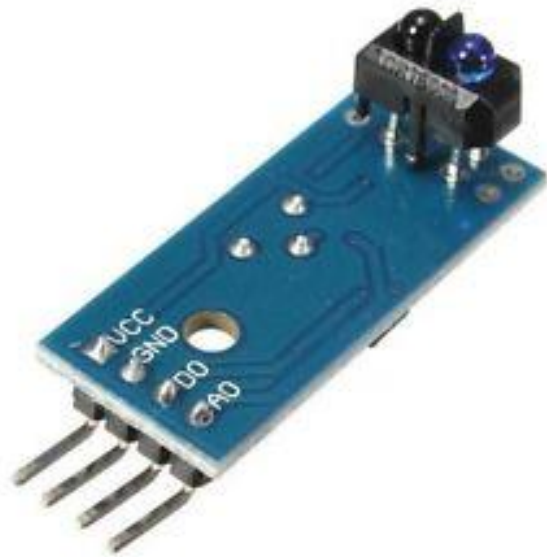


Ultrasonic sensor HC-SR04



Tiva TM4C123G Launchpad board with internal LEDs

Tail configuration



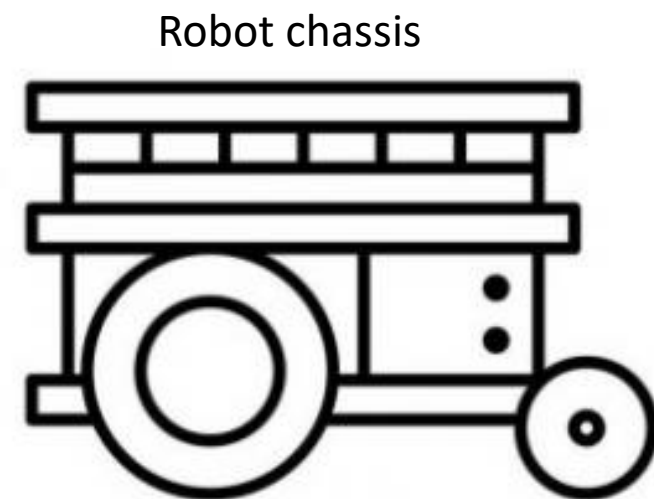
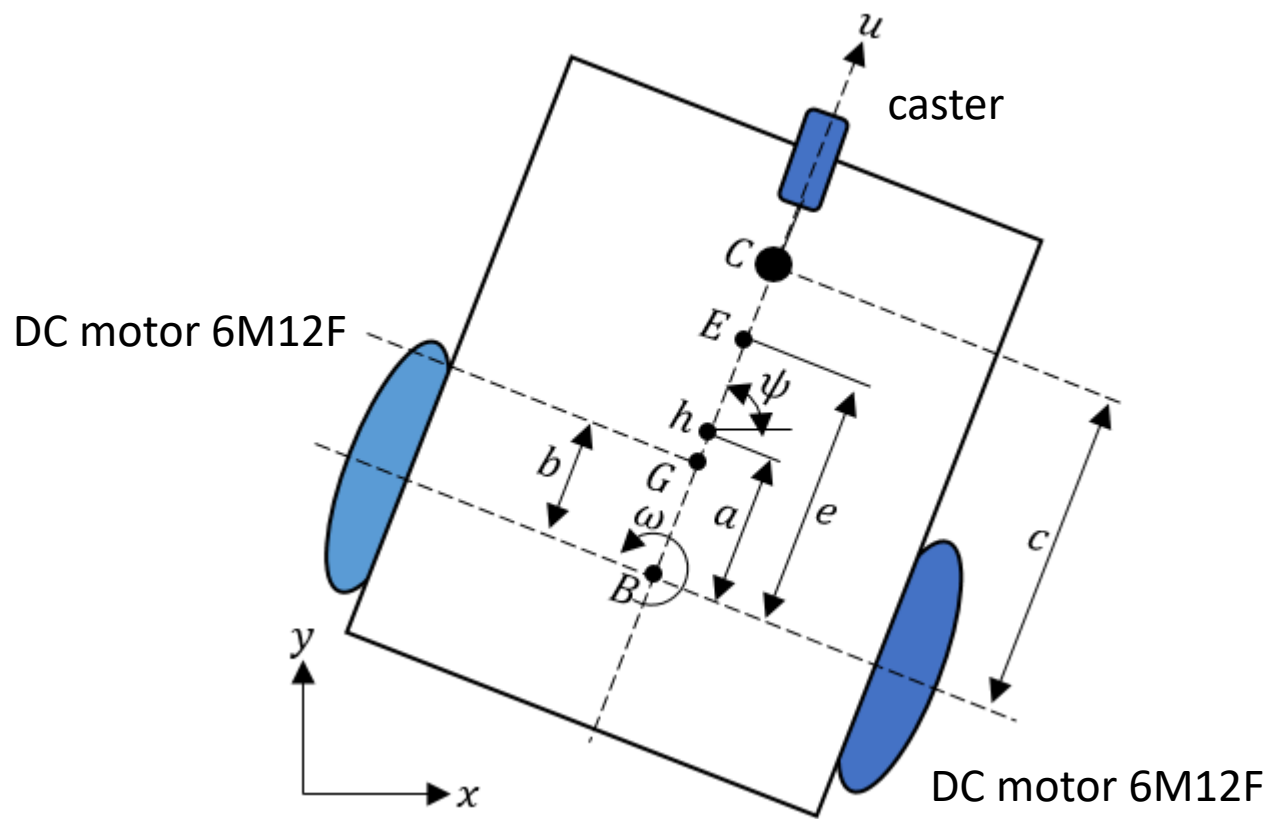
Option A



Option B

IR Sensor TCRT5000

Limbs: wheels configuration

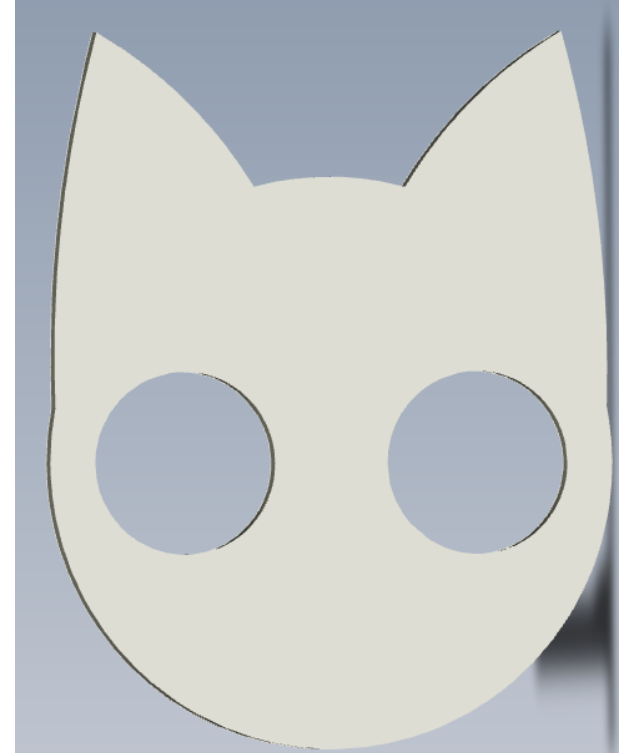
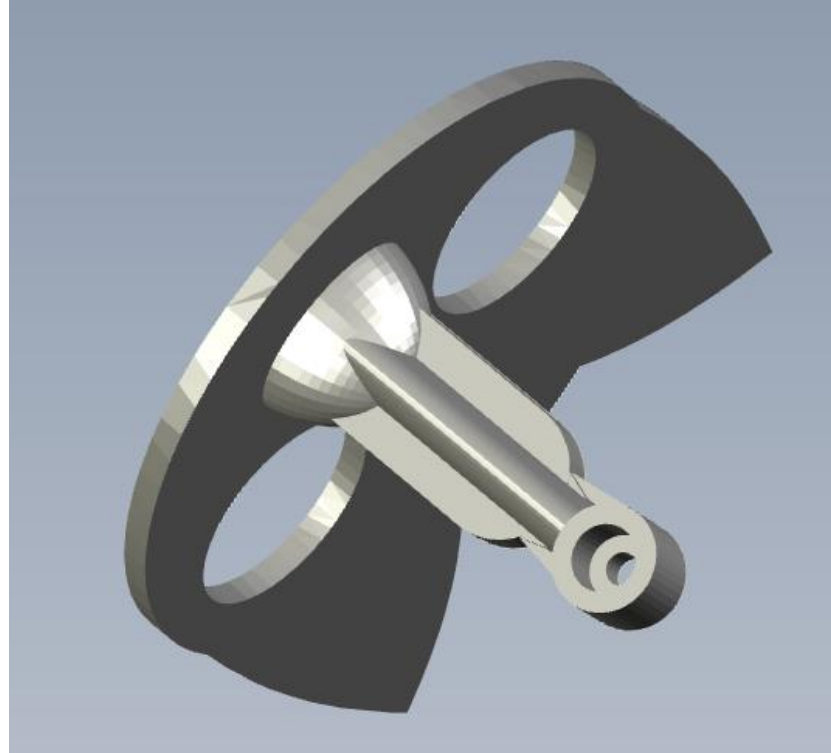
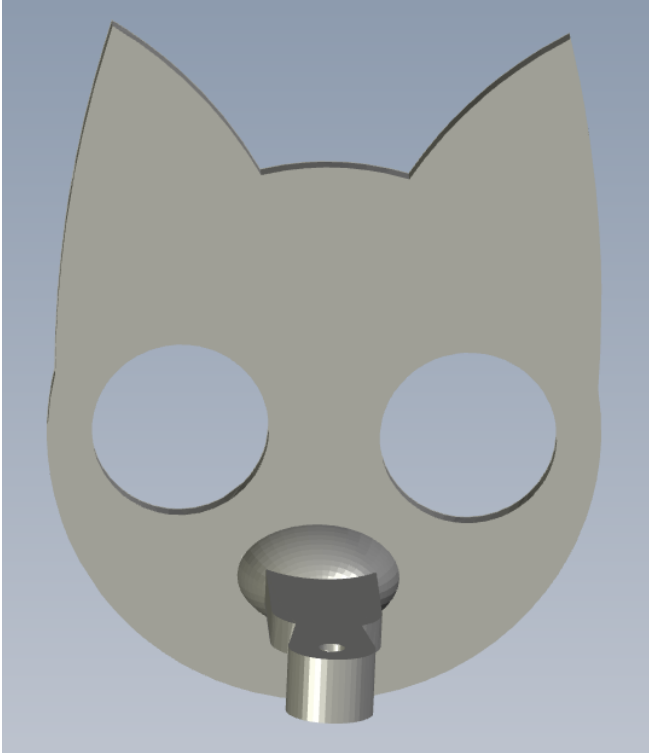


caster

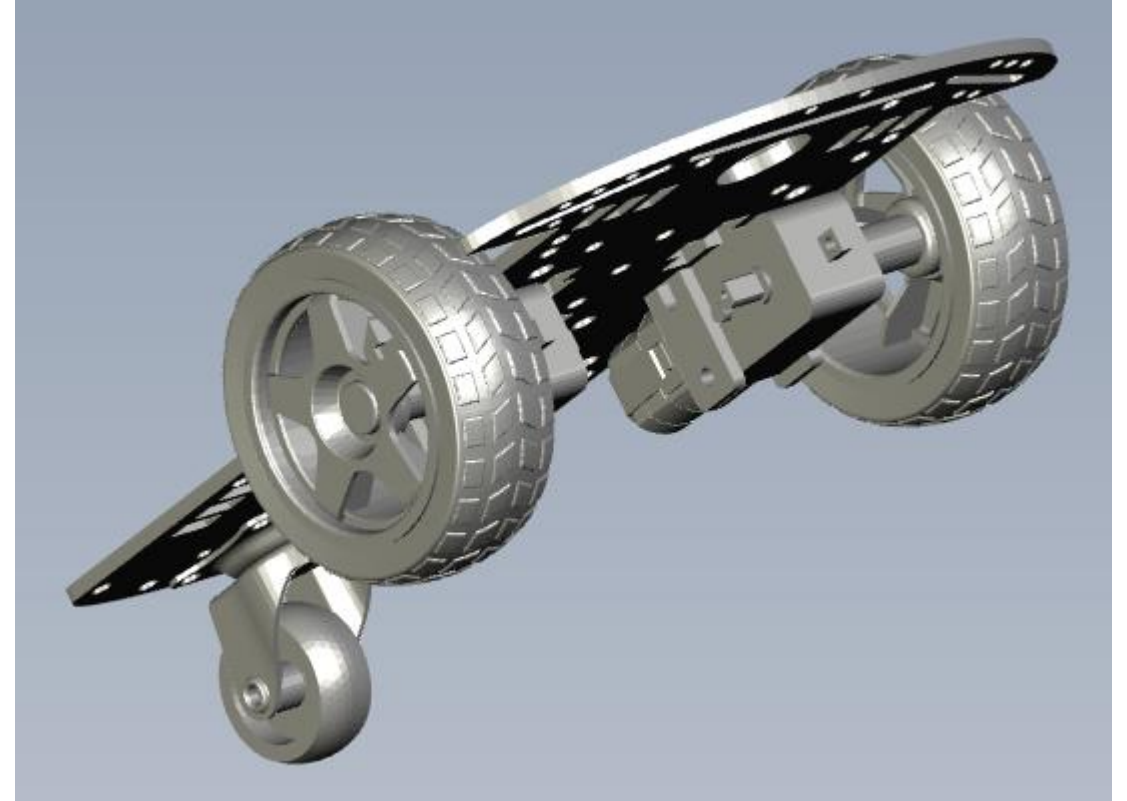
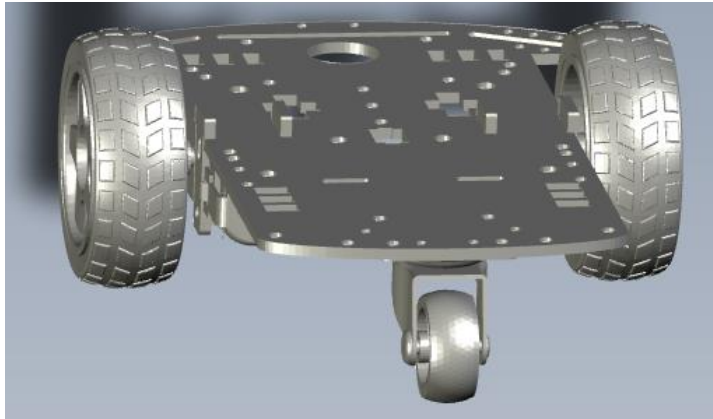
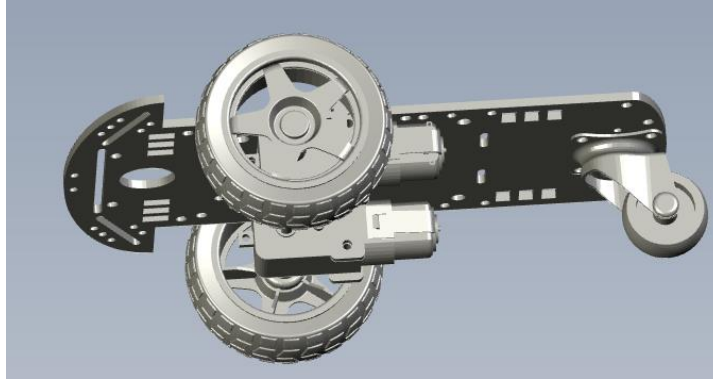
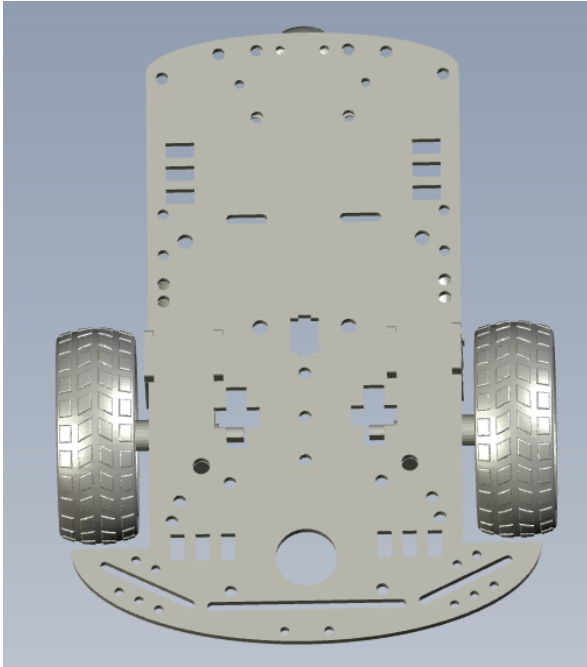


DC motor 6M12F

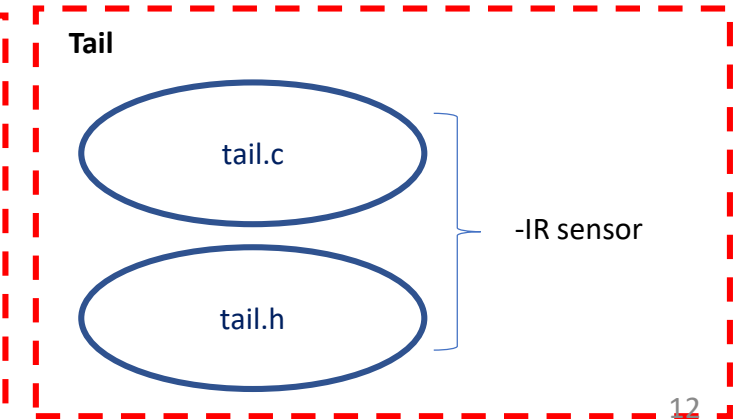
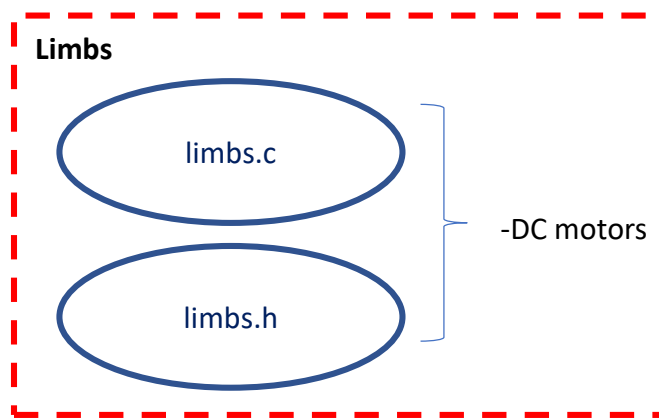
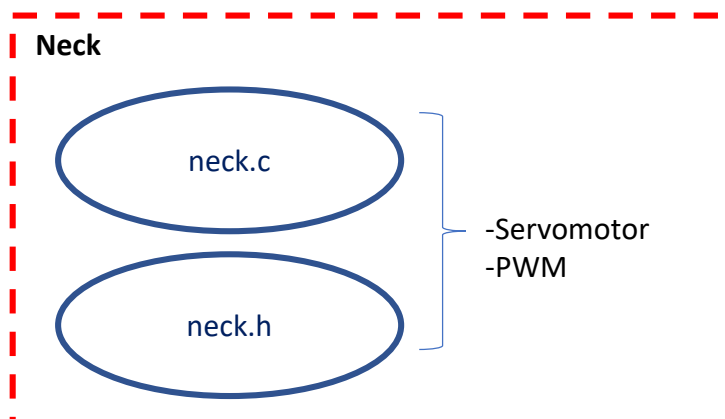
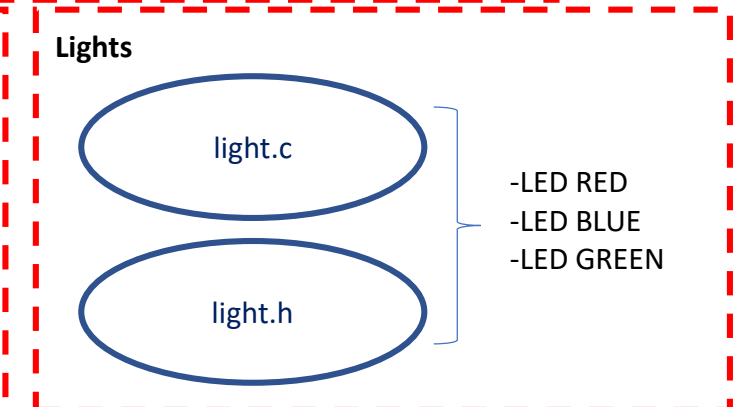
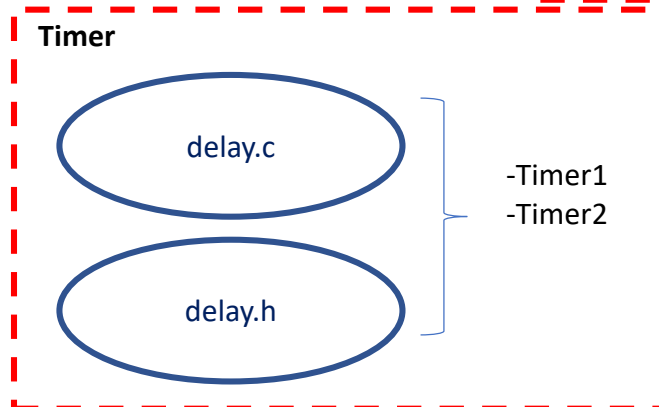
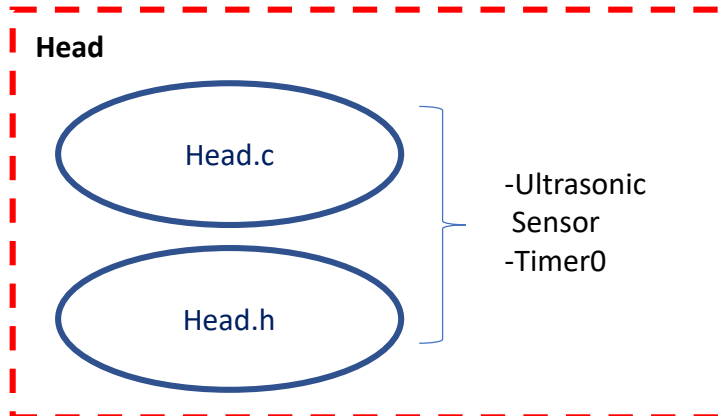
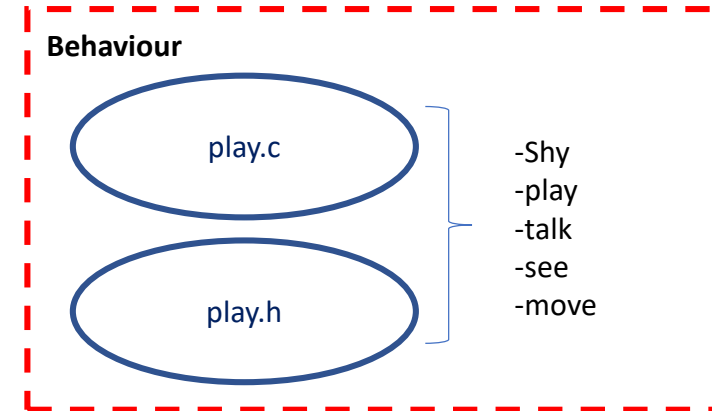
3D printing cat face



3D printing robot chassis



Firmware Modules



Application Flowchart

