# “blackpearl” Robot

In this project, we decided to create a small robot using a microcontroller. Our idea is to build a robot that could do simple movements, detect objects, and stream from a camera. To be able to make this idea come true, we need a microcontroller which controls the robotic hardware like motors or sensors, and at the same time it can also use a camera.

In terms of hardware, we need a microcontroller, “shield”, camera, power bank, and robotics base kit. Based on the recommendation of the professor, we choose Raspberry Pi as the main controller for our project. To build the robot, we need something to structure it. In our case, Lego Mindstorm NXT is a good choice because it is a robot kit for beginners which already provides the motors and sensors. The problem is that we need hardware to connect the Raspberry Pi and the Lego together. Fortunately, we found BrickPi, a Raspberry Pi add-on that lets us control Lego Mindstorm motors and sensors.

Even though Raspberry Pi has the ability to control the servo and ultrasonic sensor, it is not accurate. Therefore, we picked Arduino Uno 3 as another microcontroller to control the servo and ultrasonic sensor.

By default, Raspberry Pi uses Python as the main programming language. Python is a powerful language which can be used to program hardware (Raspberry Pi), network, and website.  Due to that, we utilize the power of Python and the Flask framework to create a website to control the robot. Besides that, we also use Ajax to send the request to the server.

“blackpearl” is an exploration robot which is controlled using wifi connection. The controller could be accessed on both computer and smartphone.