**Mobile Embedded Systems Project Progressive Report**

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In the previous week, we found a display screen to connect the Raspberry Pi board. We decided to use the Python language to implement the distance detection program to drive the ultrasonic sensor, which will be connected to the Raspberry Pi board.

The algorithm for ultrasonic distance detection is not too complex. We just use the formula of speed of sound in the air as the core part in our algorithm. The most challenge part is how to use Python to control the connection between the Raspberry Pi and ultrasonic sensor. With the library ‘wiringPi.h’, we can initialize the ultrasonic sensor and control the input and output of the sensor. We let the Raspberry Pi board send a 10us impulse to the ultrasonic sensor through the Trig pin, and then the sensor start to send ultrasonic wave forward. The ultrasonic wave will return to the sensor when there is any barrier. The time of sending wave and the time of receiving wave will be recorded. Thus, the time difference can be used to calculate the distance from the sensor to the barrier.

We have completed the first step, where the combination of Raspberry Pi and the ultrasonic sensor can detect a distance to a wall successfully. However, our topic is about parking assistance system, so that how to make this distance detection efficient during parking should be a big challenge in next stage. Also in order to perfect our system, multiple points detection and angle detection should be considered in the future.