Unmanned Vehicle using wireless communication system
Project code: SL2-11

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Introduction
With the development of technology, automatic systems are becoming much more popular, in particular unmanned vehicles. For example, we could use this kind of technology in mine sweeping and we hope it will be used in China Lunar Exploration Project (CLEP). Remote controlled unmanned vehicles over a wireless network are the key technology to achieve this target.

Figure 1 unmanned control systems

Sometimes people need to do the task which is very dangerous, they may lose their life when they do this kind of task such as clear of mines, so we need to make use of unmanned vehicle to do it in order to make our life safe. Over the past decades, Unmanned Ground Vehicle and Unmanned Aerial Vehicle have been being introduced. All of these kinds are applied in different areas such as space exploration in MARS by NASA and so on.

METHODOLOGY
A. Research
This process is essential to our project since we need to select the correct hardware components and software to implement and design the project. It also gives us some ideas in design.

We found that Arduino is a good tool which is a single-board microcontroller. It has a lot of open resources. It is also consistent with Atmel AVR processor and on-board I/O port.

B. Simulation
In the project, we will mainly use Matlab for simulation since it includes many different kinds of functions and libraries.

C. GUI implementation
The Graphic User Interface (GUI) is made for users to draw paths and send the coordinates to the vehicle. Then the vehicle moves along the curve immediately.

D. Narrow the errors of the PID controller.
Since we know that there is delay between the vehicle and computer, the tool (PID controller) is quite important for us to narrow the error and make it become more stable.

1. A user needs to add some points on the drawing zone of the GUL
2. The GUI will automatically draw a straight line passing two points.
3. Press the “Move” button, data will be transmitted to the model car. Then the car moves along the curve.

Figure 1 GUI interface

Figure 2 GUI interface for data collection