**Minutes of the Telecommunication Engineering and Management Program meeting on conducting the creation of an Arduino cart (group)**

In the middle of the project, our group held a meeting about making Arduino car. In the meeting, the teachers of various majors answered all the problems encountered by the students in their study life. The leader of the group firstly explained the process of making Arduino car and answered all the questions encountered by the students in the process of making it. At the same time, he explained the main functions of Arduino car, the principle of the circuit, the preparation of materials and the process of building it, and emphasized that we should have patience to do everything, and we should be careful in the process of making it, and we should make every detail perfect.

**I. Introduction**

Arduino is an open source hardware which is based on ARMCortex-M3 core and is written in C. It can be used with various other computer systems and peripherals.Arduino can perform a wide variety of tasks.It is programmed using a programming language similar to C.It can be connected to the hardware to perform various functions.Arduino can be connected to different external devices such as infrared sensors, cameras, LEDs, etc.Arduino uses C to write programs to implement the control and communication functions of these external devices. Arduino can be connected to different external devices such as infrared sensors, cameras, LEDs, etc. Arduino uses C to write programs to implement the control and communication functions of these external devices. The Arduino can be connected to a computer through a USB port or through a serial port. Serial communication is performed in the serial port using the Profinet connection cable provided by Cypress. Communication, debugging, and modifications can be easily performed using Profinet. Arduino has a folder named "Host", the contents of which include the system configuration information, bootstrap program and instruction manuals, etc. Arduino uses BSD source code, so we are free to modify the software source code of any file, even if there are some errors or incorrect places in the source code, do not worry, because the source code is not correct. Even if there are some mistakes or incorrect places in the source code, we don't have to worry about it, because it is very easy to modify the BSD source code. Since the BSD source code has high confidentiality, we can't tell it to others easily. Arduino programming requires writing various commands to realize different functions. Each command has its own unique meaning, so we should pay special attention when writing commands to avoid misunderstanding. For example: Arduino has a string dedicated to displaying the current temperature. When we are writing this command, we should pay special attention to whether the temperature value it indicates is the current temperature value (e.g. -30℃). When we are writing the temperature control, we have to pay attention to whether it is the current temperature value (such as -30℃); if it is, it means that the temperature control command has not been executed successfully; if it is not, it means that there is an error during the execution of the command (e.g. there is an output error in the code), then it means that there is an error during the execution of the command. There is another important command in Arduino, namely "current", which is used to save the current running time when Arduino is running. Since we can't save the whole program, we have to re-call it every time we run to save the current running time (e.g. 5s), this process is called "current". Since we have to call it again to save the current running time (e.g. 5s) every time we run, we have to pay special attention to whether the time it indicates is the correct time. If it is, an error occurred during the execution of the command; if it is not, no error occurred during the execution of the command. This string shows the difference between the current temperature value and the previously set temperature value, not the temperature itself. We can think of this string as a "virtual temperature value". This "virtual temperature value" can also be set in other ways.

**II. Problems and solutions encountered in the building process**

1, the circuit module construction problem: in the construction, we found a part of the module power supply voltage is low, while the other part of the module power supply voltage is high. For this problem, we adjusted the voltage of the part with high power supply voltage to make it consistent with the power supply voltage. 2, wire welding problems: in building the car, found that some wires are not firmly connected. For this problem, we polished the welding point of the wire connection. 3, circuit components welding problem: in the circuit components welding, due to the long welding time led to component oxidation, affecting the subsequent welding work. In response to this problem, we have oxidized some of the components. 4. Program writing problem: When writing the program, we found that there were bugs in some of the programs, and we corrected these bugs. When writing the program, we noticed that some modules could not realize the switching of two states, for this reason we optimized the code so that it could realize the switching of two states. 5. Battery problem: When installing the battery, it could not be charged properly because the battery was not firmly installed. For this problem, we fixed the battery in the correct position; at the same time, we charged the battery; so that it can be charged normally. 6、System test problem: In the system test, we found that each module and program can run normally, but cannot display the current running status. For this problem, we have upgraded the software of each module; at the same time, we have optimized the program code; so that it can display the current running status normally. 7, the car forward, backward problem: the car forward in the dead phenomenon. To address this problem, we will part of the circuit module for the transformation; in the control mode used in the wireless mode; at the same time, the drive module and control module for modification. 8、Wireless communication problem: the data transmission is not stable when using Bluetooth for communication. To deal with this problem, we upgraded the firmware of the Bluetooth module; at the same time, we re-encoded the received data information and then transmitted it; finally, we added a decoder at the receiving end to decode the data information and then transmitted it to the microcontroller. 9. Sound detection problem: We found that the sound detection function could not be used normally when making the car. For this problem, we upgraded the sound detection module; at the same time, we optimized the hardware code of the control module; finally, we recoded the software code of the control module and then transmitted it to the microcontroller. 10、Wireless transmission problem: data loss occurs when using the wireless transmission function. 11、Program debugging problem: unstable program operation occurs during the production process.

**III. Reflections on problems encountered**

Learning Arduino is a very meaningful teaching software, learning Arduino can not only master the core knowledge of Arduino, but also learn more technology, by making a small car, you can not only improve your hands-on ability, programming ability, logical thinking ability, but also cultivate your patience, perseverance and team spirit.