In the portfolio introduction, I will introduce each work in the portfolio in numbered order.

1. certificate of honor

2021.5. The second prize of the Party History Knowledge Contest of Harbin Institute of Technology

2021.12. HIT University-level Outstanding Student (Moral Cultivation Award)

2022.3. Excellent Officer of Youth League Committee, School of Telecommunications, HIT

2022.6. Third place of the first Intellectual Games of HIT

2022.8. Third Prize of Huashu Cup National College Students Mathematical Contest in Model

2023.5. Third Prize of Undergraduate Group A in Heilongjiang Province, Datang Cup National Information and Communication Technology Competition for College Students

2023.5. Runner-up of the Third Smart Games of HIT

2. Report of using C to complete mine sweep game design

Use C language to design a minesweeping game, containing background music, can complete the start of the game, exit the game, check coordinates and other minesweeping game basic operations. The interface is neat and beautiful, the program ensures integrity and robustness, and focuses on user experience.

3. Research on CCSDS spatial link layer protocol identification technology based on ensemble learning

Based on the study of CCSDS system, this paper mainly studies the AOS protocol, TM protocol and TC protocol of CCSDS link layer, and studies their structure andfunction. It focuses on how to identify these protocols more accurately bycomparing the fields of these protocols and referring to the research of communication protocol identification methods in other literatures. In addition, this paper also studies a variety of protocol recognition technologies, including machine learning technology and ensemble learning technology, and explores their principles and advantages and disadvantages for protocol recognition. In the process of implementing the link layer protocol identification system, this project first constructs the environment of protocol identification and the database that can reflect the protocol fields, then adopts three classical integrated learning algorithms, namely random forest algorithm, Adaboost algorithm and GBDT algorithm, to build the model, and adds certain interference factors to the data set. Finally, In this experiment, F1-score evaluation index was used to test the accuracy of the identification protocol model. By gradually adding noise, it was finally determined that the random forest algorithm had better performance in this environment.

This project uses python language programming, and uses integrated learning and machine learning methods in artificial intelligence.

4. Report of using Labview to complete the snake game design

This project uses the graphical programming language labview to complete the design of Snake software, which mainly consists of three parts: game interface initialization, game operation control and winning judgment; The project can realize the movement of greedy snake, and the game interface can change the color of interface, snake body and snake egg; Can choose "easy" to "devil" five game difficulty, can display the snake head, snake body, snake egg at any time data; If the snake head touches the snake body or interface boundary, the game ends.

5. Communication signal analysis and processing

This project is about three experiments on random process analysis of communication signals, MATLAB is used to complete the simulation. The three experiments are the time domain feature analysis of stationary random process, the frequency domain feature analysis of stationary random process and the time domain and frequency domain feature analysis of random process after passing the system.

6. The application of probability theory in life

This article uses the knowledge of probability theory learned in the course to briefly introduce some application of probability theory in daily life. Probability theory can solve some common problems in life, such as the analysis of lottery problems using classical probability; The normal distribution is used to analyze the achievement problem; mathematical expectation is used to analyze lottery problems; variance is used to analyze the shooting problem.

7. College student innovation project 'smart flower pot'

Used the hardware description language Verilog for programming, and used hardware such as the STM32 microcontroller, DHT11 temperature and humidity sensor, Arduino development board, and GY-30 light intensity sensor to support the functions of the flowerpot.

Made a flowerpot that can monitor environmental conditions such as temperature, light intensity, and humidity, as well as added the function of adjusting light intensity and humidity to improve the practicality of the flowerpot.

8. Design of transmitting and receiving system for medium wave radio station

This project is designed to transmit and receive AM communication signal system, which is divided into two independent and related subsystems of transmitting system and receiving system. The function of the transmitting system is to modulate the voice signal or other signals as a modulated signal and transmit them out. The input signal is a voice signal, and the output signal is a signal with certain performance requirements. The function of the receiving system is to recover the baseband signal from the AM modulated signal transmitted by the transmitter. That is, the input is an AM modulation signal, and the output is a baseband signal.

This project uses multisim software to complete circuit simulation, and uses the knowledge of high frequency circuit.

9. Internet of Things communication technology and application

This paper briefly summarizes the Internet of Things communication technology. The Internet of Things communication technology is one of the core technologies to realize the Internet of Things, which covers wireless and wired communication technologies for connecting and transmitting various devices and data. With the rapid development of Internet of Things technology, Internet of Things communication technology is also constantly evolving and innovating. With the integration and application of artificial intelligence, big data and other technologies, the application scenarios and intelligence level of the Internet of Things will also be further expanded and improved. In the future, we expect to see the emergence of more innovative applications and solutions to drive the further development of iot technology and social progress.

10. Simulation of non-real-time service scheduling algorithm

Through the implementation of different scheduling algorithms, this project deeply understands the key scheduling concepts and technologies in wireless communication systems, and establishes the understanding of the theoretical and practical knowledge of scheduling algorithms. This project evaluates the performance of different scheduling algorithms, collects and analyzes the performance data, and selects the scheduling algorithm suitable for specific application scenarios by comparing the performance of different algorithms.

11. LTE long-term evolution technology

This paper studies the formation background, evolution process, technical indicators and several key technologies of LTE long-term evolution technology, as well as the existing problems of LTE and its impact on the future development of communication technology.

12. Timer doorbell designed by proteus

This project design needs a buzzer and a switch, and then with the corresponding software can be realized. When the software is designed, a timer is used to control the buzzer to simulate the ringing of the ding-dong door. The ding sound is formed at a higher frequency with a shorter timing, and the dong sound is formed at a lower frequency with a longer timing. The simulation circuit is added to the virtual oscilloscope, and in addition to hearing the doorbell when pressing the key, the different pulse widths of the two sounds are observed from the screen of the virtual oscilloscope.