# Ziheng Ding

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## EDUCATION

**Bachelor of Computer Engineering**　　　　　　　　　　　　　　　　　**Sept. 2019 – Jun. 2023**

School of Engineering (SENG), Hong Kong University of Science and Technology (HKUST)

- Cumulative GPA: 3.342/4.3
- Core Modules: Object-Oriented Programming and Data Structures: A; Electronic and Information Technology: A; Introduction to Electro-Robot Design: A+; A System View of Communications: From Signals to Packets: A

## RESEARCH EXPERIENCES

❖ **Course Projects:**

➢ **Design and implementation of an autonomous tracking car**　　　　　**Mar. 2020 – Apr. 2020**

Supervisor: Prof. Murch Ross

- Finished the logic and programming part of the design of a robot car which was expected to be able to complete the tasks including going along the track, choosing the correct split to go, turning in the 90 degrees angles, and stopping at the end; did the troubleshooting and completed the demo successfully
- Adapted the car to different road conditions, including straight lines, arcs, forks, and sharp turns; made sure the car was moving smoothly on most occasions though it got stuck in a sharp turn
- Found out the essence problem underlines the car's failure in crossing the sharp turn, token the limitation of the car sensor into consideration and adopted differentiated steering (used different motor speeds on wheels of each side of the car when cross the sharp turn) in the troubleshooting

➢ **Design and implementation of a propeller car**　　　　　　　　　　**Mar. 2021 – Jun. 2021**

Supervisor: Prof. Ting Chuen PONG

- Designed a car that was driven by two propellers and was able to advance and turn
- Remotely controlled the car by an app on my smartphone and established the connection through the Bluetooth
- Overcame the major obstacles of the work, the limitation of power and material, by the utilize of bearing and balanced the load on wheels; improved the car's performance. Figured out that because the power provided by propellers was weak, the car must be constructed with light enough materials and have as less friction as possible.

➢ **Design and implementation of an Omni-directional Quadruped Robot**

**Oct. 2021 – Nov. 2021**

Supervisor: Prof. Vinod Prasad

- Finished the designment of a 3D-printed robot that meets the expectation of moving omnidirectionally without turning its body.
- Used UCOSIII real time operating system on STM32 board to control 12 servo motors with three motors on each leg.
- Worked on CPU clock scheduling and multi-threaded processing; built the logic of the control algorithm based on gait analysis to make the 12 motors move synchronously to complete a smooth movement.
- Decided the algorithm's step size is at the beginning of each movement depending on the angle of the movement relative to the starting location; did repetitive tests to meet the project's requirement

➢ **Path-search algorithm design**　　　　　　　　　　　　　　　　　　**Apr. 2022**

Supervisor: Prof. Fangzhen Lin

- Finished the path-search algorithm design with the aim to determine the shortest route from two random places to their respective endpoints in a 256x256 obstructed map scene in less than one second
- Within the scenario containing two agents, used bidirectional A* in the code implementation to save computation and meet the computation time limit.
- The trigger decision of re-route finding was designed so that when the distance between two agents falls below a certain threshold, the path would be recalculated after each move to avoid collision

❖ **Machine Learning on Wearable Devices/Supervisor: Prof. Hui Pan**      **Jun. 2021 – Aug. 2021**
- ➢ **Interaction between users and programs on wearable displays through hand gesture recognition**
  - Responsible for studying the relationship between the number of IMUs and the complexity of hand pose; established recognitions as follows:
    - a) I found that static gestures could be successfully recognized despite that sometimes the program may be confused among them. In signal modulation, different signals could be transmitted in different phases simultaneously.
    - b) However, when more signals are transmitted, signals become more similar to each other in their phase and "cluster", which means it becomes harder to distinguish signals and an increasing error rate for decoding the signal.
    - c) This also indicates a tradeoff between the number of gestures commanded and recognition accuracy: if more gesture is defined, surely the system would be able to perform more sophisticated functions, but it also leads to an increase in similarity between gestures and lower accuracy.

## WORK EXPERIENCE

@ **Ant Yunchuang Digital Technology (Beijing) Co., Ltd**      **Jun. 2022 – Aug. 2022**
**Ant Group - Payment Business Group - Technical Division - Industry Technology Department**
**Intern / App development**
- Participated in the creation of the hotel template for the CMO program
- Developed within the framework to offer live-in services, such as instant Wifi connection, invoicing reservation, and personal identity verification by scanning QR code.
- Capability of displaying a range of basic information, including the hotel's name, location, and contact information. ISVs and retailers may use the template's advertising slots and discount insertion areas.
- Undertook the work of communication in cooperation with other departments

## SKILLS

- ✓ Programming: JAVA, C++, C, Python, Matlab, Spring, React Native, XGBoost, JavaScript, CSS
- ✓ CAD drawing: Soildwork
- ✓ Hardware: STM32, Arduino
- ✓ Basic knowledge of computer architecture, operating systems, signals and communications, networking, data structures, AI, electronic components, etc.

## ACADEMIC INTEREST

My learning field mainly focus on computer technologies, including hardware, software and theories, etc. I have a strong passion and interest in system design and aim at developing new technologies from advance theories in my future career.