Attachment

I Some research during the CUHK, HONG KONG (2021-2022)

1.1 Related projects of The Chinese University of Hong Kong

Paper: 6-D Spatial Localization of Magnetic Actuated Capsule Endoscopes (WMACE) Based on the Fusion of Hall Sensors Array and IMU (Preparing)

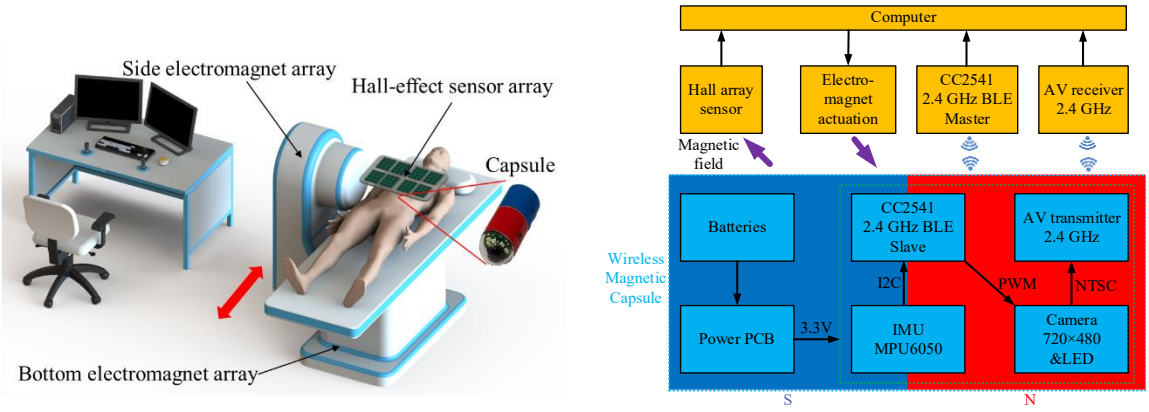

Fig 1.1 Electronic system architecture diagram of the WMACE

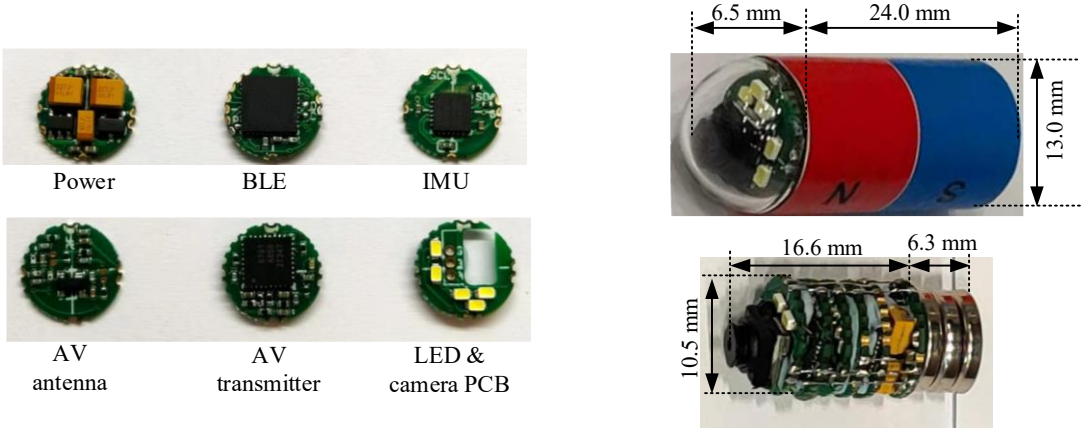

Fig 1.2 Wireless magnet capsule design (done by myself)

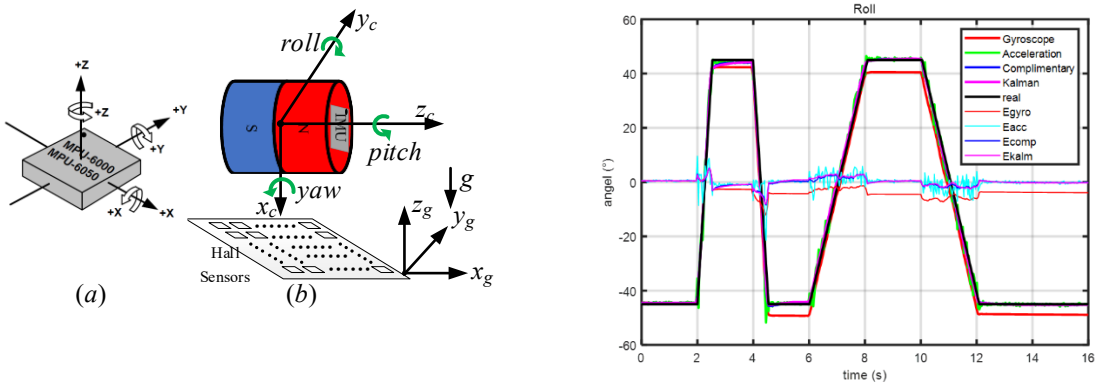

Fig 1.3 Magnet localization and orientation (done by myself)

II Some research during the master's period (2017-2020)

2.1 Related projects of The Chinese University of Hong Kong (Shenzhen)

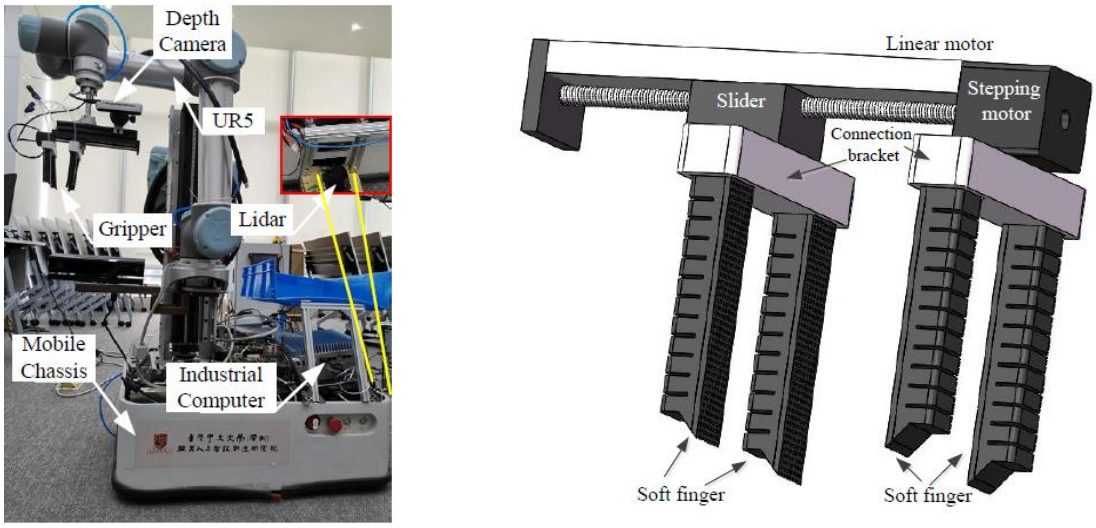

Fig 2.1 Soft gripper with automatically adjustable finger spacing for robot

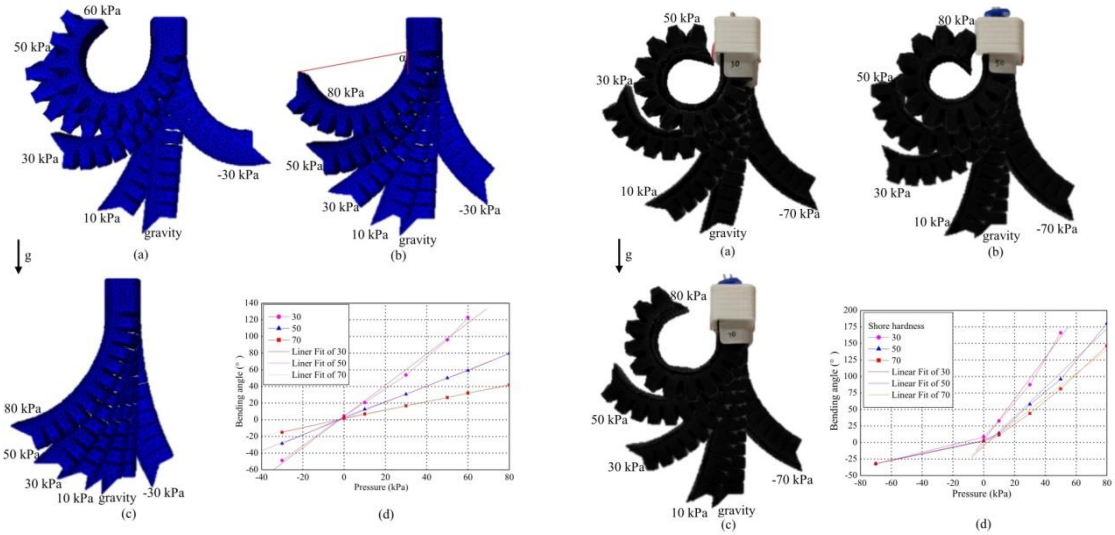

Fig 2.2 Finite element analysis and practical testing of pneumatic fingers at different Shore hardnesses (done by myself)

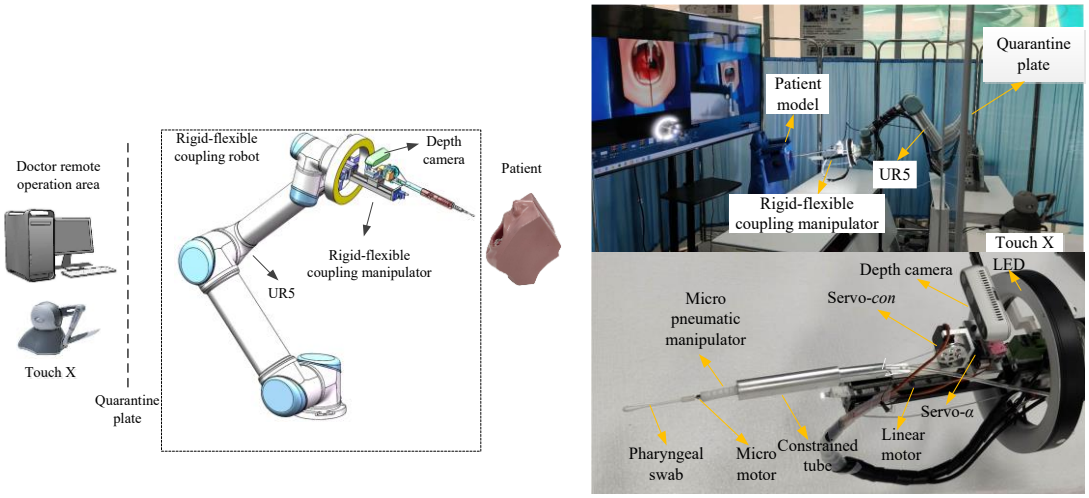

Fig 2.3 Pharyngeal-swabs sampling robot

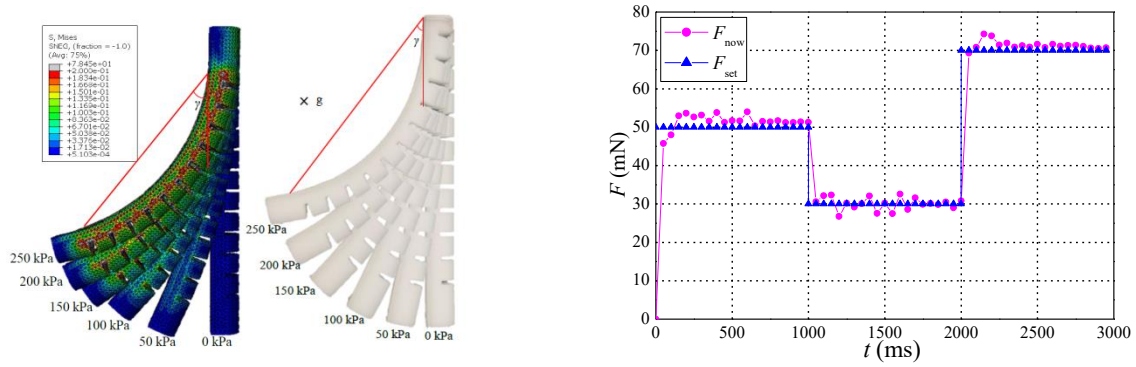

Fig 2.4 Finite element analysis, experiment and constant force control (done by myself)

2.2 Related projects of Taiyuan University of Technology

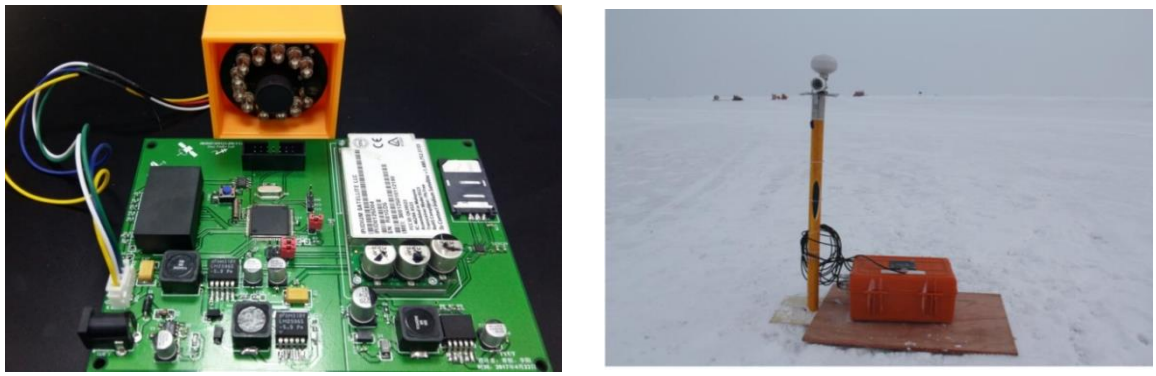

Fig 2.5 Remote real time monitoring equipment for polar images (done by myself)

Fig 2.6 Unmanned ice station

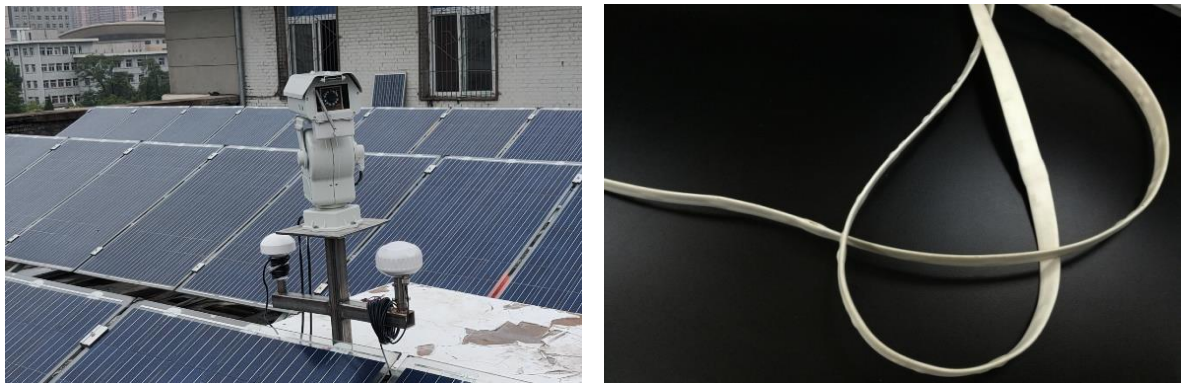

Fig 2.7 Polar image remote real-time monitoring equipment & Flexible platinum resistance temperature chain. (done by myself)

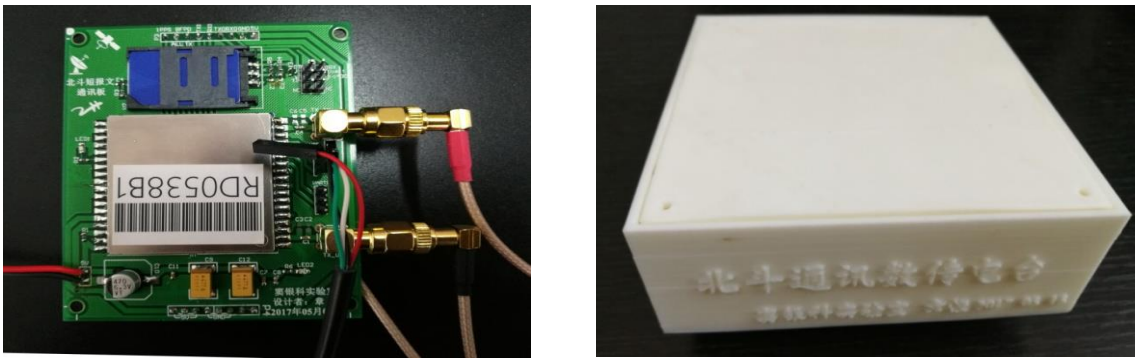

Fig 2.8 Beidou data transmission controller (done by myself)

Fig 2.9 Polar buoy

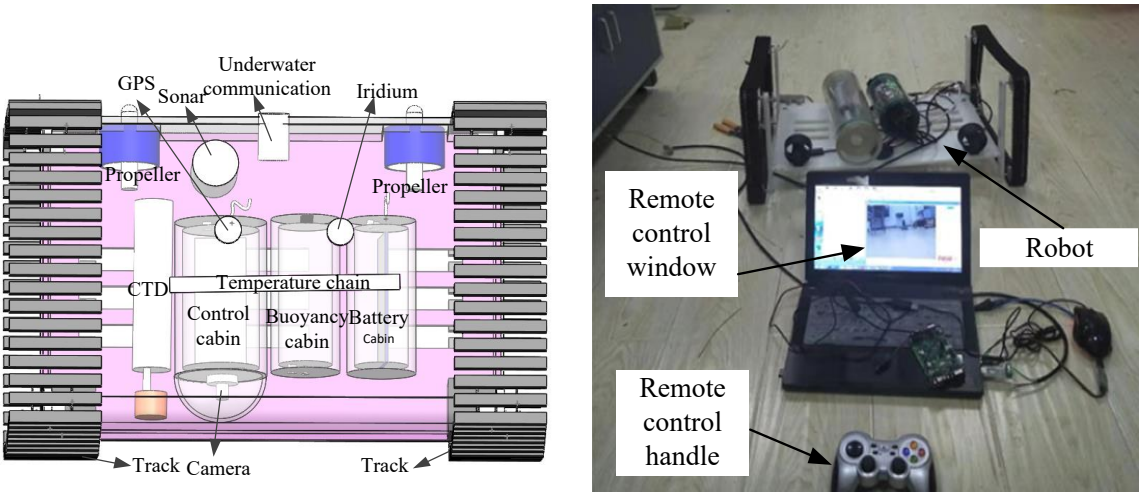

Fig 2.10 Polar robot (done by myself)

2.3 Qingdao related projects

Fig 2.11 Water quality online testing equipment and controller

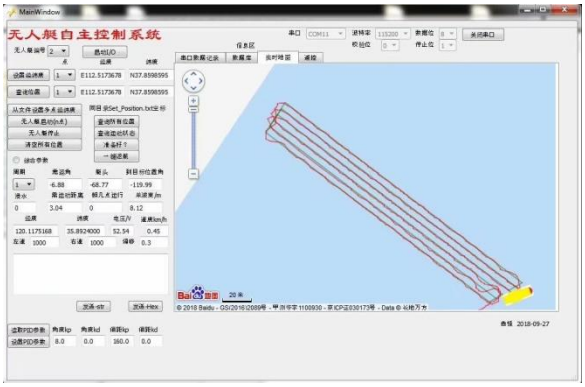

Fig 2.12 Unmanned vehicle photos & control interface

时间	温度℃	湿度%	气压 hpa	风速	风向
2019-01-13 22:15:04	6.91	48.68	1026.32	0.0	46.57
2019-01-13 22:00:04	6.95	49.55	1026.28	0.0	46.56
2019-01-13 21:45:04	7.02	49.39	1026.18	0.0	47.34
2019-01-13 21:30:04	7.11	48.85	1026.21	0.0	48.18
2019-01-13 21:15:04	7.15	48.76	1026.09	0.0	48.19
2019-01-13 21:00:04	7.23	49.05	1026.17	0.0	48.19
2019-01-13 20:45:04	7.3	49.56	1026.04	0.0	48.16
2019-01-13 20:30:04	7.34	50.09	1025.98	0.0	48.18
2019-01-13 20:15:04	7.39	50.53	1025.96	0.0	47.98

Fig 2.13 Marine ecological buoy photos & APP

Fig 2.14 Underwater acoustic communication experiment & Hydrological observation platform

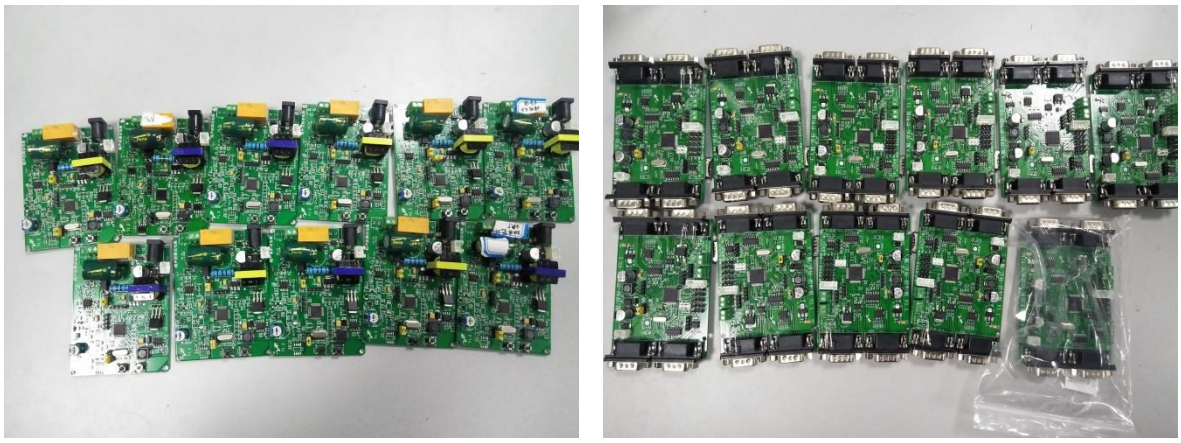

Fig 2.15 Underwater acoustic communication circuit board & Unmanned vehicle/buoy control circuit board (done by myself)

III Some research during the bachelor's period (2013-2017)

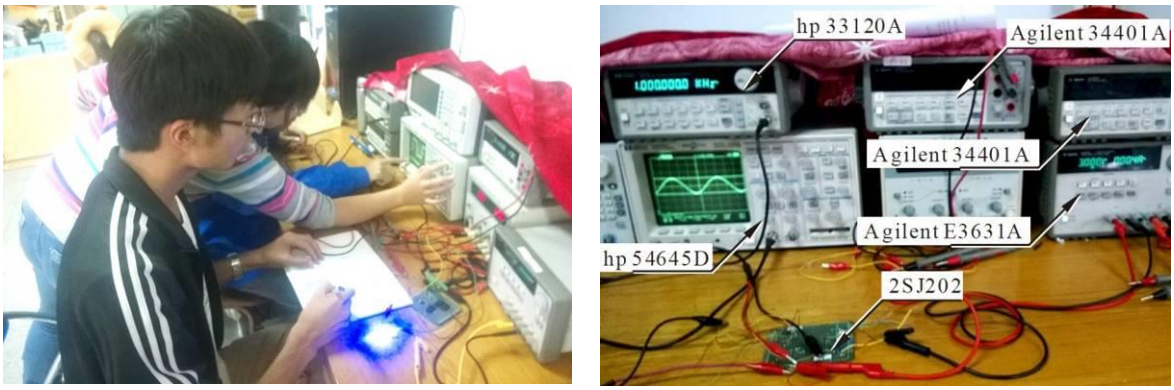

Fig 3.1 MOSFET characteristic measurement experiment

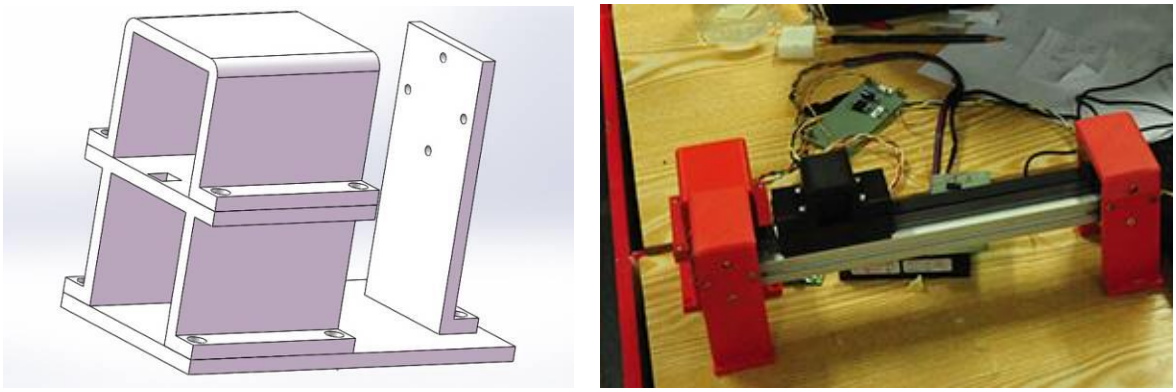

Fig 3.2 Design of linear guide rail fixing frame (SolidWorks)

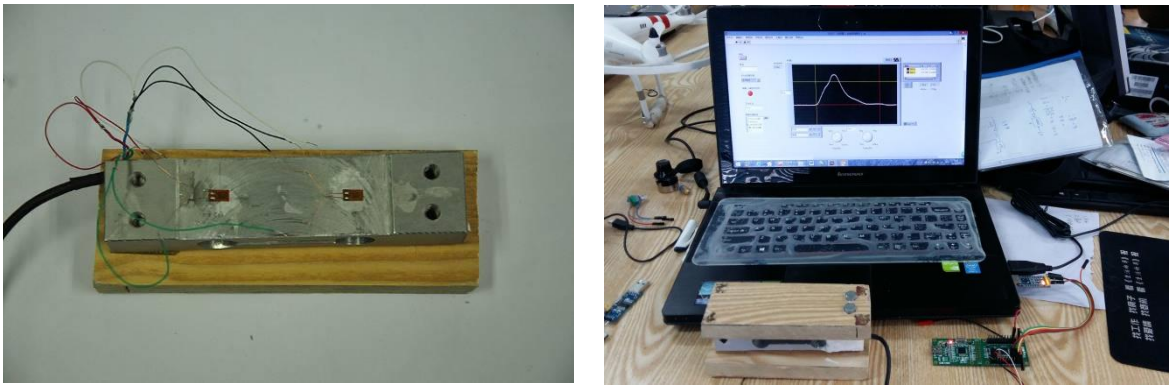

Fig 3.3 Manufacturing of force sensors & LabVIEW acquisition force waveform

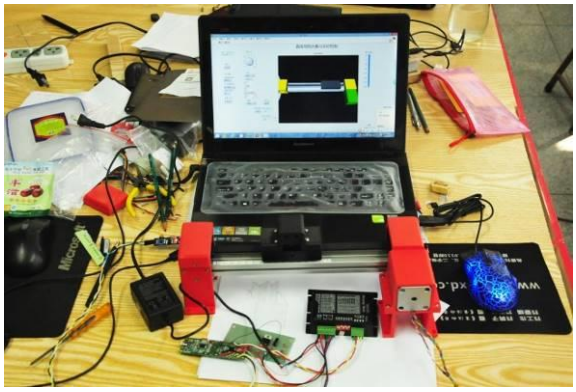


Fig 3.4 Control and Simulation of Linear Motor - Control of two long linear motors

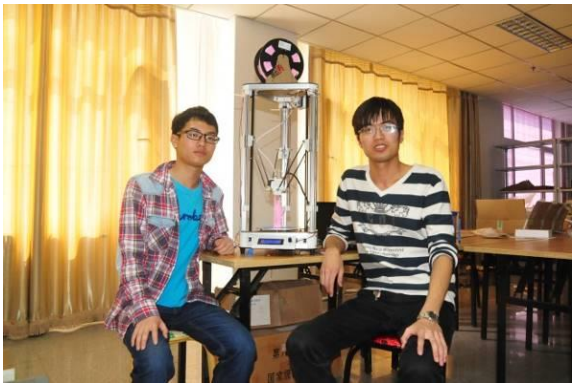


Fig 3.5 Assemble the 3D printer (right 1) & Lecture for undergraduates in Xiaoming Lab


Fig 3.6 Conduct summer lectures as a lecturer trainer & Show the computer mouse project for visitors (right 1) 2014.07

R&D EXPERIENCE (RA at CUHK, Master at TYUT and part-time RA at CUHKSZ)

Wireless power transfer and position tracking for capsule robot (PhD stage work) Sept. 2022 – Mar. 2026

Independent research The University of Hong Kong, Hong Kong Hong Kong

✧ My main work content: design the transmitting coil, receiving coil to achieve the wireless power transfer and position tracking for capsule endoscope.

Wireless magnet capsule design and magnet localization and orientation Sept. 2021 - Sept. 2022

Independent research The Chinese University of Hong Kong, Hong Kong Hong Kong

✧ My main work content: We have designed a wireless magnetic capsule, developed a Hall array sensor PCB for magnet localization, and completed the fusion of localization with IMU.

Soft Gripper with Automatically Adjustable Finger Spacing for Robot Sept. 2019 - Apr. 2020

Independent completion The Chinese University of Hong Kong, Shenzhen / AIRS Shenzhen

✧ A novel soft gripper with automatically adjustable finger spacing was developed.

Pharyngeal-swabs Sampling Robot (Rigid-Flexible Coupling Manipulator, RFCM) Feb. 2020 - Aug. 2020

Responsible for **RFCM** The Chinese University of Hong Kong, Shenzhen / AIRS Shenzhen

✧ We developed a novel intrinsic safety RFCM to improve the safety and reliability of coronavirus disease 2019 (COVID-19) OP-swab sampling.

National Key Basic Research Program of China (973 Program) - Unmanned Ice Station Sept. 2017 - Jul. 2019

Controller design Taiyuan University of Technology Taiyuan

✧ An ultra-low power consumption control board based on MSP430 is designed, which is suitable for the main and auxiliary buoys of unmanned ice station. Data collection and transmission include temperature chain, humidity, air pressure, dissolved oxygen, and CTD. The monitoring system of sea-ice-air unmanned ice station is realized.

Low Power Consumption Polar Image Monitoring System Based on Iridium 9523 Mar. 2017 – Jun. 2017

Independent completion Taiyuan University of Technology Taiyuan

✧ In order to realize unmanned monitoring of polar equipment, a low power consumption polar image monitoring system based on iridium 9523 is designed. The system was put into use in China's 8th, 9th, and 10th Arctic expeditions and the 36th Antarctic expedition, and realized the image monitoring of polar equipment.

Multi-point Low-power High-precision Flexible Temperature Chain Based on Pt1000 Mar. 2017 – Dec. 2017

Independent completion Taiyuan University of Technology Taiyuan

✧ This equipment has been used many times in the polar regions. (Mainly used chips: MSP430, ADS1232, MAX1483)

Autonomous Cruise Control Program for Unmanned Vehicle Jul. 2018 - Mar. 2019

Control section Qingdao Zhuojian Marine Equipment Technology Co., Ltd. Qingdao

✧ In order to realize unmanned seawater environment monitoring, an autonomous seawater environment detection unmanned vehicle based on RTK (differential GPS) is designed. The unmanned vehicle controller uses a self-developed control board based on STM32 microcontroller. The integrated equipment includes RTK, magnetometer, multi-parameter water quality monitor, single beam, etc. After experiments, the system can run safely and reliably according to the predetermined trajectory, and the linear running trajectory accuracy is 0.8 m; (Pub. 6)

1m/3m Marine Buoy Control and APP Display Sept. 2018 - Mar.2019

Control section Qingdao Zhuojian Marine Equipment Technology Co., Ltd. Qingdao

✧ The main control board based on STM32 and the expansion board RS485-RS232 based on STM32 are designed. The expansion board realizes that hundreds of RS232 sensors (such as multi-parameter EXO, nutrients, weather, waves, etc.) can be connected to one RS485 bus. The development of the buoy program, server program (Node.js), and mobile app were completed. (Android Studio, APP development self-study for 10 days).