HKUST ROBOMASTER

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Tutorial Information Session

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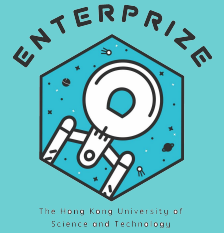
CONGRATULATIONS !
AND
WELCOME !



01 OVERVIEW OF THE REST OF THE RECRUITMENT PROCESS

02 TUTORIAL PHASE

03 INTERNAL COMPETITION

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01

OVERVIEW OF THE REST OF THE RECRUITMENT PROCESS

The entire recruitment process

Interview ⇒ **Tutorials** ⇒ **Internal Competition** (R&D) ⇒ **Team member**

WE ARE HERE

01. Overview of the rest of the recruitment process

Tutorial

Brief:
Completing assignments by self-study, attending tutorials and/or using existing knowledge background

Purpose:
- Evaluating students' foundation in relevant field
- Assessing the ability to learn new knowledge
- Assessing the ability to manage time for academic and extracurricular learning
- Evaluating the attitude and willingness toward learning relevant knowledge

Past Passing Rate: ~50%

Passing Criterion: Complete ALL assignment with good quality in at least one tutorial stream

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Internal Competition

Brief:
Candidates will be grouped into teams to develop robots and complete tasks defined by the competition rules.

Purpose:
- Giving opportunities for candidates to apply knowledge into real development tasks
- Assessing the attitude towards and ability to conduct team work
- Assessing the technical foundation to complete real development tasks

Past Passing Rate: ~50%

Passing Criterion: Contribute enough into the robot development while able to conduct team work with other candidates. In addition, subjective judgment from seniors.

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02

TUTORIAL PHASE

02. Tutorial Phase

For Research & Development Positions
{Mechanical, Hardware, Software}

- Offline tutorials (on-campus)
- Online materials (ppt, video, etc.)
- Q&A with TA's (current team members)

For Non-Research & Development Positions
{Advertisement, Finance, Logistics & Inventory Management}

- Live explanation of the tasks in our team via Zoom
- Sharing of part of the past materials / records in our team as reference materials
- Distribution of the operational tasks (starting from Oct. 10, Sun.)
- Q&A with TA's (current team members)

02. Tutorial Phase

How should you treat the Overview document sent to you via email?

That file is only an overview for the tutorial.

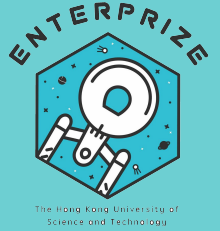
IS NOT A DOCUMENT THAT CONTAINS ALL TUTORIAL INFORMATION.

There are platforms dedicated for tutorial information for each stream.

- **Software: GitHub repository, specifically the README.md file**
- **Mechanical: Microsoft Teams**
- **Hardware: GitHub repository, specifically the README.md file**
- **Operational: Google Drive**

PLEASE CHECK THE CORRESPONDING PLATFORM FOR YOUR STREAM FOR MOST UPDATED INFORMATION !!! INFO IN OVERVIEW WILL BE OUTDATED SOON !!!

02. Tutorial Phase



More information about these platforms in later slides

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Introduction to Division Leaders

Mechanical:	**Harry**	**(English, Korean communication welcomed)**
Hardware:	**Jason CHAN**	**(English, Mandarin, Cantonese communication welcomed)**
Software:	**Jiekai**	**(English, Mandarin communication welcomed)**
Operational:	**Kei**	**(English, Mandarin, Japanese communication welcomed)**

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Software

02. Tutorial Phase

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Syllabus:

Part 1 : Environment setup, Git & Github, C++ basics
Part 2: Embedded Programming, Basic Motor Control

Format:

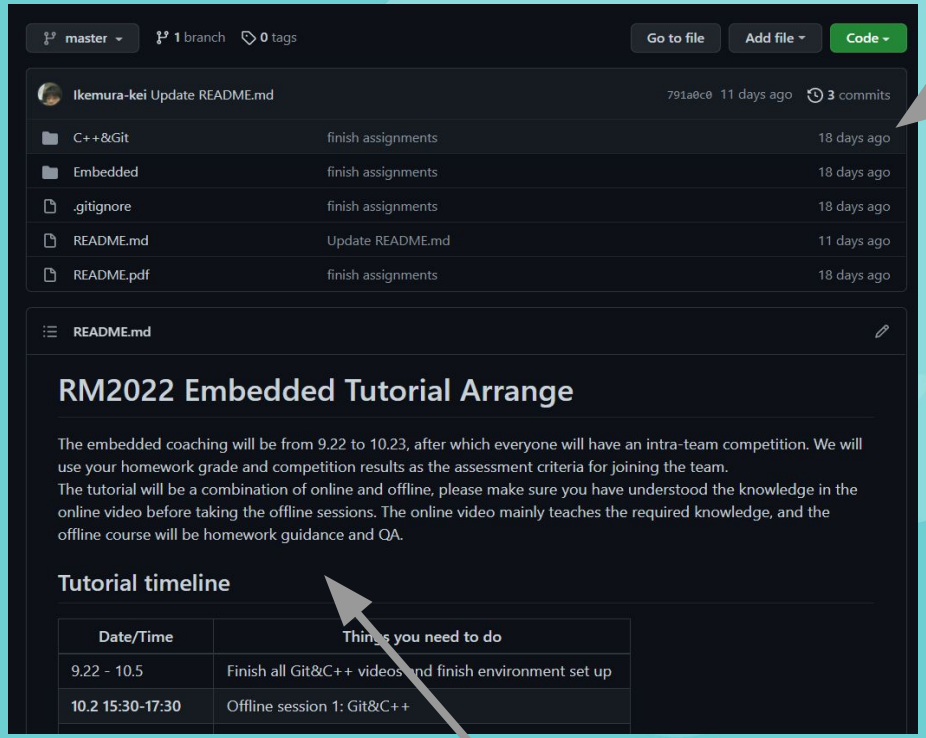
Online Video ⇒ Offline Lecture ⇒ Assignment

Finish all the online video before you go to offline lecture
On the offline lecture we will tell you how to do the assignment
Finish the assignment and submit it on GitHub / demo to us

Software

02. Tutorial Phase

Assignment



Arrangement

Software

02. Tutorial Phase

Offline tutorial session schedule:

2021.10.02, Saturday: Software tutorial 1, Git and C++

Venue: Room 2503
Time: 15:30 -17:30

2021.10.09, Saturday: Software tutorial 2, Getting started with Embedded Programming

Venue: Room 4504
Time: 15:30 -17:30

2021.10.16, Saturday: Software tutorial 3, Hardware peripherals and communication protocols

Venue: TBA
Time: 15:30 -17:30

2021.10.23, Saturday: Software tutorial 4, Motors and PID controllers

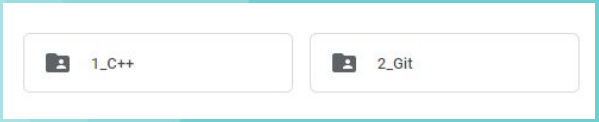
Venue: Room 4504
Time: 13:30 -15:30

02. Tutorial Phase

Getting Started?

Before the first offline tutorial, you need to do the following things:

1. Watch the C++ video **1~8** and all Git videos
2. Set up your C++ programming environment
3. Read the assignment and create your own GitHub Repo



Any Question?

Just ask in the tutorial group
Or, DM any senior member

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Some additional notes for online stream candidates:

1. For assignments that require hardware, like embedded system coding, **you could ask our seniors to arrange test session** to help test your code on physical devices. (booking should be made one day in advance)

2. For internal competition, we will announce the **alternative assessment method later**, we are still refining the criterion.

3. Join **Zoom or watch recording** if you want to participate in the offline tutorial sessions

Mechanical

Syllabus

- Tutorial 1: - Materials
- Solidworks Self-study 1: UI & Parts Modeling
- Tutorial 2: - Manufacturing
- Solidworks Self-study 2: Assemblies & Manufacturing Preparation
- Tutorial 3: Tools & Machines
- Tutorial 4: Design Study

02. Tutorial Phase

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Platform for ALL Mechanical tutorial information:

Microsoft Teams

Mechanical

02. Tutorial Phase

Some additional notes for online stream candidates:

1. The last 2 assignments require use of machines in our lab. Online students will have online alternative assignments instead.

2. Join offline tutorial in person or watch online materials

3. Check MS Teams & wechat/whatsapp announcements for arrangement updates

Mechanical

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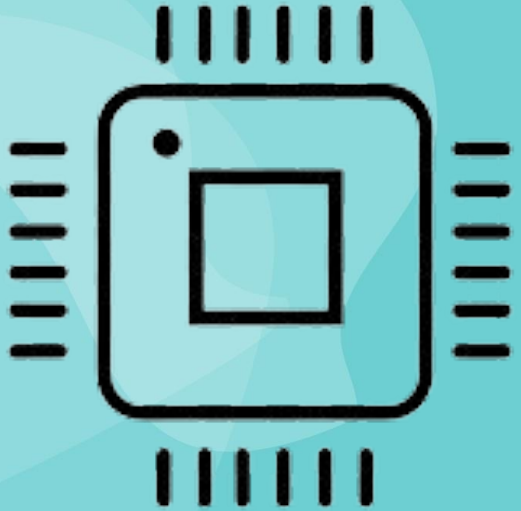
Hardware



02. Tutorial Phase

Platform for ALL Hardware tutorial information:

GitHub

Hardware

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Syllabus

Week 1 : Setting-up software environment and basic schematics

Week 2-3: Hardware components selection and schematics design

week 3-4: Footprint assignment and PCB layout design

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Join the Hardware WhatsApp group for technical discussions and fun chat with all Hardware enthusiasts!

02. Tutorial Phase

Operational

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Advertisement

- Social media account management
- Giving ideas to posts and articles
- Recording team development / events / any fun moment
- Writing posts and articles
- Editing promotion videos
- Team Wear design
- Team LOGO optimization/improvement
- Team design language refinement
- Souvenir design
- Arranging displays and demos
- And coming up with innovative ideas that would benefit team promotion

Operational

Finance

- Writing, managing and monitoring BOM (Bill of Materials)
- Budget planning & monitoring
- Expenditure analysis (monthly, yearly)
- Negotiating sponsorships
- Cash flow monitoring & managing
- And coming up with new ideas to improve financial management

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Logistics & Inventory Management

- Inventory system improvement / reconstruction
- Analyzing material usage pattern
- Managing inventory to prevent lacking materials / devices / machinery / ...
- Arranging repair of machinery
- Finding better supply chain
- And coming up with new ideas to improve team's inventory management and logistics procedure

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INTERNAL COMPETITION

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Timeline (Tentative)

2021.11.05: Ice breaking session and start of internal competition

2021.11.18: mid-term check on all groups' progress

2021.11.27: competition day

December: Arranging Demo/Display of the robots designed and assembled during competition at Engineering Common (or some other place, TBD)

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Grouping

Candidates passing through the tutorial phase will be randomly assigned to different internal competition groups.

Groupings are entirely decided by us.

Each group will include MECH, SW, and HW developers. Students need to coordinate with each other to construct robot systems.

Internal Competition Rule Preview

Each group needs to design (from scratch), assemble, and code two different robots to compete in the Internal Competition.

Robot Composition:

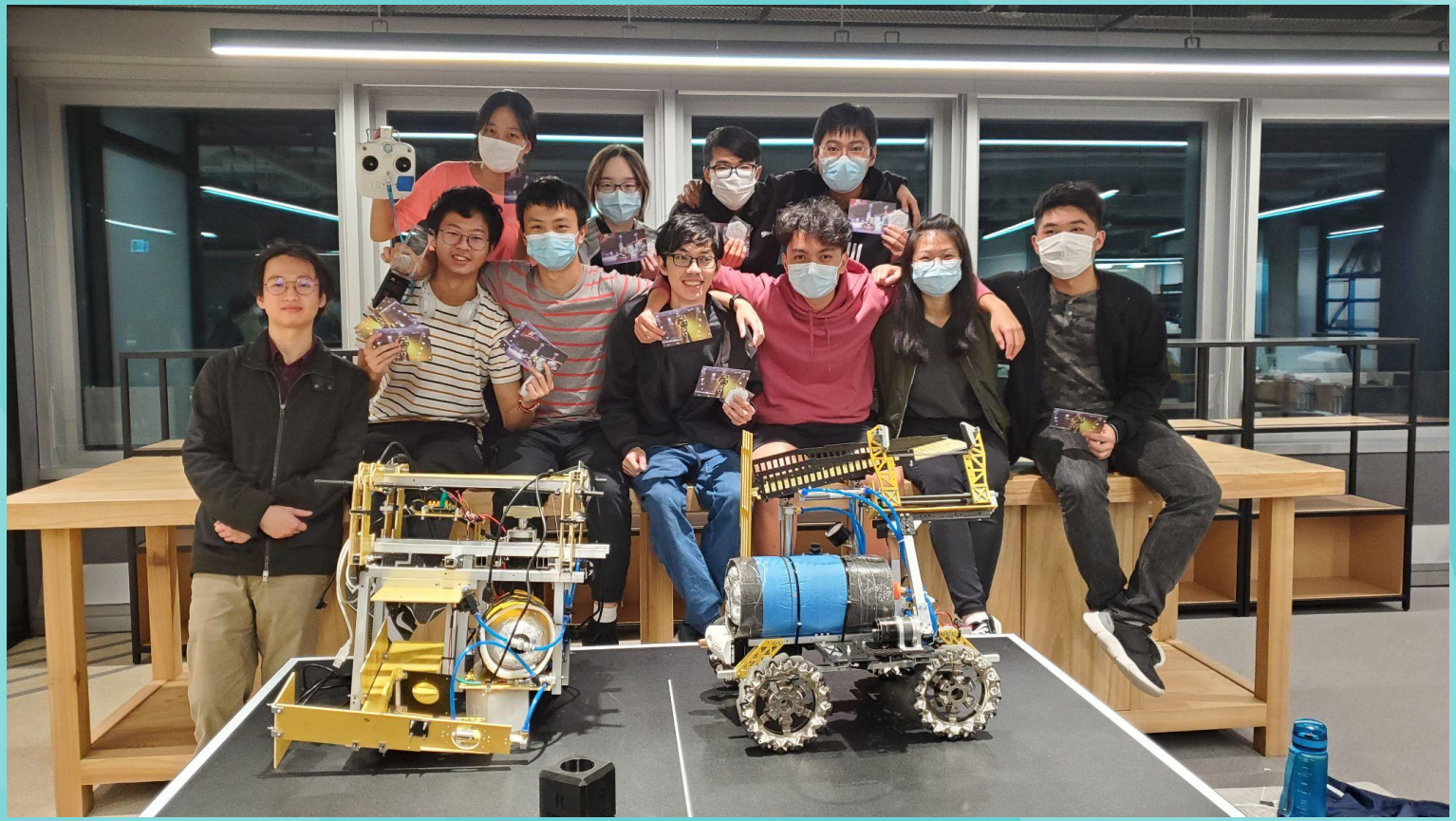
- The Deliverer (Muanual, Moving Robot)
- The Dispenser (Autonomous, Stationary Robot)

Main Game Task:

- The Deliverer picks up colored boxes from a shelf;
- The Deliverer delivers the boxes to the Dispenser by passing through obstacles along the way;
- The Dispenser picks up the delivered boxes and put them into a right place depending on the color of the box.
    - For example, green boxes goes to placeholder one, red boxes goes to placeholder two, etc.

03. Internal Competition

Past Internal Competition Robots (1)



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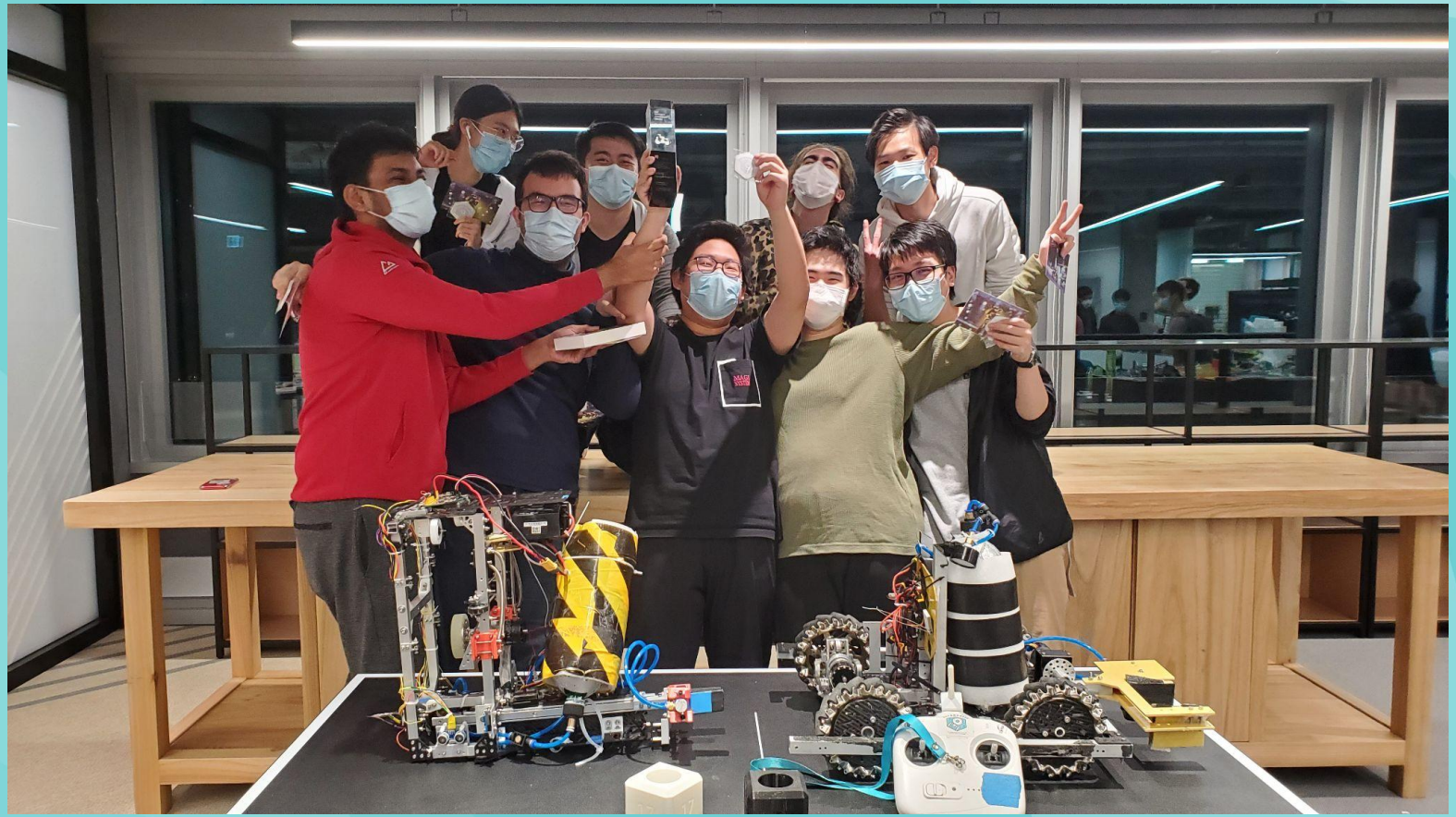
03. Internal Competition

Past Internal Competition Robots (2)



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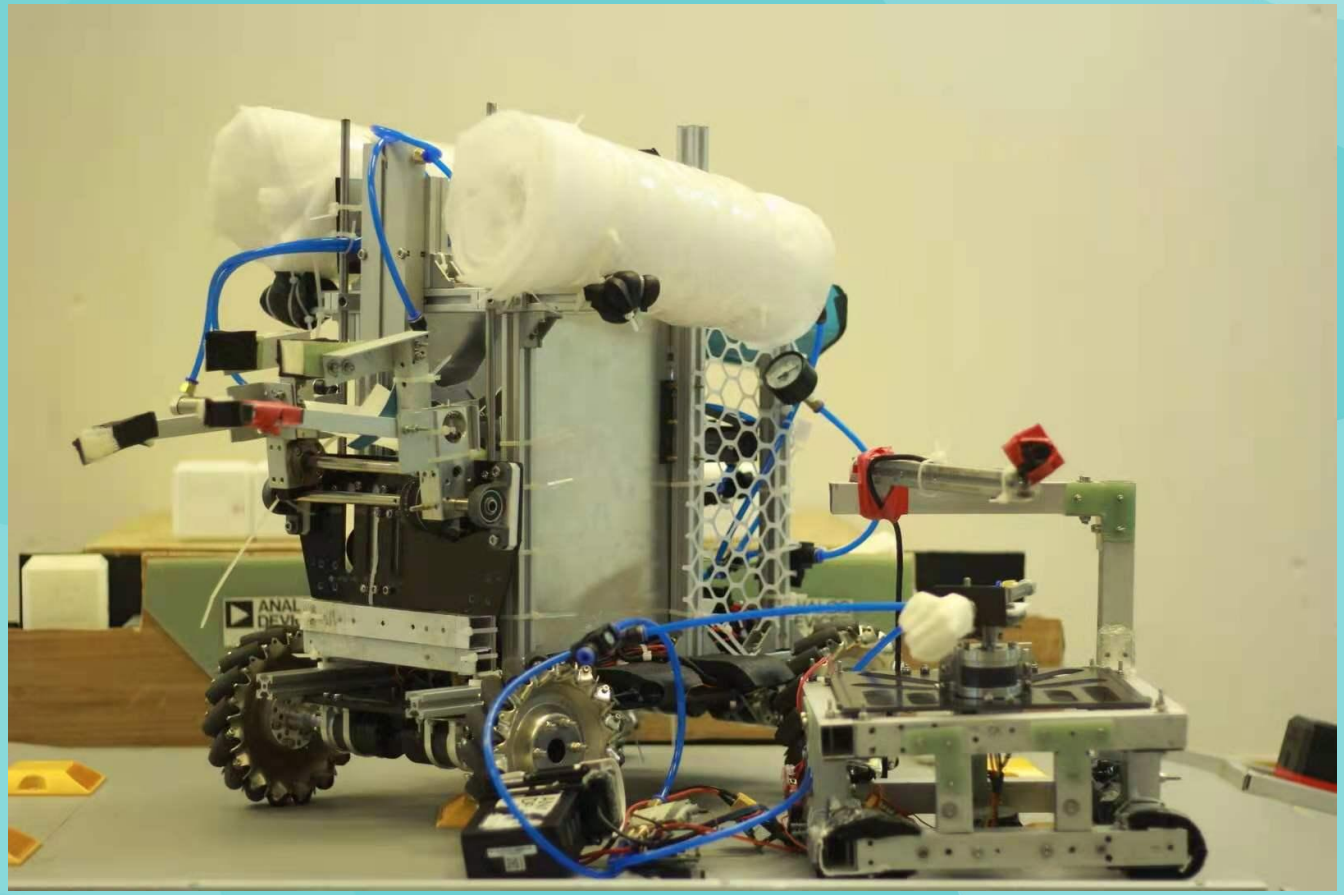
03. Internal Competition

Past Internal Competition Robots (3)



03. Internal Competition

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Mechanical members:

- Designing the mechanical structure of the robots
- Manufacturing / reusing parts to assemble the robots
- Assembling the robots
- Debugging the mechanical flaws
- Maintaining the robots

Hardware members:

- Designing the central boards for the robots
- Wiring the robots
- Maintaining the hardware components used on the robots

Software members:

- Writing codes to interact with microcontrollers
- Writing codes to control motors
- Writing high level logics to complete the game tasks

03. Internal Competition

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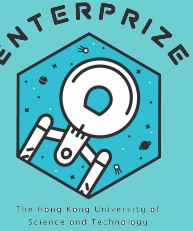
Further details will be confirmed and released during the tutorial phase



Q&A

Welcome any questions