

# Robo Rescue 2021 Team Description Paper

## TRY FOREVER

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### Motivation and purpose

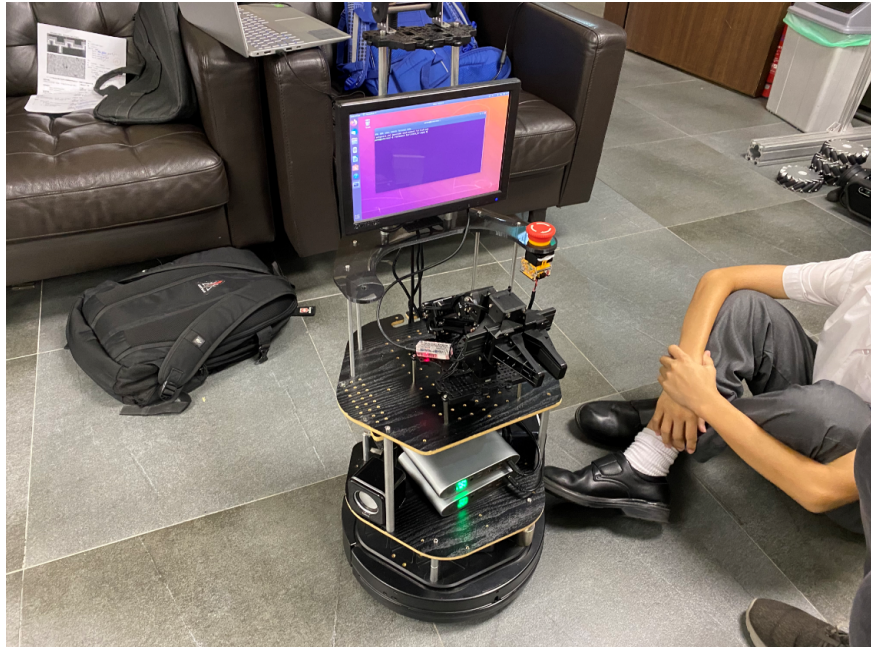
COVID-19 is the most frequently discussed topic in recent years. It is the devil that kept us isolated at home, and it is the epidemic that we hope will not happen again in the future. The sudden outbreak of the epidemic put people who were immersed in the Spring Festival into panic and fled from the east to the west. During the epidemic, isolating is an important thing to do. When we have been together with an infected person, we are very likely to be infected. The hospital helped a lot during the epidemic. In the hospital, doctors struggle to rescue patients. But unluckily, some doctors turned out to be victims of the COVID-19 because of the unfortunate contact with patients who suffer from COVID during the rescue. The project of ours is to help the hospital do better and, hopefully, non-contact daily treatment with patients. This way we can protect doctors and reduce the infection of doctors due to long-term contact with patients.

### Introduction

Our team is called 'Try Forever'. Try forever, this is what we keep in mind. During our participation in the competition, we will always try, innovate, and create better robots. Our robot is designed specifically for hospitals. Our goal is to reduce the contact between doctors and infected patients, in order to avoid unnecessary infections to the greatest margin. Our robot is very useful during this epidemic. It allows medical workers to provide psychological counseling and daily communication in a safer environment.

### Robot Structure

The shape of our robot is a cylinder that is divided into three layers. At the bottom is the main engine of the entire robot. On the second layer, there are two speakers and a camera for measuring distance. At the top, we adopted a semi-open design with a robotic arm in the middle of the platform. There is a display screen above the robotic arm and a second camera on top of the display screen.



## Function

In terms of functionality, we basically have two parts.

### 1. Deliver medicine to patients

The main part of this part is picking up designated items.

This are the most important parts:

- detect item (camera)
- Use robotic arms to get items (electronic arm)

#### (1)camera

In order for the robotic arm to get the specified item, it needs to be seen and recognized by the camera first, that is, to find this item. so we need to do this three things: read the color image, convert the image to cv2, and identify the object.

After finding the position of the object in the screen, you can start the next step-use openpose to measure the distance from the lens to the object, so that the robotic arm can get the object accurately.

#### (2)eletronic arm

We first set the robotic arm to the home pose, give XYZ to the robotic arm, and then use the functions in the original database to use

the trigonometric function to move the robotic arm to XYZ and move the robotic arm to the set position. Can accurately receive or send items in hand,

Since then, the robotic arm is partially completed.

## **2. Voice function —— talk to people**

We focus on two parts:

- Let the robot hear what we say
- Let the robot respond us

### **(1) let the robot hear what people are saying**

At this time, we use the “roslaunch mr\_voice voice.launch” program of openpose to turn on the voice and also the speaker to let the robot hear what people are saying. Then use “/speaker/say” to recognize what people said to the robot. After that, we use “/voice/text” to output the words that the robot recognizes to the person in the form of text.

### **(2) what will the robot answer**

In terms of communication between robots and people, we set that when the robot detects some keywords that people say, we use “pub.publish (“xxx”)” to push what the robot needs to respond to the human, and also the robot can say something that a human command it to do so.

By doing the steps above, we can succeed in communicating between a human and a robot.

## **Future**

**This robot that is designed for users can:**

- Reduce the infection rate of the pandemic, improve safety
- Reduce unnecessary accidents caused by patients or doctors taking things
- Detect whether people on the street are wearing masks, reduce the increased infection rate due to incorrect wearing of masks

**social benefits:**

When the robot is really put into society to work, it can replace some repetitive work, so that some cheap labor can be replaced by this robot. Also, it can improve the quality of service. In this outbreak, many doctors have unfortunately contracted the virus in contact with patients, so the robot can also reduce the contact time of doctors and patients, greatly reducing the infection rate.

**Other aspects of sustainability:****1.Can be used as life assistants for the elderly and young children:**

- The program is connected with the camera to ensure the needs and safety of the elderly and young children in real time
- Help the elders or young children to get some items conveniently

Nowadays, there are many hidden dangers to the elderly and young children. It is difficult for these people to move around or take a lot of time to get some things. In order to reduce accidents, someone needs to help them get what they need. This robot's robotic arm plays a big role, it helps these people in difficulty to get what they need, also to reduce accidents from happening.

**2.Can be used in hotels:**

- help finish part of the labour's jobs
- quickly detect the user's needs, and complete the user's requirements as quickly as possible

Nowadays, apart from uncontrollable elements such as the epidemic, tourism is also an important chain of social development. Therefore, people's requirement for hotels is only increasing. At this time, robots can be used to replace some of the most basic labor. People need to take a break from time to time, but the robot can go to work all the time. It can also reduce the workload of the labor force and the company's expenses.