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# On the Design of Home Robot

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***Abstract:*** *In order to solve the aging problem and the empty-nest elderly problem, to reduce the burden on children and make the elderly laugh often, enhance the promotion of robots in caring for the elderly, improve the quality of products, and increase the sense of experience in use, standing rationally Considering the ethical and moral issues of this model and the relevant policies issued by the government, it provides a certain idea for the smooth application of intelligent robot care for the elderly [1].*

***Keywords:*** *the elderly; companion robots; lighten the burden*

## 1. Introduction

In recent years, the problem of population aging in our country has become increasingly serious. Statistics show that as of the end of 2018, my country has nearly 250 million people over 60 years old, and is the only country in the world that has more than 200 million elderly people. As the aging of the population intensifies, the issue of elderly care has become prominent. In essence, the degree of population aging is not a determinant of socio-economic pressure. The social security of the elderly requires a strong economic foundation and sufficient social resources to support it. From the perspective of my country's current economic development, it still does not have it. Sufficient economic foundation and social conditions, so the aging problem so far has brought tremendous pressure to our country and social and economic development.

So in order to cope with this problem, I want to develop an intelligent robot that can accompany the elderly to chat, remind them to pay attention to their physical condition, send the physical condition of the elderly to their children in text, and focus on the spiritual needs of the elderly. Smart elderly care technology has broad development space. The human-computer interaction function of the intelligent robot can understand the world's major events from the robot's voice broadcast news, and the information acquisition is very simple and fast. Supports listening to multiple radio stations with various functions. At the same time, this robot is also the intimate care of the elderly. When an emergency occurs, as long as the call "help", the robot will immediately transmit the information to the child's mobile phone to realize the call for help. When children go to work or go out, they can also use the silent monitoring mode of the robot to check the situation at home and talk to their parents, so that the elderly can be safer and more secure.

## 2. Composition

As the carrier of artificial intelligence technology, robots can now be widely used in many industries, such as: industry, military, service industry, medical treatment, entertainment and other fields. In high-risk, high-load industries, robots are even a good helper, and it can be said that they are an indispensable carrier. However, the issue of controlling robots is the top priority of our research. So this robot needs an energy source to drive these transmission devices [2]. The robots we see every day use bidirectional thrust pistons, which can make the parts of the robot move in two directions. There is a vital computer in the robot, which is to control all the parts connected to the circuit in the robot. The computer turns on the relevant motors and valves to make the robot run. If we want to change the behavior of the robot, we can import a new program into the computer to achieve it. But not all robots have sensor systems. A small number of robots have vision, smell, hearing, and higher-end taste. Common robots generally have a sense of movement, which is the ability to monitor their own movement. In the usual standard design, there is a light-emitting diode on the joint of the robot body, which emits a beam of light and shines on his optical sensor, and the optical sensor will quickly read out the data and send the data to the computer. The computer will accurately calculate the optional

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degree and distance of the robot joints based on the data.

### *2.1 Hardware composition*

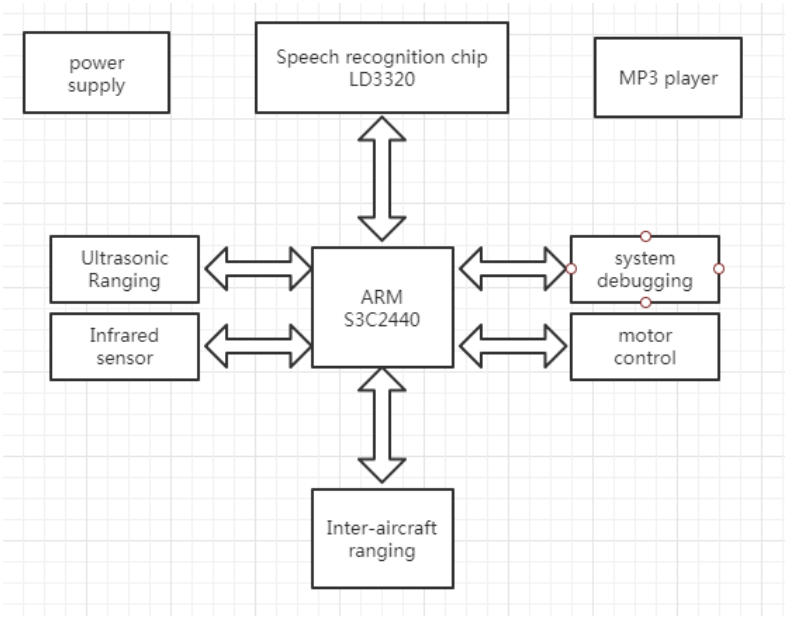


*Figure 1 shows the robot hardware configuration*

ARM S3C2440 chip has 16K data cache and 16K instruction cache, MMU cache is fine and simple, and fast 2-priority-level interrupt subsystem, and has a switchable register bank, fixed 32-bit The width of the operation code reduces the consumption of the number of codes, and reduces the burden of decoding and pipeline; the language recognition chip LD3320 can recognize the speech, which allows the machine to understand the human language, and can perform various actions according to the language commands, such as Blink your eyes, move your mouth, turn your head, etc. In addition, the speech recognition chip also has high-quality, high-compression rate recording and playback functions, which can realize fast human-machine dialogue; in order to allow mobile robots to automatically avoid obstacles and walk, it is necessary to install a ranging system to make It obtains the distance information (distance and direction) from the obstacle in time. Use the GP2D12 infrared sensor to search and track the infrared target, determine its spatial position and track its movement.

### *2.2 Software composition*

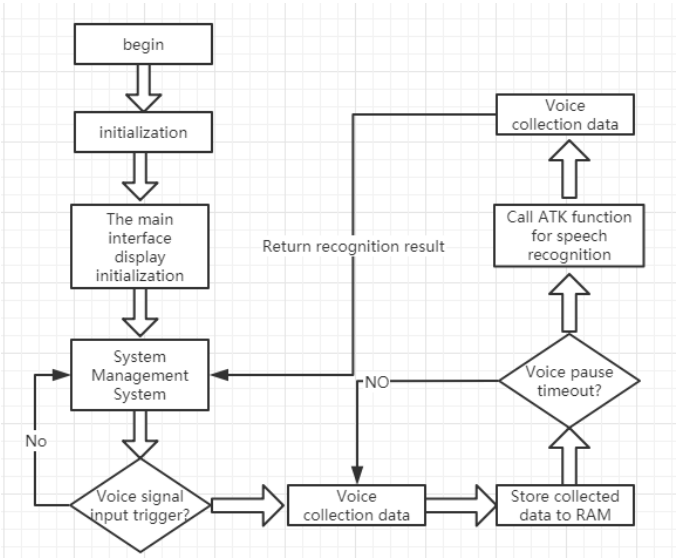


*Figure 2 is a diagram of the robot software composition*

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This robot first collects high-definition video through the camera IMX178, and then performs preprocessing and H.265 encoding and compression inside the processor, connects to the Internet through a wireless network card and a wireless router, and transmits the H.265 encoded video stream to the cloud. After cloud storage and cloud computing, it is sent to PC and mobile phone [3].

## 3. Operation and debugging

After many runs and debugging, it is found that speech recognition can only recognize Mandarin, and it needs to be re-recognized if the speech pauses for too long. Therefore, there are still some shortcomings here. I will continue to study and explore in the next study and life.

## 4. Conclusion

For robots to take care of the elderly, are they safe and whether they can fully replace or even surpass children and carers in terms of function. These problems are all problems that robot caregivers need to solve. With the improvement of technology, safety and the replaceability of care technology can be gradually solved. Research on the robot modeling design found that the combination of network game Delphi and the multi-attribute decision-making method can improve the rationality and feasibility of the evaluation of the modeling design of the elderly service robot, and realize the scientific selection of the design scheme [4]. However, the most important thing is whether care robots can emotionally replace humans, especially children.

On the surface, the care robot is cold, unable to have emotional communication with human caregivers, and even less able to generate emotional support and warmth similar to children. However, this may be the advantage of robot caregivers. They will always take care of the elderly without resentment, will not be angry, will not have emotional reactions, and will not hate the job. This may be an important way to care for countless elderly people in China, which has a large population.

## Acknowledgement

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