

Lesson 5: ROBOTICS

Task 1 Discuss:

1. What do you associate with the word “robot”?
2. What jobs can robots do nowadays?
3. Imagine you have a robot at home. Which household chores would you like the robot to do for you?
4. What films have you seen with robots in? / What books have you read about robots? What were the abilities of the fictional robots? Do you think that robots with these abilities will ever exist?
5. What are the things that people do better than computers? What are the things computers do better than people?

Task 2 Vocabulary

Decide which device is being referred to and match words with their definitions.

| | | | | |
|-----------------|------------------|------------------|----------------|----------------|
| sensor | infra-red | component | robot | circuit |
| computer | operate | signal | command | program |

1. A logical sequence of operations to be performed by a digital computer _____
2. _____ Relating to electromagnetic radiation having wave-length greater than those of visible light _____
3. The path (complete or partial) of an electric current _____
4. To produce an effect _____
5. One of the parts or elements of a mechanical or electrical complex _____
6. Device, such as a photo-electric cell, that receives and responds to a signal or stimulus _____
7. Man-like mechanical device, capable of performing human tasks _____
8. A transmitted effect conveying a message _____
9. A signal activating a mechanism or setting in motion a sequence of operations (by instruments) _____
10. An electronic machine which performs rapid, often complex calculations or compiles and processes information _____

Task 3 Meet Stan D. Ardman

Before you listen

Discuss the questions:

- How do you think medical and nursing students practise to perfect their techniques?
- Would you let a medical or nursing student practise on you?

Check the vocabulary:

Worst-case scenario; bodily functions and conditions; treatment; template; severe reaction; complaints; CPR; a bar code; syringe; adverse reaction; reboot; attached

Listening I

Listen to the talk and answer this question:

- Who is Stan D. Ardman and how does he help medical students?

Listen again and complete the information in the sections as given below:

Appearance and condition

-
-

What he is

-
-

Simulates

-
-
-

How he works

-
-
-

Pros for medical students

-
-
-

STRATEGIES

| COMPARING | CONTRASTING |
|------------------------------|--------------------------------------|
| In the same way, ... | While/ Whereas X..., Y... |
| In comparison, ... | In contrast, ... |
| X is similar to Y in that... | Y is different from X because ... |
| Likewise, ... | One difference between X and Y is... |
| Just as X ..., Y also... | Unlike X, Y ... |
| Similarly, ... | X differs from Y in that... |
| Like X, Y ... | |

Listening II

- Listen to eight statements about Stan D. Ardman and tick the expressions that you hear in the Strategies box.
- Now listen again and note down the similarities and differences that the speaker mentions.

Similarities

Differences

After you listen

Choose the phrases from each list in the box above and compare Stan with a real patient.

Task 4 Can Robots Be Programmed to Learn from Their Own Experiences?

<http://www.scientificamerican.com/article.cfm?id=robot-learning>

Read the article and complete it with suitable words.

Researchers program robots to see if they can learn a very human trait: common sense

By Julian Smith, March 23, 2009



Image: © ALEXANDER STOYTCHEV

It took just a few decades for computers to _____ from room-size vacuum tube-based machines that cost as much as a house to cheap chip-powered desktop models with vastly more processing power. Similarly, the days of "personal robots"—inexpensive _____ that can help out at home or the office—may be closer than we think. But first, says Alexander Stoytchev, an assistant professor of electrical and computer engineering at Iowa State University in Ames, robots have to be taught to do something we know instinctively: how to learn.

"A truly useful personal robot [must have] the ability to learn on its own from interactions with the physical and social _____," says Stoytchev, whose field of developmental robotics combines developmental psychology and neuroscience with artificial _____ and robotic engineering. "It should not rely on a human programmer once it is purchased. It must be trainable."

Stoytchev and a team of grad students are _____ software to teach robots to learn about as well as a two-year-old child. Their platform is a humanoid robot that sprouts two 60-pound (27-kilogram) Whole Arm Manipulators (WAM) made by Cambridge, Mass.,-based Barrett Technology, each tipped with a 2.6-pound (1.2-kilogram) three-fingered BarrettHand.

In one set of experiments, the robot was presented with 36 different objects, including hockey pucks and Tupperware. It could _____ five different actions with each one—grasping, pushing, tapping, shaking and dropping—and had to identify and classify them based only on the sounds they made. After just one action the robot had a 72 percent success _____, but its accuracy soared with each successive action, reaching 99.2 percent after all five. The robot had learned to use a perceptual model to recognize and classify objects—and it could rely on this model to _____ how similar two objects were with only the sounds they made to guide it.

Another set of experiments showed the robot could learn to tell whether or not something was a container. The team presented the machine, topped with a 3-D camera, with objects of different shapes. By dropping a small block on each one and then pushing it, the robot learned to _____ objects either as containers—those that moved together with the block ["co-moved"] more often when pushed—or as non-containers. The robot could then use this knowledge to _____ whether unfamiliar objects could hold things; in other words, it had learned, roughly, how to discern the unique characteristics of a container.

When personal robots finally hit retail chains, they might look something like HERB, the "Home Exploring Robotic Butler" created at an Intel lab in Pittsburgh. It is part of the company's Personal Robotics Project, whose _____ is to make a truly autonomous robotic assistant that can perform routine tasks at human speeds in cluttered environments like homes or offices.

Read the reactions to the article and summarise each writer's idea:

1. Why are we teaching robots to learn? Haven't you people seen Terminator!!! We are all gonna die!
2. OK, so we can teach robots simple learning algorithms. I was very pleased when I taught one to find its way out of a maze by the shortest route. But remember Einstein taught himself that $E=Mc^2$ without any form of computer. Just try writing code to do that!
3. There is a saying I heard a while back: "a computer never really has an error, it always does exactly what it was programmed to do. The human who programmed it made all the errors." If androids go crazy and kill us all, it's because we programmed them with the capacity to do so.

Task 5

Watch the video on the same topic as described in the text above.

Have you learned any new information about the project?

What is the ultimate goal of the researchers?

<http://science.discovery.com/tv-shows/brink/videos/brink-artificial-intelligence-arrives.htm>

Task 6

Compare and contrast the robot described in the video and text with a child or

Compare and contrast the robot from the video with other robots.