AI Light Controlled Cart

Warning! Not suitable for children under 36 months because of small part(s) – Choking hazard. Only for use by children over 8 years old. To be used solely under the strict supervision of adults that have studied the precautions given in the experimental set. Hair entanglement may result if the child's head is too close to the motorized unit of this toy. This toy contains functional sharp point – on the component leads. Do not short-circuit the battery terminals and motors, which may cause overheating. Do not lock the motor or other moving parts, which may cause overheating. Use with care and only under supervision of adult.

Packaging materials are not toys. Please remove all packaging and packing tags/wires before giving this toy to your child.

CAUTION! Take extra care during unpacking and use.
Please take note: As an extra precaution, check this toy regularly for signs of wear or damage. Read the instructions carefully before use, then follow them and keep them for reference.

Warning! Do not short-circuit the battery terminals and motor, which may cause overheating. The wires are not to be inserted into socket outlets.

Batteries required: 3 x AAA (Not included)

IMPORTANT: Keep these instructions. DO NOT DISCARD.

1. Only adults should install and replace batteries.
2. Alkaline batteries are recommended.
3. If the device has not been used for a long time, remove the batteries.
4. Do not use rechargeable batteries.
5. Do not mix old and new batteries.
6. Do not mix alkaline, standard (carbon zinc) or rechargeable (nickel cadmium) batteries.
7. Exhausted batteries are to be removed from the toy.
8. Non-rechargeable batteries are not to be recharged.
9. The supply terminals are not to be short-circuited.
10. Only batteries of the same or equivalent type as recommended are to be used.
11. Batteries are to be inserted with the correct polarity.
12. Do not dispose of batteries in fire, batteries may explode or leak.
13. Batteries may explode or leak if misused.

If at any time in the future you should need to dispose of this product please note that Waste electrical products should not be disposed of with household waste. Please recycle where facilities exist. Check with your Local Authority or retailer for recycling advice.(Waste Electrical and Electronic Equipment Directive)

Introduction

Artificial Intelligence (A.I.) is a branch of *Science* which deals with helping machines find solutions to complex problems in a more human-like fashion. This generally involves borrowing characteristics from human intelligence, and applying them in a language the computer understands. Researchers are creating systems which can mimic human thought, understand speech, beat the best human chess player, and countless other feats never before possible.

The word "robot" originates from the Czech word robota, meaning drudgery. A robot is something that senses the world in some way, does some sort of computation, deciding what to do, and then acts on the world outside itself as a result. Basically a robot consists of:

- A mechanical device, such as a wheeled platform, arm, or other construction, capable of interacting with its environment
- Sensors on or around the device that are able to sense the environment and give useful feedback to the device
- Systems that process sensory input and instruct the device to perform actions in response to the situation

The science and technology that deals with robots is called robotics. These AI robot kits let you explore how robot sensors work to connect them to the outside world.

What does it do?

The AI Light Controlled Cart will move according to your "Light Command". For example, flash a light on it once to move forward and flash twice to make a left turn.

How does it work?

The light flashes are detected by a light sensor which produces an electrical ON-OFF signal. The microcomputer on the circuit board decodes this ON-OFF signal into commands and controls the motors to move the cart accordingly.

Components:

1 Chassis x1
2 Middle wheels x2
3 Small wheels x4
4 Wheel rings x2
5 Battery box x1
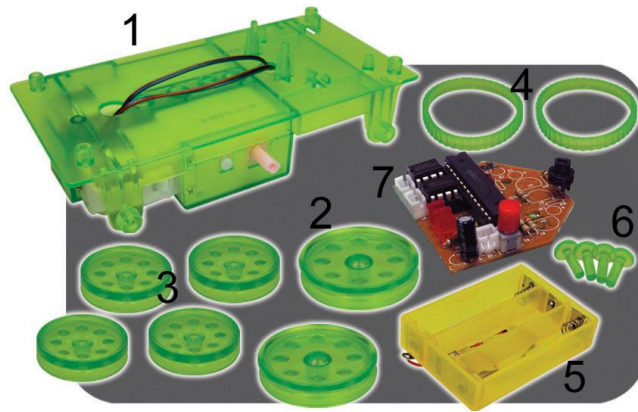6 Pins x4
7 Circuit board x1
8 Flag x1

Fig. 1

Steps:

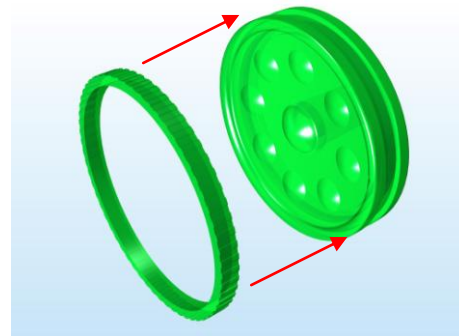1. Put the wheel rings (4) over the middle wheels (2). (Fig. 2)

Fig. 2

2. Install the middle (2) and small wheels (3) to the chassis (1). Use the pins (6) to secure the small wheels to the front and rear of the chassis (1). (Fig. 3)
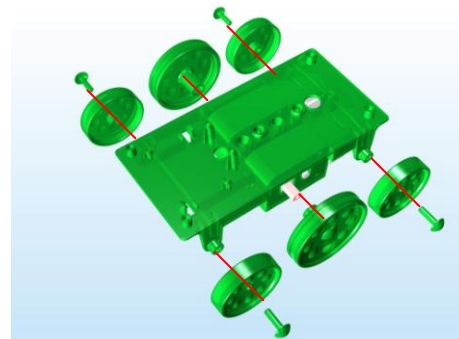
Fig. 3

3. Attach the battery box (5) on the top of the chassis. (Fig. 4)
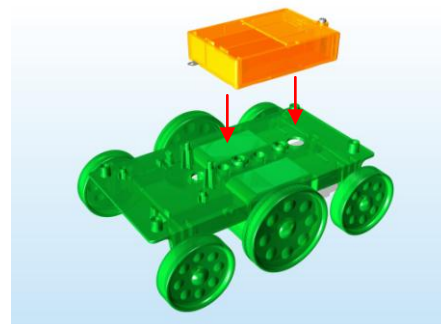
Fig. 4

4. Use a screwdriver (not included) to loosen the screw of the battery cover and install 3 AAA size batteries into the battery box according to the polarity mark. Replace the battery cover and tighten the screw. (Fig 5)

Fig. 5

5. Install the flag (8) as shown in Fig. 6.

Fig. 6

6. As shown in Fig. 7 and 8, install the circuit board (7) on the chassis and connect the wires:
   i. Battery plug to the socket "3V" (A).
   ii. Left motor plug to socket "Left" (L).
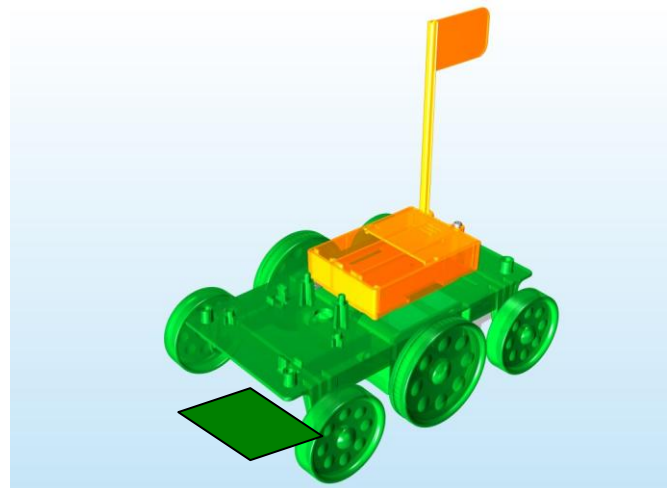   iii. Right motor plug to socket "Right" (R).
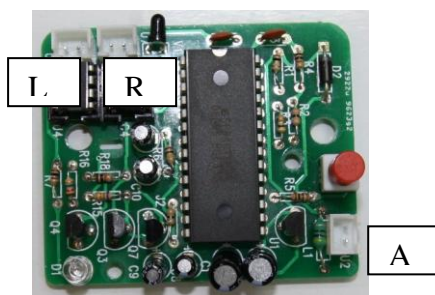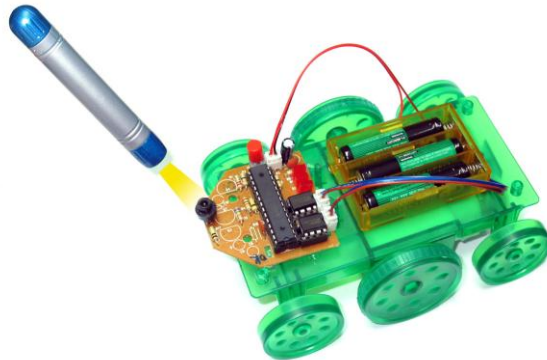   Done!

L   R

A

Fig. 8

Fig. 7

How to Play:

Fig. 9

Press the red power button to switch it on. As shown in Fig. 9, use a flashlight and shine short flashes on the sensor to command the unit to move according to Table 1 below. A strong flashlight using incandescent light bulb works best. When it detects a light pulse, the red LED will turn on. The flashes of each command must be completed within 2 seconds. Do not pause too long between the flashes, otherwise it will not respond correctly. Note that there is a short delay for the robot to act after it received the command. It is because it has to make sure the command is really completed.

Number of flashes	Command
1	Stop
2	Forward
3	Backward
4	Turn right
5	Turn left

Table 1