How robot see the world

Nowadays, robot is often a magic thing appearing in our life. But there was always a difficult problem in this industry. And even the technology being so well-developed the problem was still in the way when people want to progress using robot technology. The problem is about CV(Computer Vision) and the detail can be to solve the robot vision using camera, laser or other hardware which can collect the image data from the environment around robot or people.

General way to implement the robot vision can sum up to 3 steps. Firstly, collect image data using camera or laser from the environment. And the data should be very clean and sharp (sharp image means the data was collected very well and can be use easily in most case).Secondly, identify image by a computer program and math tools.Finally, use suitable optimize algorithm to calculate the information we need from the data and analyze the final consequence to find a reliable way to help robot see the world. Usually using these 3 steps, a robot can work very well in a good situation. Here gives the detail explanation about steps.

Collecting image data from the environment is a most careful thing in these 3 steps. Whatever you use camera or laser even a high technology thing like special radar in military installation, the only purpose is to obtain a set of sharp image which was less noise and clean lines with every objects in the image data. Most laboratories often use camera or laser to collect this data, so the algorithm to analyze this data is about how to handle a set of picture pixels one by one or group those pixels and handle them group by group.

When a sharp image data was collected and the sets of picture pixels grouped by computer algorithm, a most general algorithm should be used in the case of identifying objects: Feature Point Extraction. Actually we cannot make computer or robot collect image data like a real person because the real world is continued and everywhere was not a point but a continue object which we can observe it very clearly even using microscope. The real picture robot can collect was a matrix consisting of many rows and columns which filled with numbers from 0 to 255(in hexadecimal number is from 00 to FF, also in binary number is from 00000000 to 11111111). So usually we can calculate these numbers use mathematic methods to solve the problem about identifying objects.

If a pure image was calculated into a special data table which contains many identifying objects, a robot can easily find a route to walk. This appearance was defined a vision case of robot like normal person. A robot can identify these objects in his camera using some mathematic algorithms and calculate some necessary information like the distance between him and objects, the relation of these objects, even “guess” what the objects can do. And all those functions were founded on the implement of robot vision.

Robot vision is a high technology field in this industry and more and more people make contribution to this field in recent years especially in China and India. To make thing more intelligence and even smarter than a real normal people, these scientists were never give up. And they believe a smart robot which can really take place of people would be produce in the last few years if these scientists continuously make effort in the mathematic or computer vision works.