"Tocco"

Communication Robot "Tocco" aiming to support Locomotion Training

What is Locomotive Syndrome?

Locomotive Syndrome is described as the high risk condition to be bedridden or nursing care level, and The Japanese orthopaedic association named it as Locomotive Syndrome.

What is Locomotion Training?

The actual only way to prevent Locomotive Syndrome is to keep having moderate exercise every day. To deal with this problem, The Japanese orthopaedic association devised the training, which is not to stress legs and loin too much, and also to continue it every day. We call this training as “Locomotion Training”.Locomotion Training consists of two exercises.

(1) Stand on one leg
with your eyes open

(2) Squat

Present Problem

Locomotion Training is effective exercise to prevent to be Locomotive Syndrome, and easy exercise so that people can exercise whenever or wherever they want to do. But because of the easiness, it is quite boring for them. This is the reason why Locomotion Training doesn’t spread out in society.

Research purpose&Function

“Tocco” is developed as a partner of Locomotion Training.

Using Kinect as Vision sensors, “Tocco” can detect the user’s motion, and respond to the users. For example, if users made mistake while their training, “Tocco” advise how should it be, and encourage the user. And also if users do well, “Tocco” praise users.

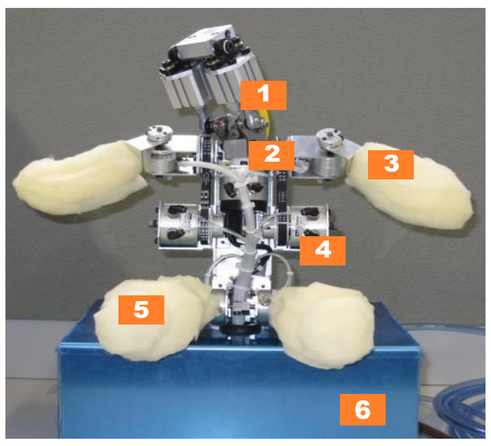
Not only detects body movement, Kinect also detects user’s expression, so that Tocco’s utterance can change user’s reaction.

Exterior covering

(Sekiguchi Co.)

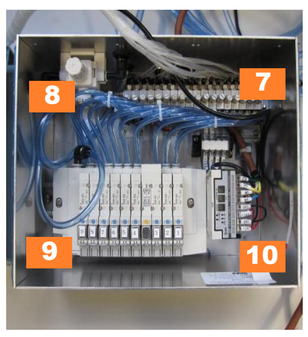
Body drive system

(Kokoro Co.)



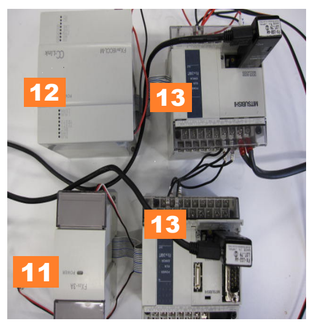
1 neck forward and back cylinder
2 neck right and left cylinder
3 arms opening and closing cylinder
4 arms up and down cylinder
5 feet up and down cylinder
6 valve box

Valve unit&Controller

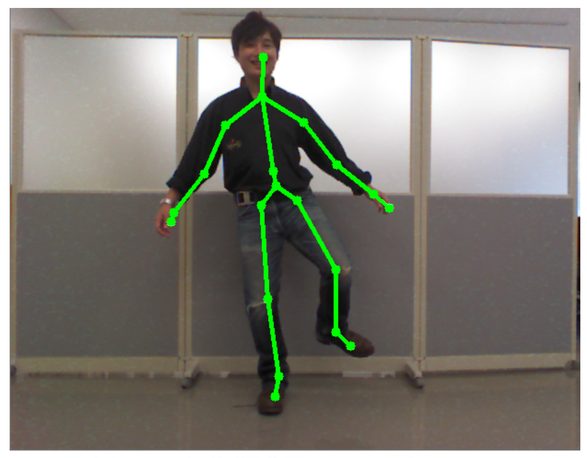


7 Speed controller
8 Filter regulator
9 Valve
10 Serial Comm. system

11 Extended analog I/O module
12 CC-LINK (Fx2N-16CCL-M)
13 PLC (Fx1N-24MT)

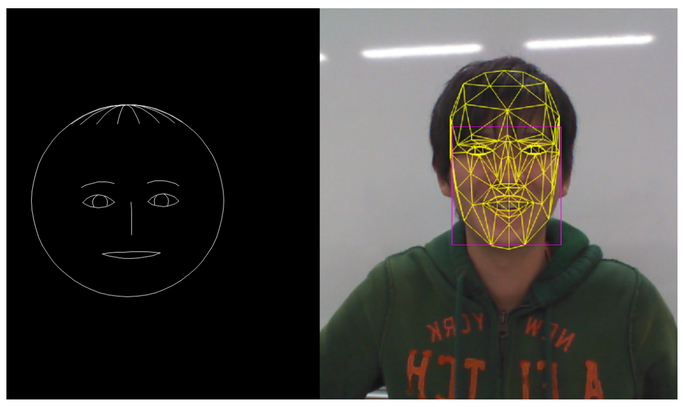


Training evaluation



Using KINECT to evaluate if exercise is accurate or not

Expression evaluation



Using KINECT to evaluate expression.

Voice recognition&Utterance

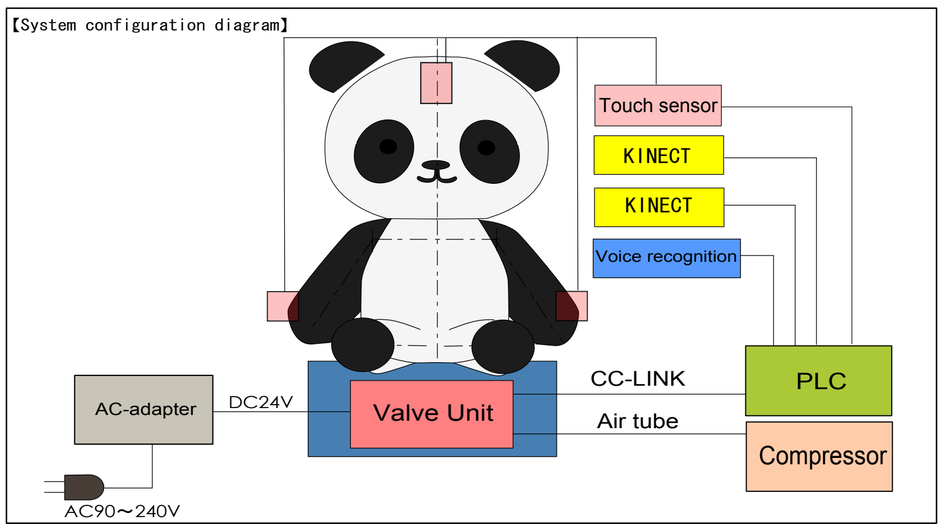
Supporting users locomotion training by voice recognition&utterance.

How to start Tocco's Locomotion Training program

Voice utterance | **Voice recognition**

"Which do you want do Stand one leg or Squat?" → "Squat!" → "Let's start Squat!" ⇒ Squat evaluation

【System configuration diagram】



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