

HOW CAN A ROBOT ALERT PEOPLE TO THE NEED FOR SOCIAL DISTANCE ?

With Covid-19 you must commit to the social distance. How can robot alert people of the need to leave a distance at least 1 meter between each other in a public place. It is a challenge for robot to know if there is crowding of people or not. One of the solutions that used is bluetooth Beacon technology

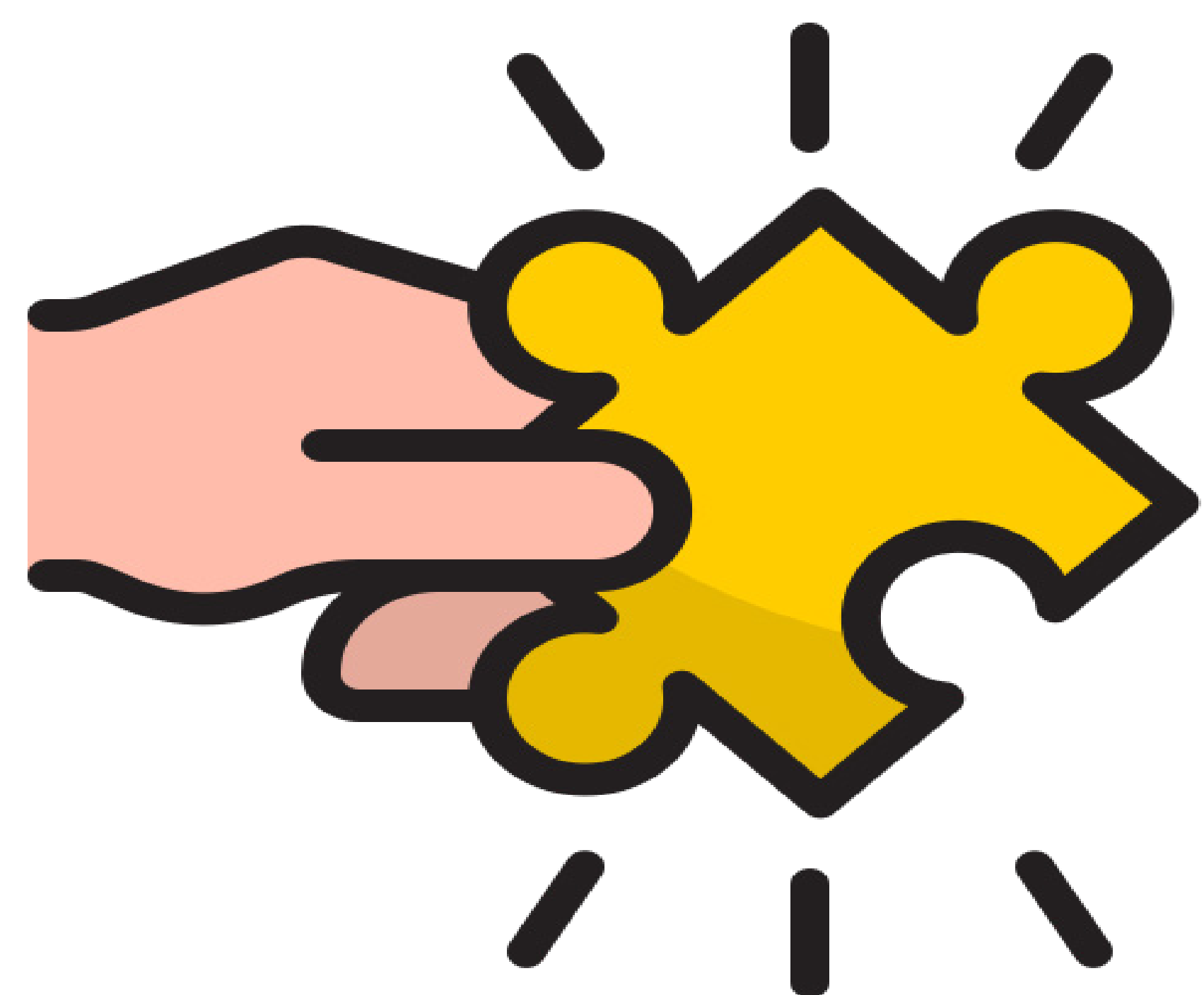
BLUETOOTH BEACON TECHNOLOGY

A beacon is a small Bluetooth radio transmitter, powered by batteries. These small hardware devices incessantly transmit Bluetooth Low Energy (BLE) signals. The Bluetooth enabled smart-phones are capable of scanning and displaying these signals.

1



bluetooth beacon



interaction

2

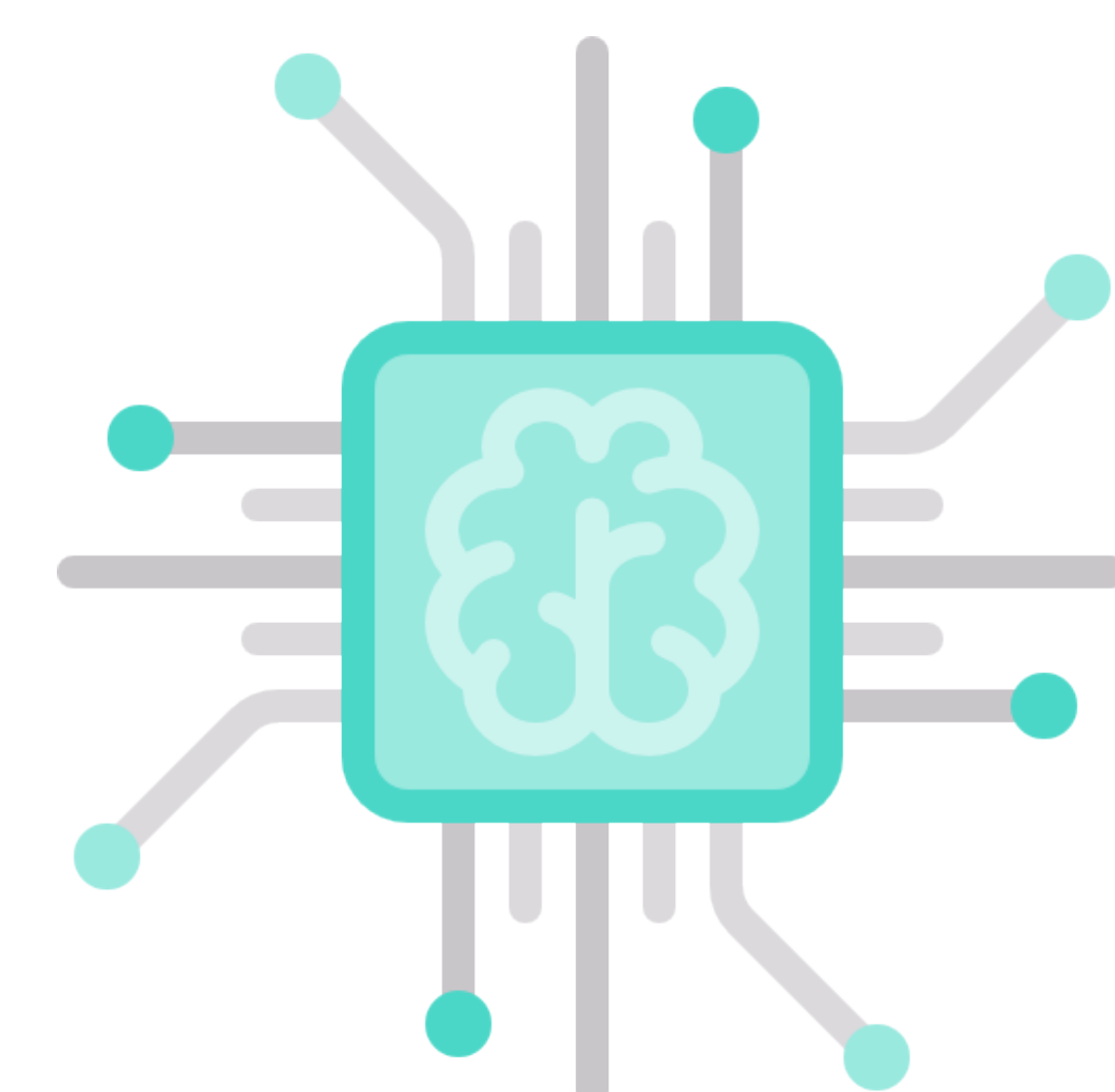
HOW DO END-USERS INTERACT WITH A BEACON?

When messages are assigned to a beacon, it broadcasts to Bluetooth-enabled smartphones in its proximity. Android phones can instantly receive message through NearBee that is built to scan these signals and display it . iPhones require a beacon powered app or a separate third party application, such as Nearbee, to do the same.

HOW TO REPRESENT A ROBOT WITH BLUETOOTH BEACON TECHNOLOGY?

The mechanism will be represented by an algorithm which is set of instructions designed to perform a specific task

3



how to use it?

Sometimes algorithms are written using pseudocodes
(language similar to the programming language to be used)

Explain algorithm of robot with Bluetooth beacon as pseudocode:

I: number of mac addresses of smartphones

(means number of people)

n: maximum number of mac address in the range of beacons
(that cause crowding)

sum \leftarrow 0

While $n \geq$ sum do

sum \leftarrow sum + I

If sum=n then

play voice “mp4”

Else

No action

End if

End while



As an example,

n=8 maximum number & i=4 mac addresses (means 4 persons)

final step for loop be like:

sum \leftarrow 3

While 8 \geq 3 do

3 \leftarrow 3 + I // add one mac address

If sum=n then // skip this condition because sum doesn't equal n

play voice "mp4"

Else

No action // true

End if

End while

Another example,

n=8 maximum number & i=8 mac addresses (means 8 persons)

final step for loop be like:

sum \leftarrow 7

While 8 \geq 7 do

7 \leftarrow 7 + I // there is another mac address added

If 8=8 then // the condition applied sum= n(max number)

play voice "mp4" // this will be caution for people there is

crowding

Else

No action

End if

End while

Writing algorithm using natural language



- 1: start
- 2: adjust beacon bluetooth setting with robot
- 3: count number of mac addresses that in range of beacon
- 4: if that number $> n$ (which means max number for crowding)
notify robot that there is crowding
play voice mp4 (keep social distance beatween each other)
- 5: if number doesn't equal n then go back to step 3
- 6: end



Natural Language

Writing algorithms using flowchart diagram

