

# NAO Project

## Social Assistive Robot

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WiTNY COLLABORATIVE PROJECT



# RESEARCH MOTIVATION

## Goal:

Social Assistive Robot,

Work collaboratively with professionals to provide assistance for:

- People with hearing /speech impairment
- Rehabilitation at home
- Children with cognitive disabilities

## Reason:

Cost-effective and provide emotional support and companion.

Gain confidence

Reinforce memory building through interactive games

Assist the elderly in doing simple tasks efficiently



## NAO's best features

He's a little character with a unique combination of hardware and software

### Audiovisual input

NAO is equipped with a pair of cameras and can perform facial and object recognition; a suite of four directional microphones enables him to decipher where sounds originate from and recognise voices.

### Vocal synthesiser

Includes text-to-speech capabilities for internet recital; able to communicate in 19 different languages.

### Sonar system

NAO judges distances to nearby objects and obstacles using a pair of ultrasonic transmitters (top) and a pair of receivers (bottom) that analyse the time it takes for inaudible sound pulses to bounce back.

### Prehensile hands

Enable NAO to grasp and manipulate objects. A trio of capacitive touch sensors in each hand let him know when he has a good grip on something without crushing it.

### Infrared transceiver

Permits wireless communication with other NAOs or infrared-enabled devices.

### Tactile sensor

Communicate with NAO via touch: press once to shut down, or program the sensor as a button that triggers specific actions.

### 'Brain'

Main CPU, running dedicated NAOqi operating system, enables NAO to interpret and react to data received by his sensors and provides wireless connectivity.

### Inertial measurement unit

Includes an accelerometer and a gyro to let NAO know whether he's standing, sitting, or in motion.

### Feet

Equipped with noise damping soles for a quiet walk and tactile sensors for interacting with objects and obstacles.

### Motorised joints

With 25 degrees of freedom and sensors to stabilise his walk and resist small disturbances.

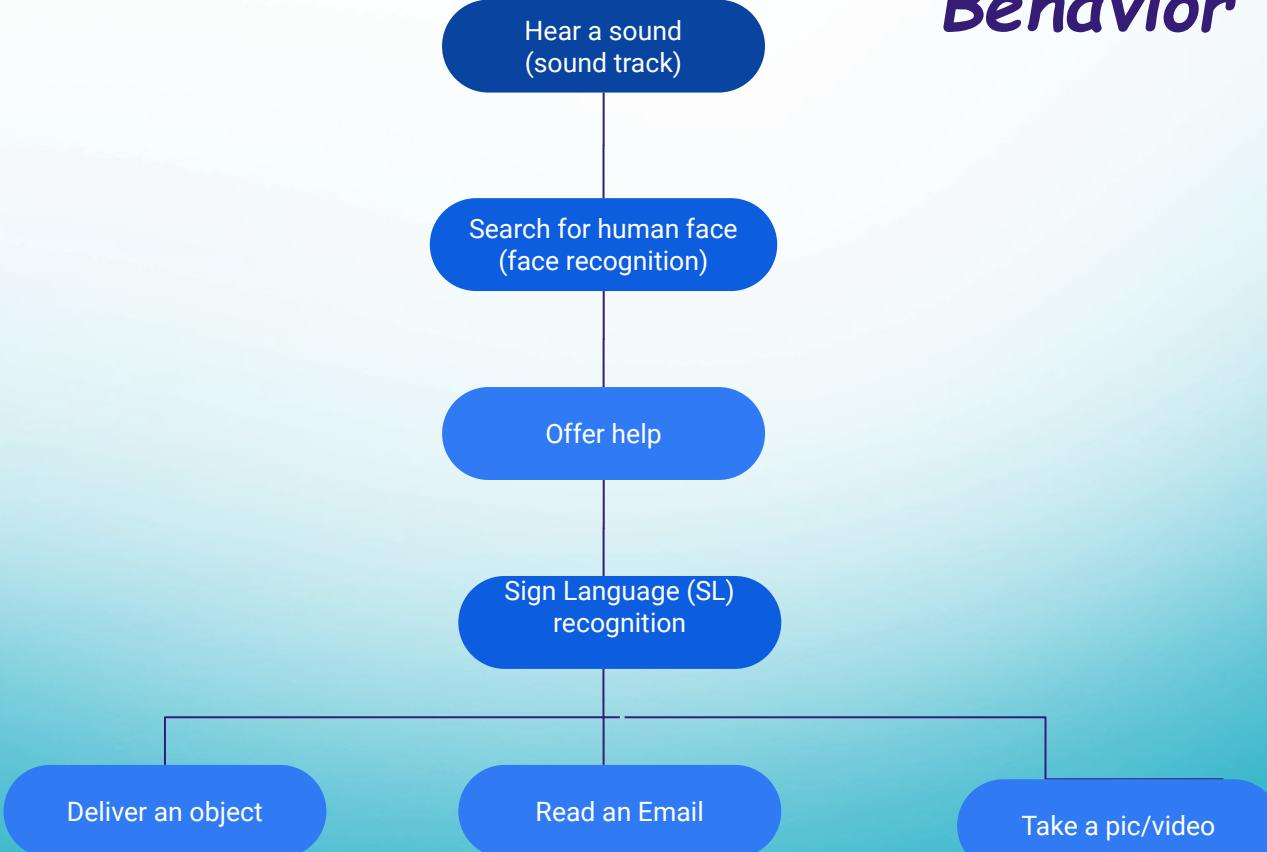
# HOW IT WORKS

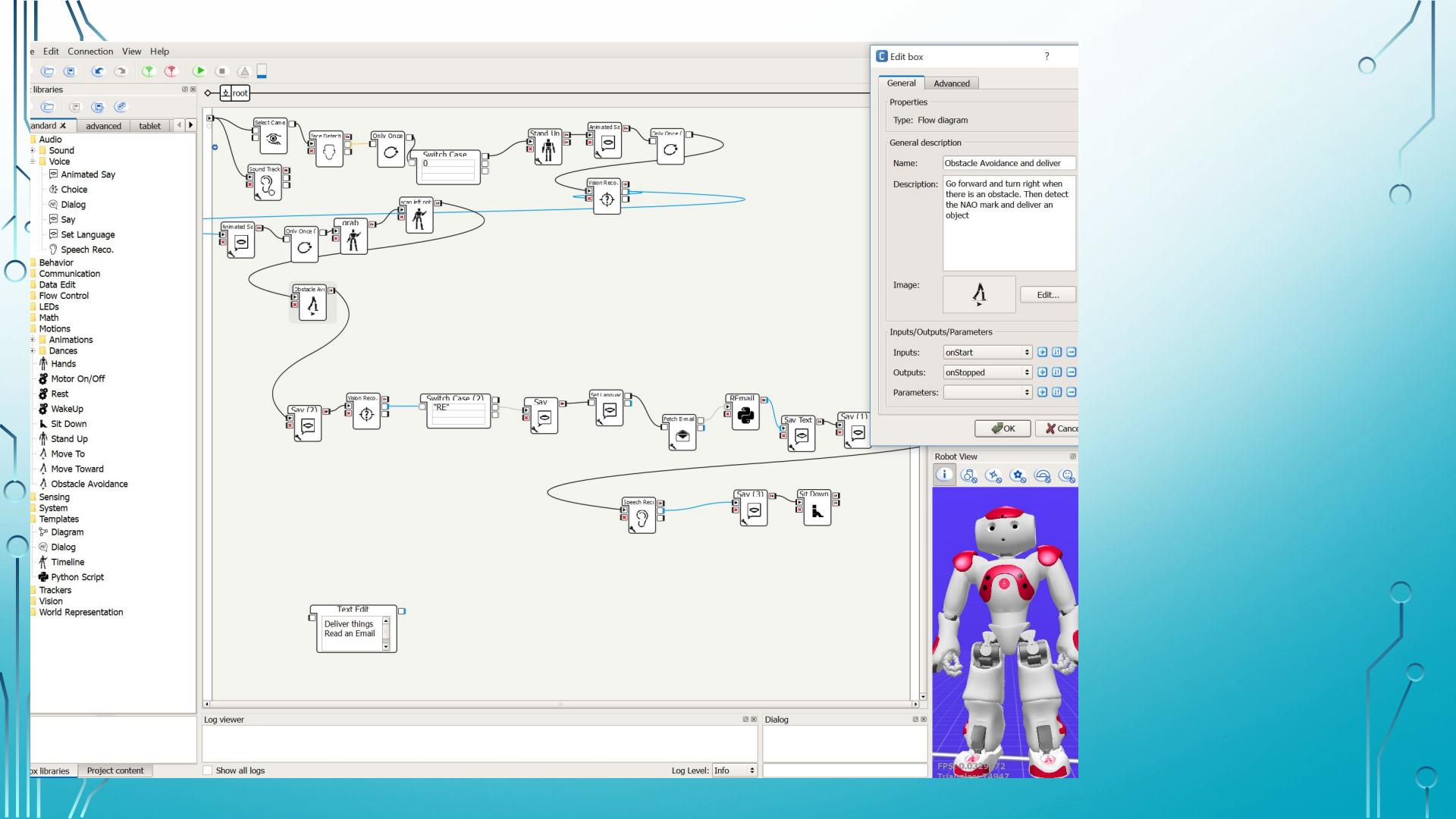
# HOW IT WORKS

# Interaction with NAO by Sign Language

- Help to deliver objects
- Read the new coming Email
- Take a picture/video for emergency

# Behavior Design

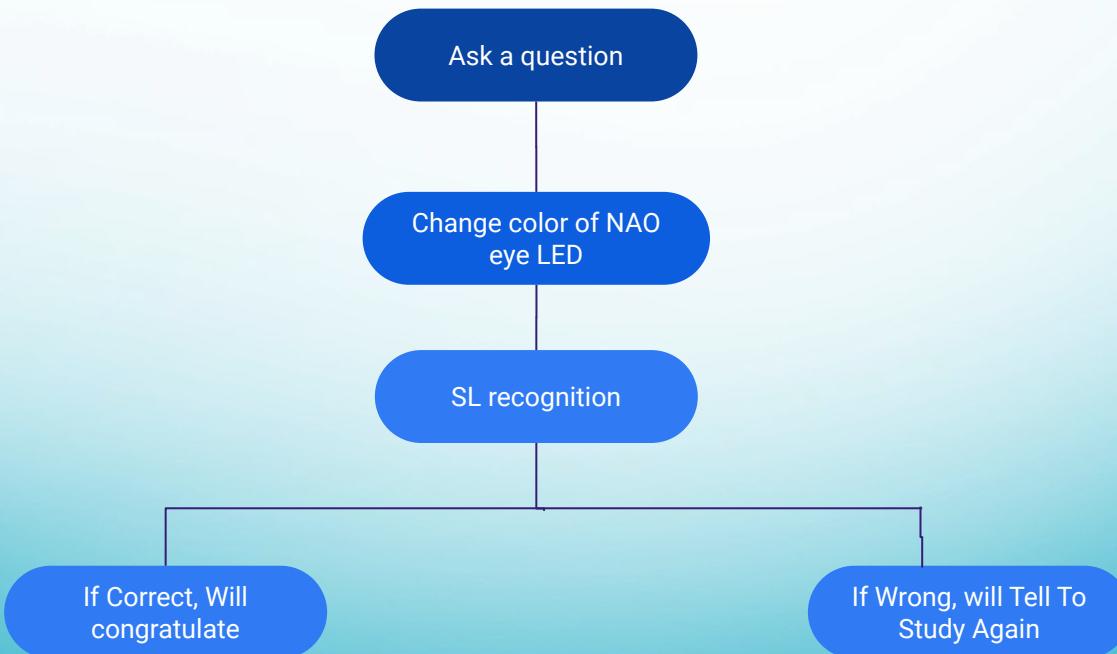




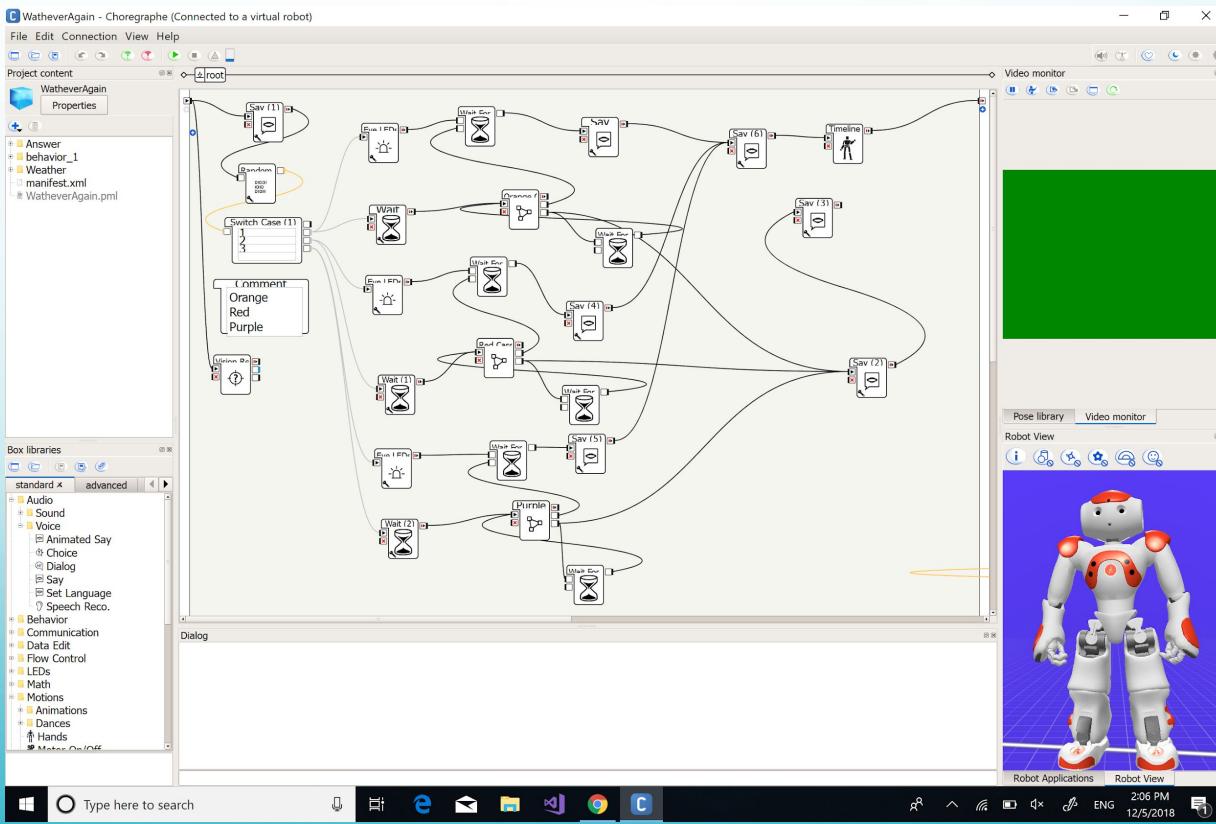
# NAO Teaching Sign Language Through Interactive Game

- Learn Math
- Learn Color

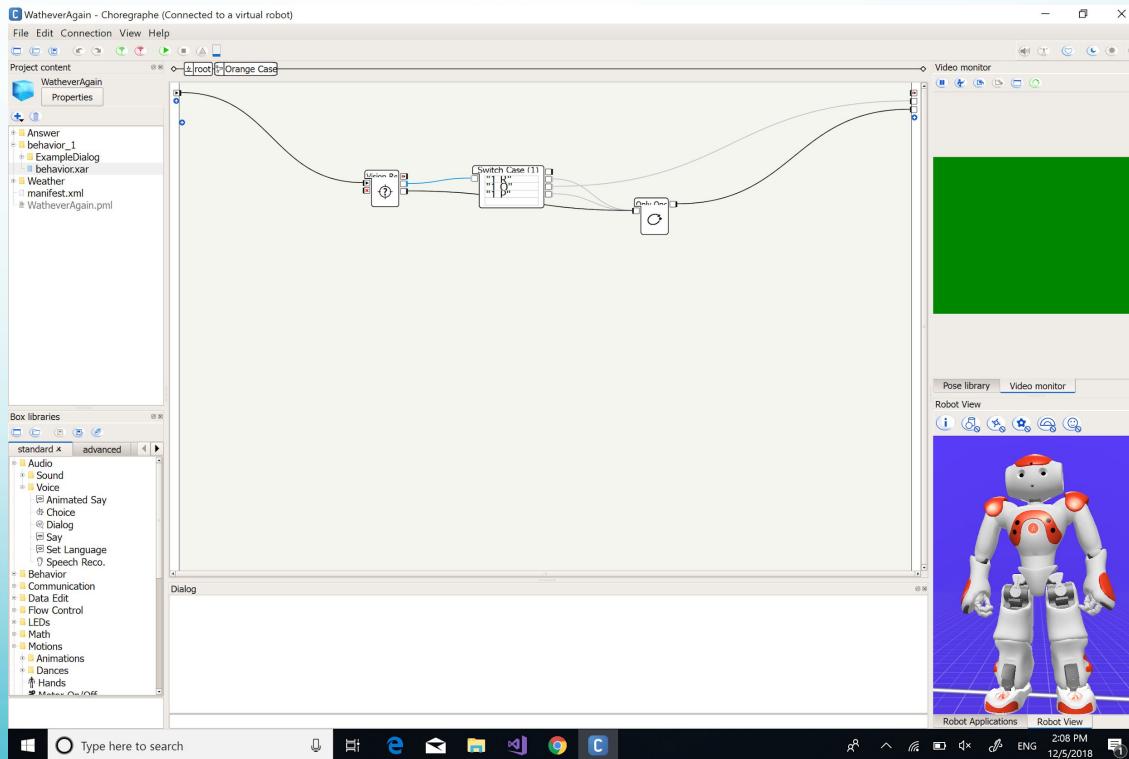
# *Learn sign language with color*



# Code



# Code



# Mirroring Movements for Multiple Robots

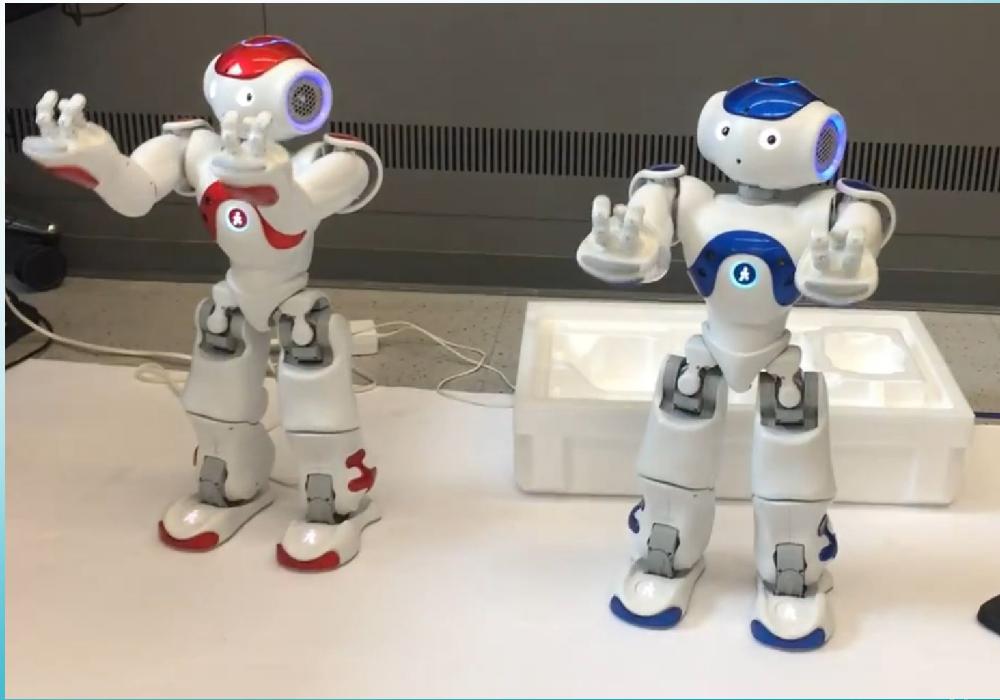
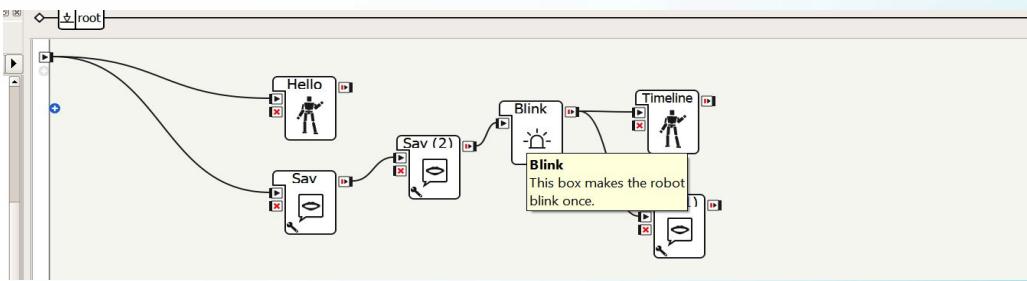
- Rehabilitation at home
- Remote physical therapy

```

from naoqi import ALProxy
memProxy = ALProxy("ALMemory","192.168.1.27",9559)
clientMotionl = ALProxy("ALMotion","192.168.1.24",9559)

serverMotion = ALProxy("ALMotion","192.168.1.27",9559)
names="Body"
stiffnessl=0.6
stiffness0
timeLists=0.05
isAbsoulte=True
sensor = True
speeds = 0.2
while(1):
    data0= serverMotion.getAngles(names,sensor)
    clientMotionl.setAngles(names,data0,speeds)

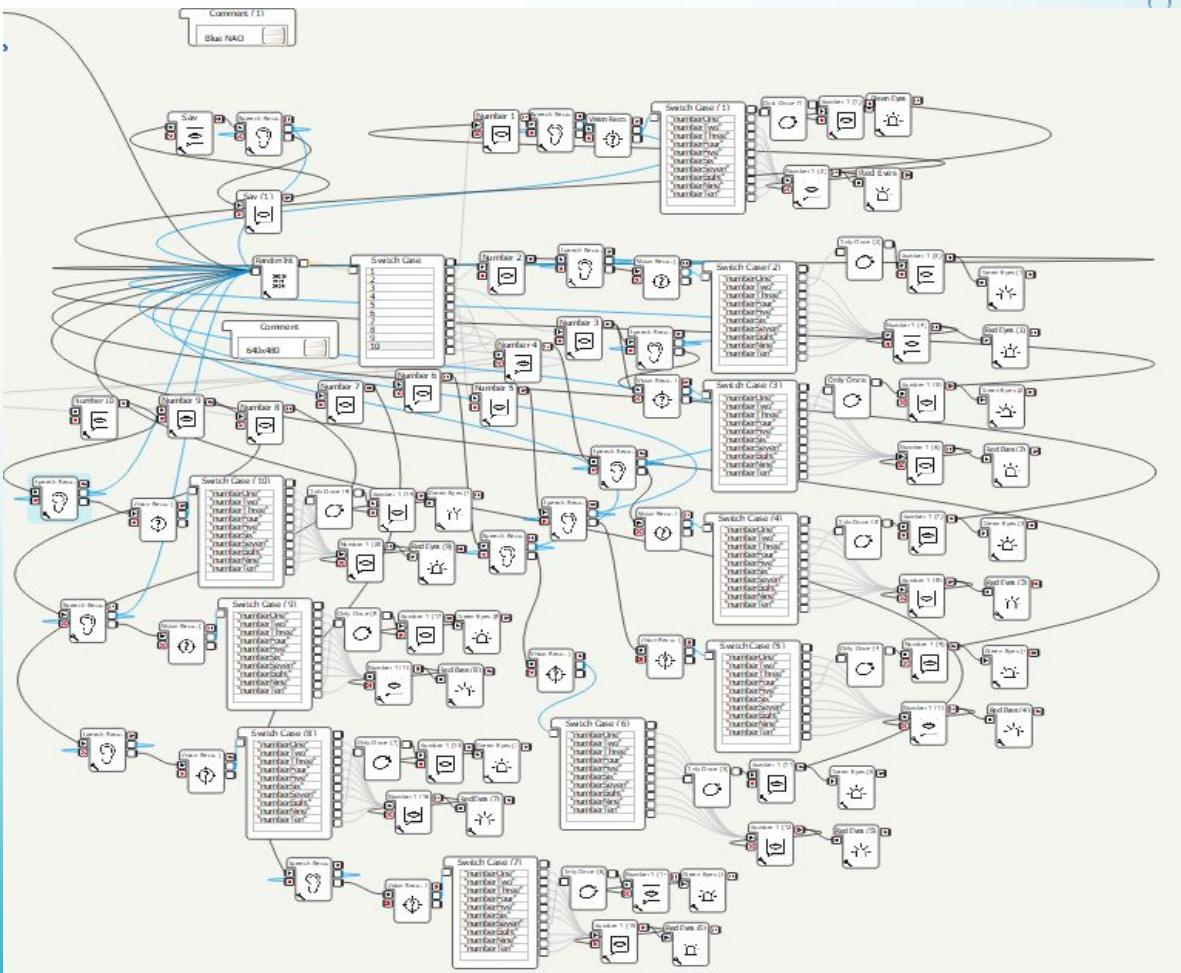
```



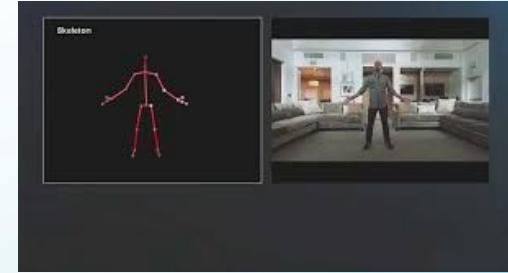
# Math Game

By Aleena Tim

# SIGN LANGUAGE NUMBERS



# Future Plan



Thank you

# Reference

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