## Project Number - 12a

Subject:	Commanding MiRo with natural language [Project 12a]					
Supervisor(s)	Yusha Kareem ( <u>kareem.syed.yusha@dibris.unige.it</u> ) Antony Thomas ( <u>antony.thomas@dibris.unige.it</u> ) Luca Buoncompagni ( <u>luca.buoncompagni@edu.unige.it</u> )					
Estimated group size	6 students					
Equipment:	1. STEREO EYESIGHT Cats have the edge when it comes to eyesight. MIRO's eyes are colour sensors, similar to those used in mobile phone cameras.  2. TOUCH SENSITIVE Just as a dog responds to stroking, so stroking MIRO's back is one way you can engage with and alter MIRO's emotional state, which is reflected in MIRO's expressive behaviour.  3. LIGHT SENSITIVE A mouse might scurry for cover when a light is switched on: MIRO can sense the difference between light and dark switched on: MIRO can sensors help to ensure that he will not topple of a table will not topple of the table will not topple of a table will not topple of the table will not topple of a table will not topple of the table will not topple of the table will not topple of a table will not topple of the table					
Description:	thanks to light sensors.  or down a flight of stairs.  Experimental setup:					

## **Description:**

## **Experimental setup:**

Consider some <u>small</u> objects (sphere, box, cone etc.) kept around MiRo. **Objective**:

MiRo starts listening for a key-phrase when it hears the word "MiRo!". As it hears a key-phrase (e.g., "go close to the ball", "go close to the small green ball" etc.), it converts speech to text and understands the key-phrase using Google's DialogFlow. MiRo then recognizes the object of interest, it's colour and the action that MiRo needs to take with respect to that object of interest.

As MiRo executes an action, emotional-colors on MiRo (i.e., behaviour of MiRo) allow the user to know (i.e., get feedback) about whether (1) MiRo understood the command, (2) is executing the action, and (3) has completed the action or not. Once the action is executed, MiRo goes into a state of 'natural social behaviour' while it waits for a new command. While it does an action, it's not necessary for MiRo to know its own location, i.e., MiRo simply move based on its vision. MiRo's movement can be supported by 'overriding' it using teleoperation from a keyboard.

SDK of MiRo (https://github.com/EmaroLab/MiRo-training).

Architecture of previous SofAR project

(https://github.com/buoncubi/speech based teleop commander).

Speech to Text (https://cloud.google.com/speech-to-

<u>text/)(https://github.com/buoncubi/speech\_based\_teleop\_commander</u>) and DialogFlow(https://dialogflow.com/).

MiRo behaviour (https://github.com/EmaroLab/miro behaviour config) and ROS state machine (http://wiki.ros.org/smach).