Spring Semester 2020 Research

Project: Reachy

Using Computer Vision to make a Robot social

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MOTIVATION

Social robots are highly popular for human-robot-interaction for educational purposes. One main aspect of social robotics is to enable a robot to perceive verbal and non-verbal cues and adapt its behavior accordingly. Being able to process images is a key feature to perceive such non-verbal cues.

METHODS

I implemented a python library named ReachyVision to serve as an interface between the API of Pollen Robotics humanoid robot Reachy and functions needed to make a robot social. Using openCV and a pre-trained face detector, Reachy is able to detect a face within its field of view and look at it. To test the interoperability between my library and functions needed for social robotics, I developed a prototype for an attention system. An attention system processes the environment perceived by a robot and changes the focus of the robot accordingly. In my prototype, Reachy will keep looking at a person, and as soon as a new person enters the field of view, it will look at the new person that entered the image.

RESULTS

The ReachyVision library offers modular computer vision functions intended to be used with Reachy. The library can also be used for other purposes than social robotics, but it still remains the main goal. The attention system developed is very adaptable and can be adapted to any framework, in particular for educational purposes.

Link to the code repo and report: (insert link here)