

ECE 410/510 Final Project: Monkey and Banana Experiment

Sam Burkhart Matt Fleetwood Armaan Roshani David Hernandez

Portland State University
Maseeh College of Engineering and Computer Science
2018
May



Figure 1: Image of tired monkeys.

Source: Goolge Images

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1 Abstract

The purpose of this project is to re-create a classic experiment in robotics and Artificial Intelligence (A.I.) known informally as the monkey and banana experiment. Here, we detail how Prolog can be integrated into Python in order to conduct this experiment. Prolog is used as a representation for the robot's world knowledge and as a means to determine what the robot needs to do next. Python is used to query Prolog. A vision system using OpenCV and Aruco markers determines where relevant objects (e.g. the soda container, the ramp, the box, etc.) are located. Python uses this information to query a Prolog program, which provides the direction (such as left, right, backwards, forwards, and so on) the robot should take in order to acquire the goal object. In this case, the goal is a tall soda container. We used Python sockets for sending commands to the robot.

2 Background

Traditionally there are at last two major types of programming languages: declarative and procedural. Prolog, or Programming Logic, is used as a declarative language. In contrast, Python can be used in a procedural style. This means instead of describing what the program should do to solve a problem, a description of how the program should solve the problem is provided instead.

The banana and monkey experiment is discussed in the Braitko text, Chapter 2.

3 Experiment Procedure

We attempt to re-create the original banana and monkey experiment by using a donkey car robot, a box, a ramp, Prolog for the hierarchy of rules, and Python for Input/Output (I/O).

4 Results

The results of this experiment show at least one contemporary approach to solving the classic robotics problem of the banana and monkey. All designs,

documents, and source code and be found on out GitHub [here](#). A YouTube link to our video can be found here.

References

- [1] Braitko book
- [2] Aruco tutorial(s)
- [3] Prolog citation for background section?