Rock paper scissors robot hand

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Abstract

Rock Paper Scissors is one of the most recognizable, easy, and popular hand games out there. And while it is sometimes fun to play as a last resort in an incredibly boring situation, winning roughly 50% of the time isn't good enough for us. We want to not only win, but crush the competition. Humans are terrible at being random, and we want to make a robotic hand to exploit this human weakness.

Over the course of this semester, we have created a robotic hand that will beat humans at rock paper scissors. By using OpenCV, the Multi Armed Bandit Problem, and some open sourcing from rpscontest.com, we were able to create a program that can recognize the human's move and calculate the best strategy against it. And with 3D printing, some servos and basic electronic parts, we created a basic robotic hand that utilizes a Raspberry Pi and Arduino to make the move to crush the human, in the game.

Index Terms

rock, paper, scissors, robot hand, OpenCV, machine vision, cues, machine learning, Raspberry Pi, Arduino, 3D printing, multi-armed bandit problem