

# CSCI 3302: Introduction to Robotics

## Homework 3: Color Filtering & Blob Detection

**Due Date: 5:00pm Dec 3, 2021**

Using the base code, implement the functionality required for color filtering (25%), blob expansion (30%), centroid computation (25%), and location of all 4 lego blocks (20%). A recursive implementation of blob expansion is provided as a reference to help you, though you will have to implement a non-recursive version. You may use numpy or any math library you prefer, though suggestions are provided inline. **You are not permitted to call color filtering methods or blob detectors from other packages to implement your own (i.e., you may not just write a wrapper that calls someone else's implementations).**

The provided Python file will display the image, image mask, and blob centers from your algorithm. **You can close the program after it renders its results by pressing a key while one of the program windows is in focus.** After implementing the empty functions (they have TODOs in them), make sure to add the color ranges necessary to locate the four lego blocks in the provided image (there are red, blue, green, and yellow blocks) with the `add_color_range_to_detect` function (see lines 167-169).



Sample output from a successful blob detection implementation with four appropriately selected color filter ranges (one for each block).

**Time to complete:** This assignment should take less than 2 hours to complete. Please reach out for assistance if you get stuck or find yourself spending more time than this on implementation.

**To Submit:** Your fully implemented python file. (IPython notebooks, zip files, etc. are not permitted)

**You are to complete this assignment without collaboration**