# Socket’s type recognizer

By Amit Shraga & Tomer Tal

Sockets Type Recognizer.py

# Socket's Type Recognizer

please upload the photo of the Sockets you wish to recognize

make sure there is only one Socket in the image

Upload Image

Successfully Recognized Socket as Type H

Type H - Israel, the Gaza Strip, and the West Bank

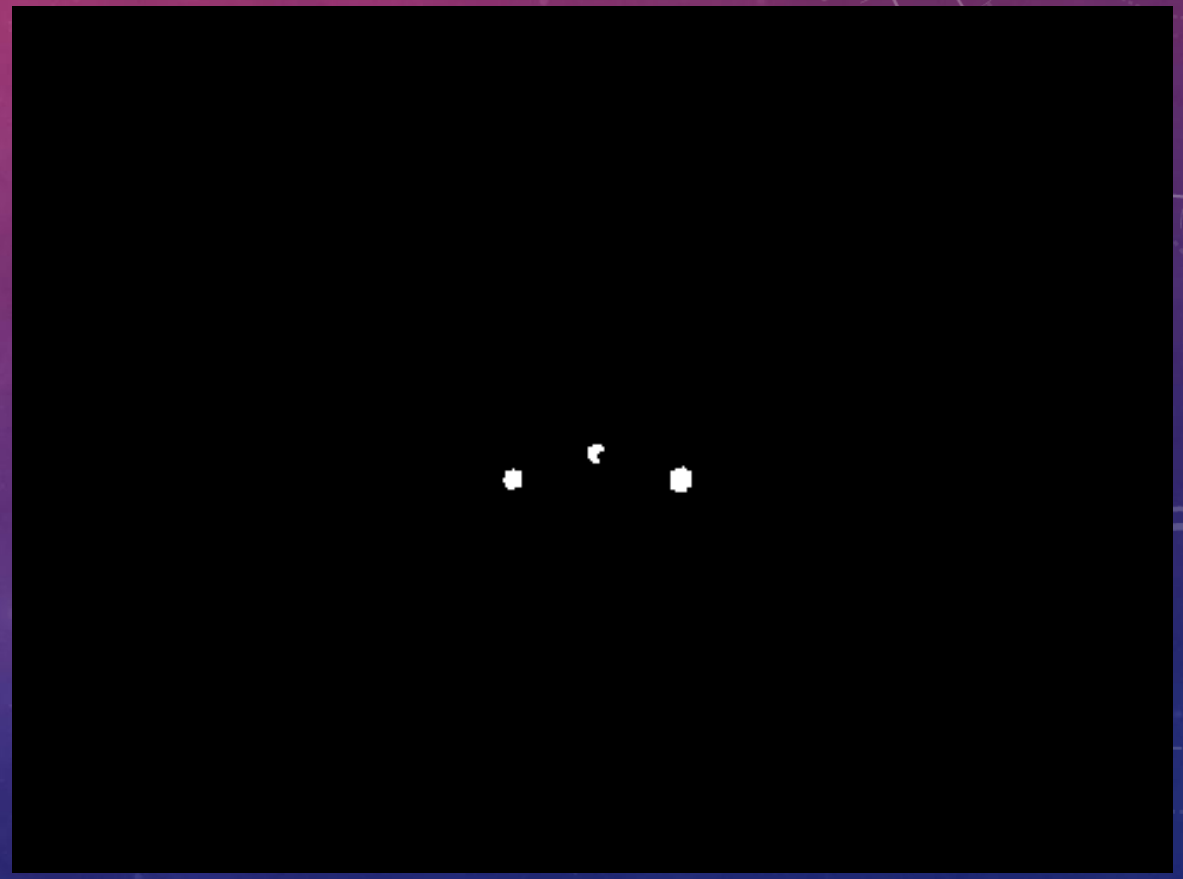
# MAIN STEPS

- Resize and crop the main object (Socket)
- detect the holes
- Classify if hole is circle or rectangle
- Find relation between the holes to determine the socket’s type

# RESIZE AND CROP THE MAIN OBJECT (SOCKET)

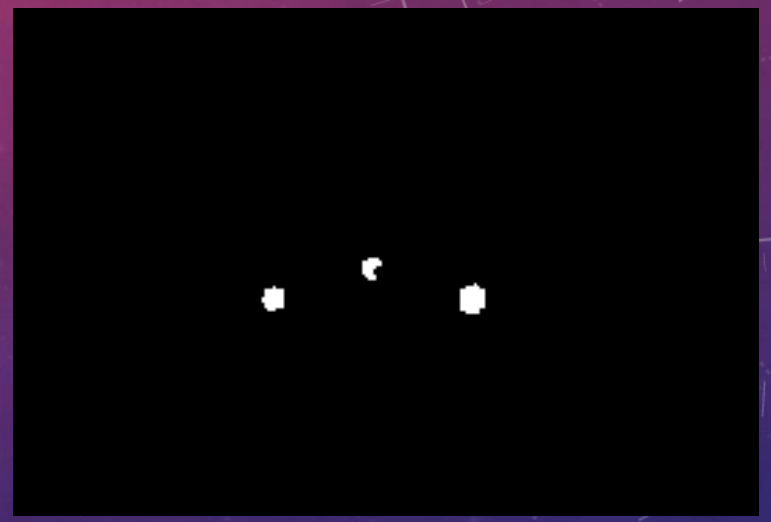
# DETECT THE HOLES

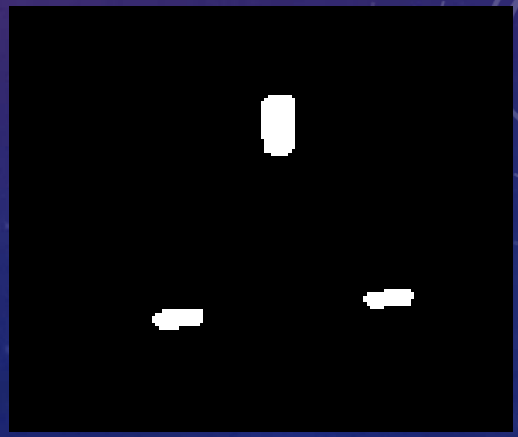
- Guide line – the holes are black,
  The rest is white
- Threshold
- find contours
- Check number of contours



# CROP THE HOLES AREA, PROCESS THE IMAGE

- After finding holes, crop for proccing
- Use bigger threshold
- Classify if circle or rectangle (using cv2.approxPolyDp)

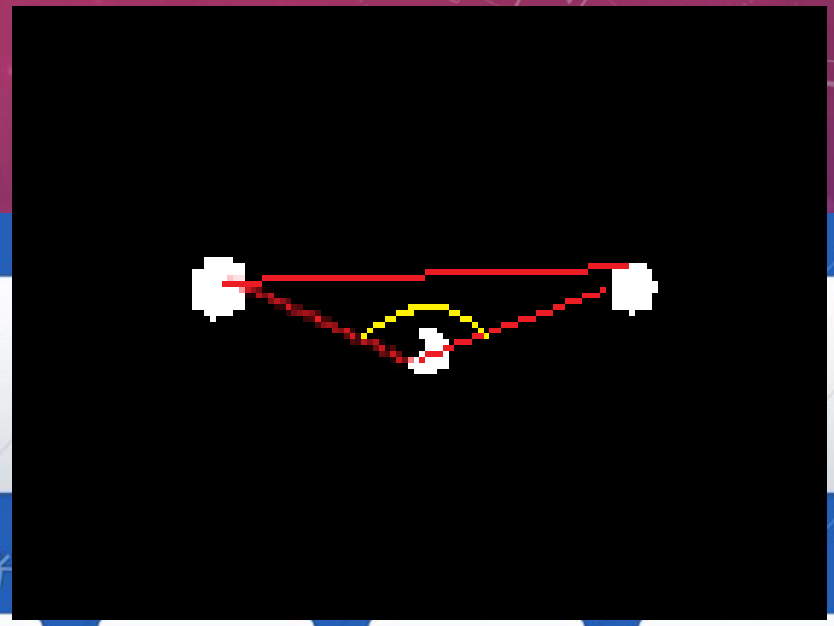




# FIND RELATIONS

```
        if is_Three_linear(points[0], points[1], points[2]):
            return "L"
        elif has_one_bigger_hole(radii[0], radii[1], radii[2]):
            return "D"
        else:
            if up_or_down(points[0][1], points[1][1], points[2][1]) == 'Down':
                if has_big_angle(points):
                    return "N"
                else:
                    return "H"
            else:
                return "O"

    elif len(rectangles) == 3:
        y_points = []
        for contour in contours:
            (x, y), radius = cv2.minEnclosingCircle(contour)
            y_points.append(y)
        G_or_I = up_or_down(y_points[0], y_points[1], y_points[2])
        if G_or_I == 'Up':
            return "G"
        else:
            return "I"
```



# QUESTIONS?