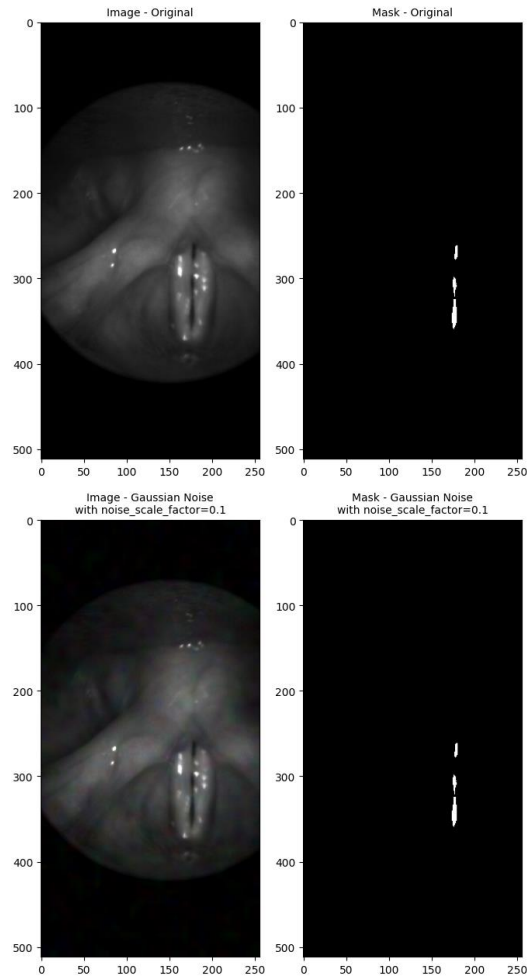
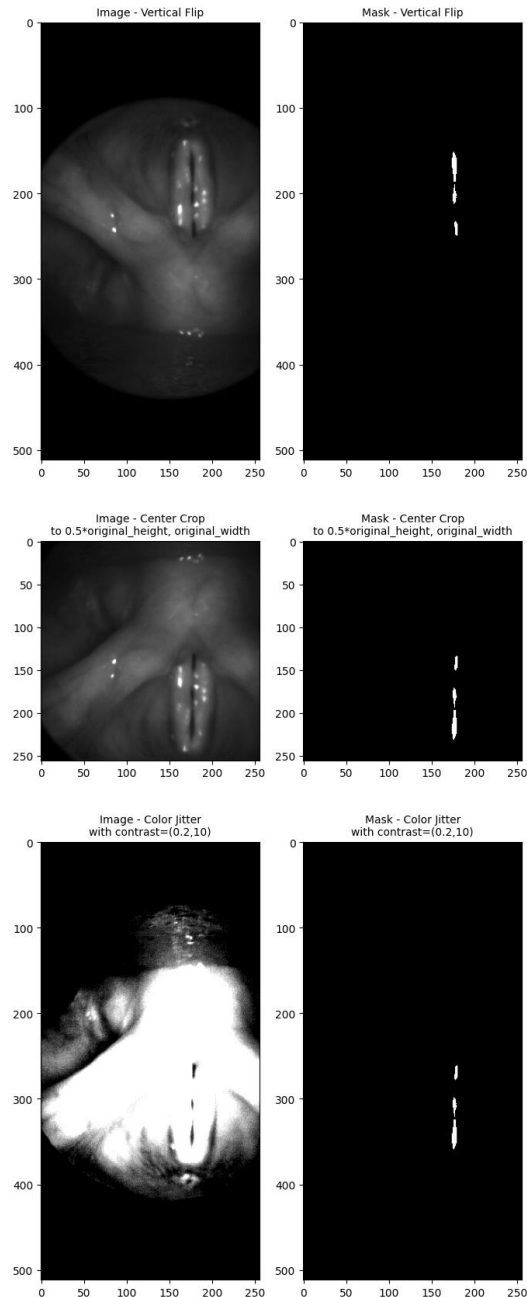


Homework 6



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```
def calc_intersection(rect1, rect2):
    x_left = np.max((rect1[0], rect2[0]), axis=0)
    x_right = np.min((rect1[0] + rect1[2], rect2[0] + rect2[2]), axis=0)
    y_bottom = np.max((rect1[1], rect2[1]), axis=0)
    y_top = np.min((rect1[1] + rect1[3], rect2[1] + rect2[3]), axis=0)

    if x_left > x_right or y_bottom > y_top: # no intersection
        return 0
    else:
        return calc_rect_area(x_left, x_right, y_bottom, y_top)

def calc_union(rect1, rect2):
    width_1, height_1 = rect1[2], rect1[3]
    width_2, height_2 = rect2[2], rect2[3]

    return width_1 * height_1 + width_2 * height_2 - calc_intersection(rect1, rect2)

def calc_rect_area(x_left, x_right, y_bottom, y_top):
    return (x_right - x_left) * (y_top - y_bottom)

def calc_iou(rect1, rect2):
    union = calc_union(rect1, rect2)
    intersection = calc_intersection(rect1, rect2)

    if union > 0:
        return intersection / union
    else:
        print('The area of the union of the rectangles is 0. The IoU-score is set to 0.')
        return 0
```

Distribution of IoU scores

