

ASSIGNMENT 2

1.

At minsize =50



2.

Threshold of 0.52 leads to:

- 8 false **positives** and
- 8 false **negatives**.

3.

Images

- Threshold = 0.52
- Minsize = 50
- Template width = 20

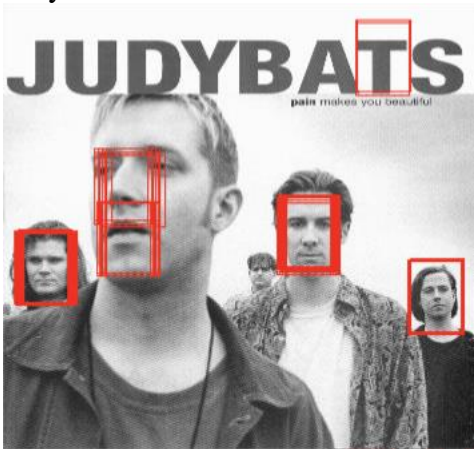
Fans = 3 faces



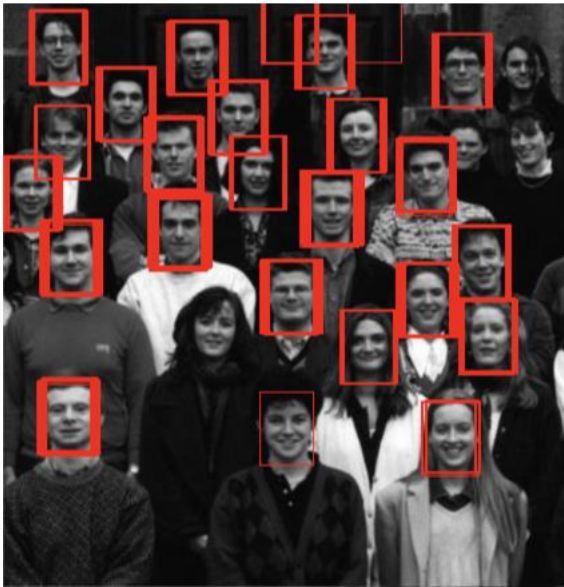
Family = 3 faces



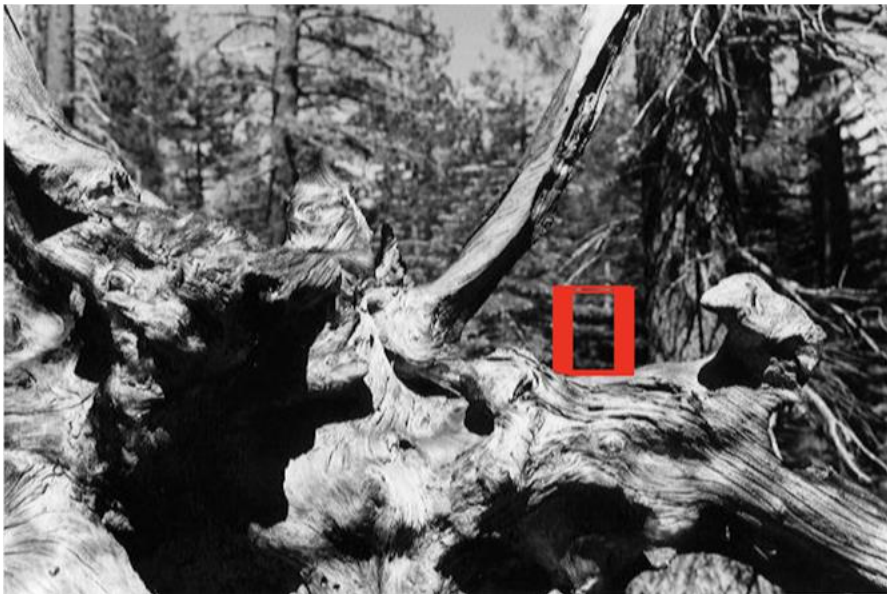
JudyBats= 5 faces



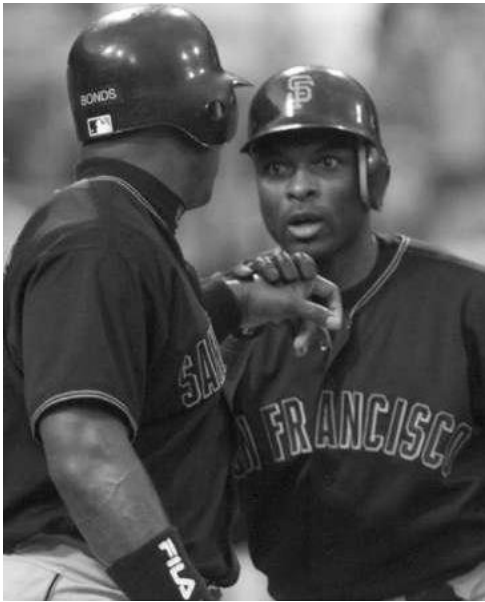
Students = 27 faces



Trees = 0 faces



Sports = 1 face



4. Precision = $tp / (tp + fp) = 30 / (30 + 8) = 79\%$
 Recall = $tp / (tp + fn) = 30 / (30 + 8) = 79\%$
 At a higher threshold, the ncc leads to a higher number of false negatives, thus increasing the recall rate in some image while providing a more precision in other images.
5. Tests for Q.5

```
threshold = 0.525

minsize = 50

# Fan IMAGE
fan_image = Image.open("/Users/gautamsoni/Desktop/CPSC 425/hw2/faces/fans.jpg")
pyramid = MakePyramid(fan_image, minsize)
ShowPyramid(pyramid)
template = Image.open("/Users/gautamsoni/Desktop/CPSC 425/hw2/faces/template.jpg")
FindTemplate(pyramid, template, threshold)

# Family Image
fan_image = Image.open("/Users/gautamsoni/Desktop/CPSC 425/hw2/faces/family.jpg")
pyramid = MakePyramid(fan_image, minsize)
ShowPyramid(pyramid)
template = Image.open("/Users/gautamsoni/Desktop/CPSC 425/hw2/faces/template.jpg")
FindTemplate(pyramid, template, threshold)

# JudyBats
```

```
fan_image = Image.open("/Users/gautamsoni/Desktop/CPSC 425/hw2/faces/judybats.jpg")
pyramid = MakePyramid(fan_image, minsize)
ShowPyramid(pyramid)
template = Image.open("/Users/gautamsoni/Desktop/CPSC 425/hw2/faces/template.jpg")
FindTemplate(pyramid, template, threshold)

# Students
fan_image = Image.open("/Users/gautamsoni/Desktop/CPSC 425/hw2/faces/students.jpg")
pyramid = MakePyramid(fan_image, minsize)
ShowPyramid(pyramid)
template = Image.open("/Users/gautamsoni/Desktop/CPSC 425/hw2/faces/template.jpg")
FindTemplate(pyramid, template, threshold)

# Tree
fan_image = Image.open("/Users/gautamsoni/Desktop/CPSC 425/hw2/faces/tree.jpg")
pyramid = MakePyramid(fan_image, minsize)
ShowPyramid(pyramid)
template = Image.open("/Users/gautamsoni/Desktop/CPSC 425/hw2/faces/template.jpg")
FindTemplate(pyramid, template, threshold)

# Sports
fan_image = Image.open("/Users/gautamsoni/Desktop/CPSC 425/hw2/faces/sports.jpg")
pyramid = MakePyramid(fan_image, minsize)
ShowPyramid(pyramid)
template = Image.open("/Users/gautamsoni/Desktop/CPSC 425/hw2/faces/template.jpg")
FindTemplate(pyramid, template, threshold)
```