Multimedia Systems
Term Project

Mutify

Image Mute and Censor Tool

Mert Can Balcı

Purpose

- Sometimes images may be annoying, disturbing, or an image might be uninsteresting for user. Mutify deals with that problem, Mutify gives an option to delete,blur or censor images that:
  - Includes image,
  - Is included by image,
  - Is exact same image,

  Which is given by user.

Operating Mechanism Step by Step

- Checks which operation is selected by user(Delete, Blur, Fuzzy)
- Takes an input image which contains unwanted image as .jpg file.
- Takes an input folder which contains images that is wanted to be scanned and muted.
- Apply Template Matching.
    - If no match found, rotate 90 and try again.
    - After rotation if any match found,
    - Apply Gaussian Blur if blur option is selected.
    - Apply Resize and Interpolation if fuzzy option is selected.
    - Delete the image if delete option is selected.

Mutify

Achieved Goals from Project Progress Presentation

- Improve matching algorithm ✓
  - Algorithm can also check rotations (90-180-270).
  - Algorithm can found not only image includes but also image is included.
- Adding alternative image censoring and muting options. ✓
  - Delete and Fuzz options are added alongside blur option.
  - Blur level option is added.
- Checking multiple images from a folder. ✓
- GUI Application. ✓

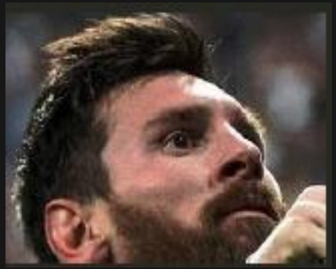
Mutify

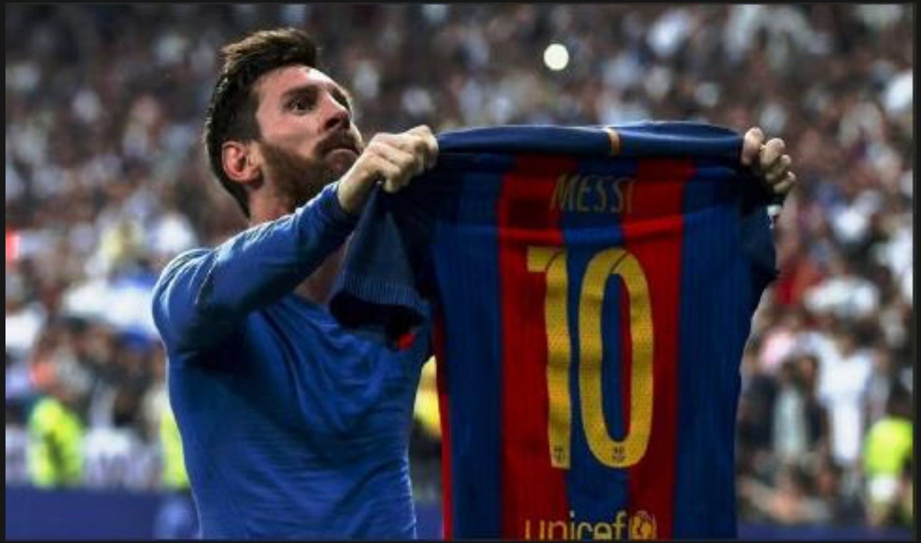
Template Matching

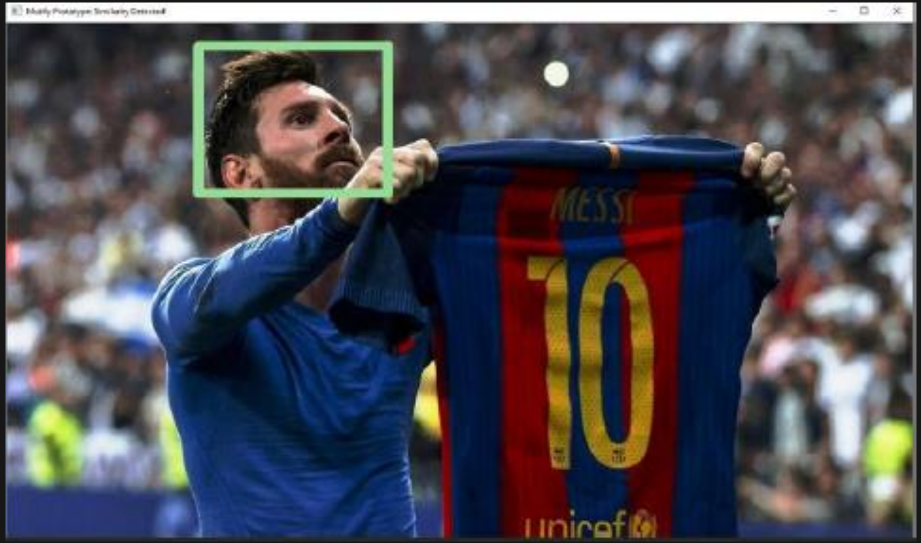
- Purpose: To find if two images are same or one includes another.
- Normally, fails to detect modified and rotated images.
- Matching criteria:
  - np.amax(match) > threshold

- Threshold is tried between 0.1 – 1 and 0.7 is the sweetspot for this tool.

Template Matching

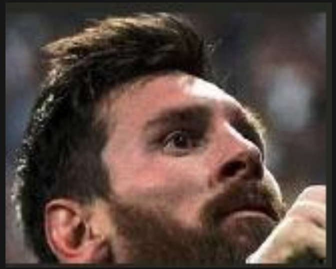


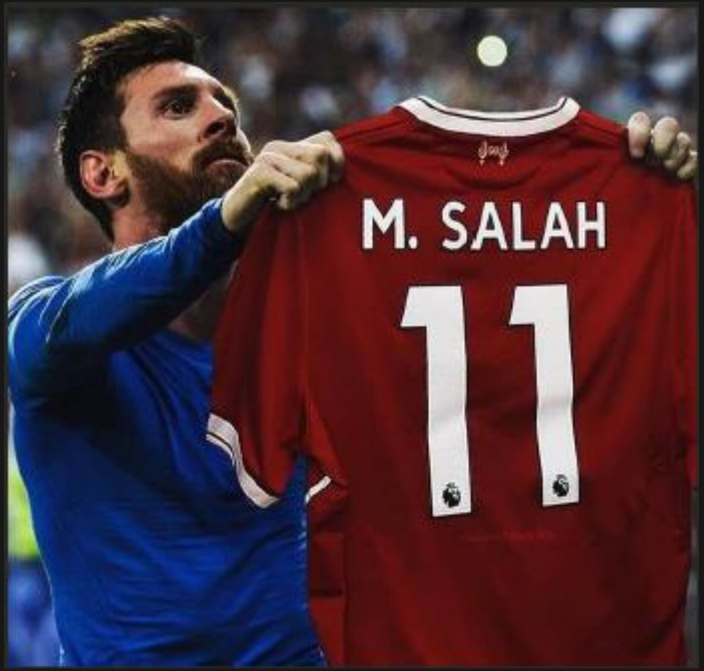


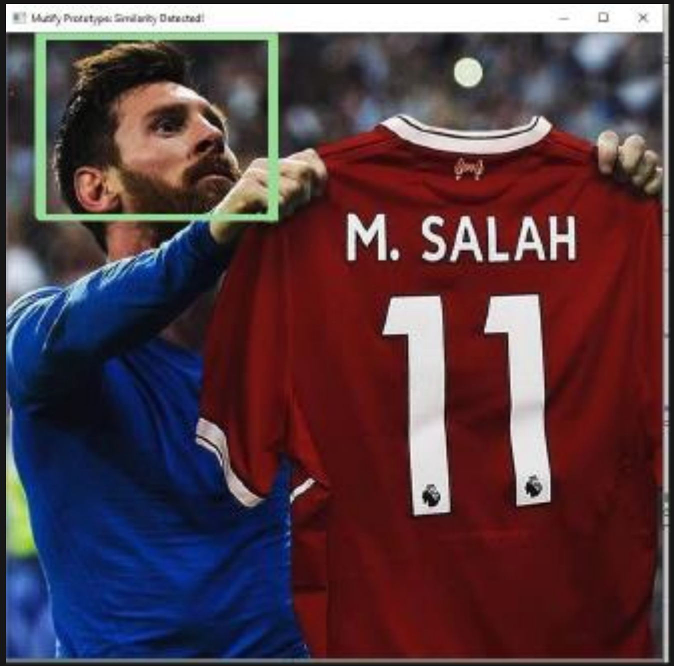


Mutify

Template Matching



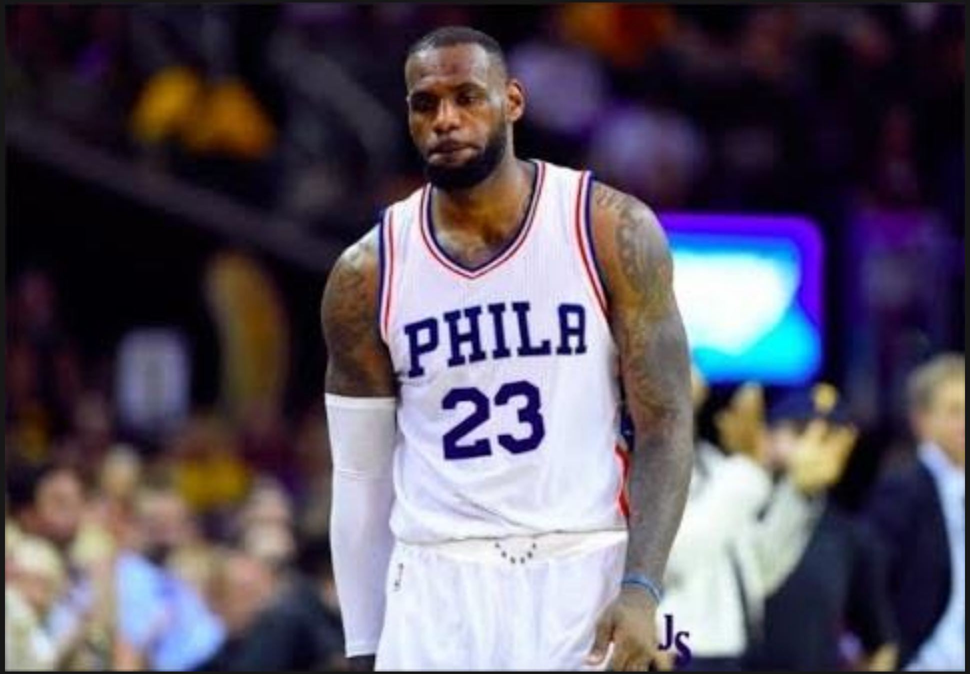


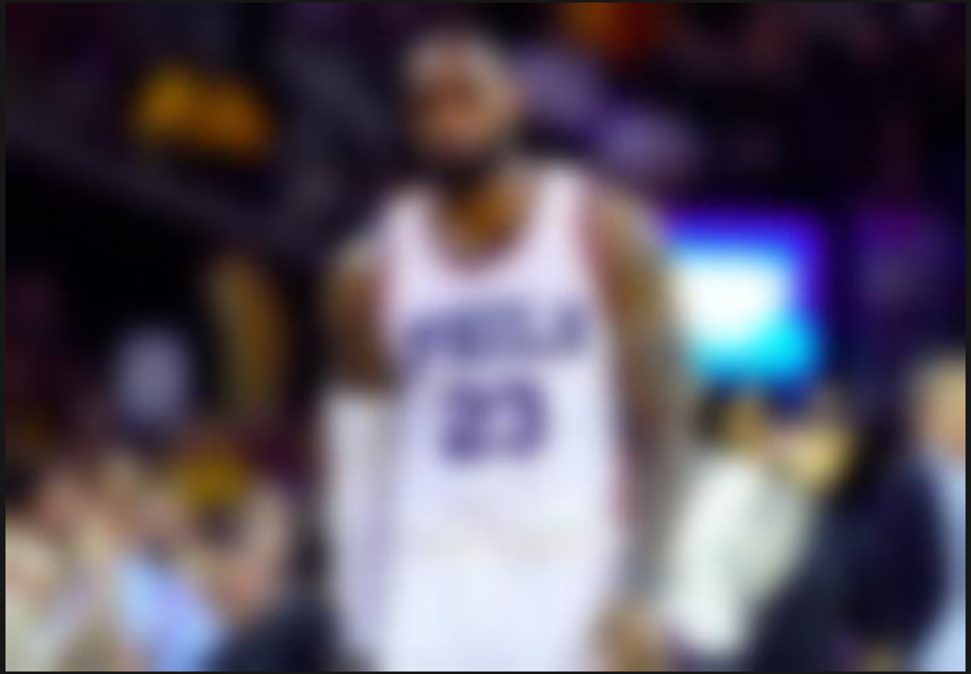


Gaussian Blur

- Purpose: To blur images if any similarity found.
- Can be adjusted with blur level.
- Gaussian Blur:
    - cv2.GaussianBlur(src, dst, ksize, sigmaX)
- src: Input image.
- dst: Output image.
- ksize: The size of kernel.
- sigmaX: Gaussian kernel standard deviation in X direction.

Gaussian Blur





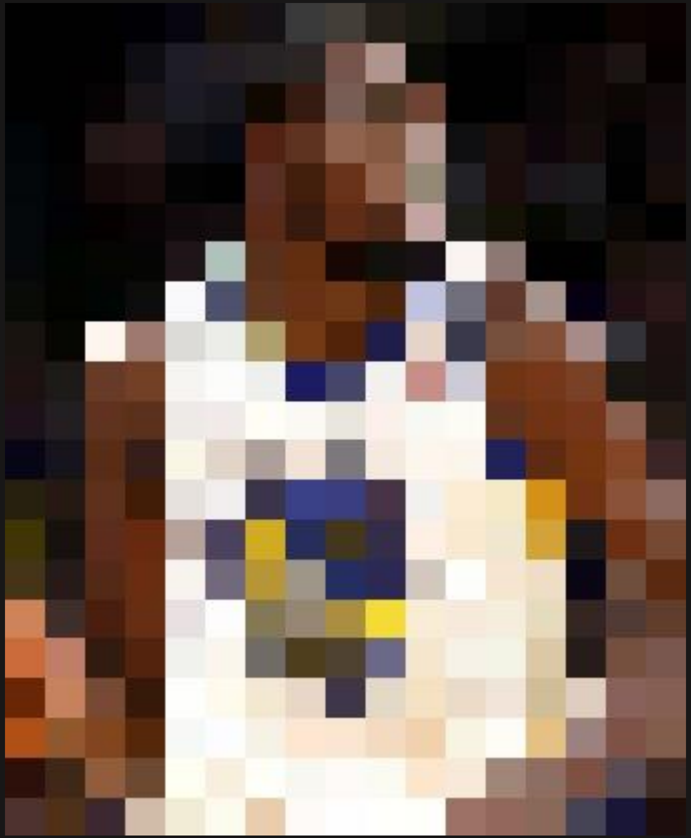
Resize and Interpolation

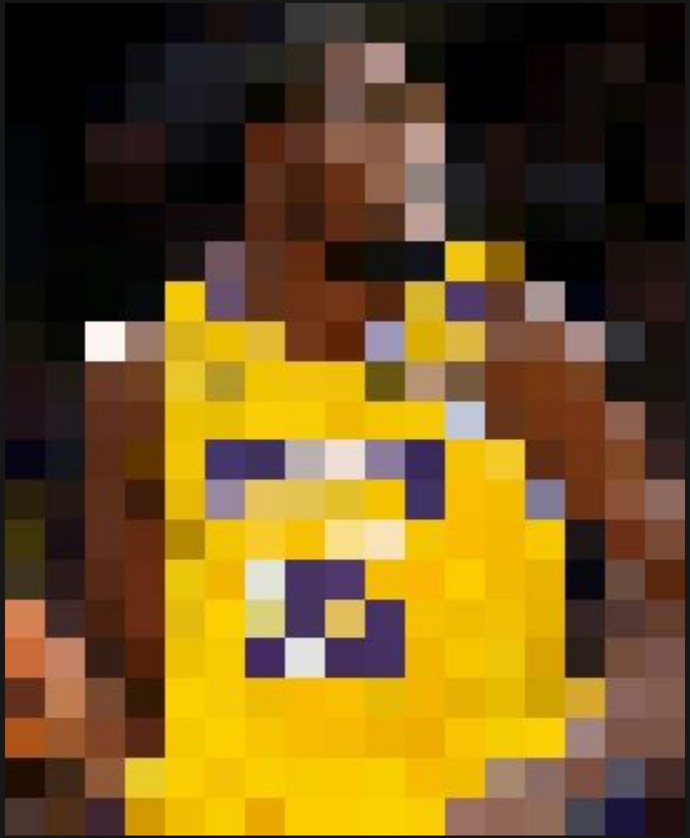
- Purpose: To censor images if any similarity found.
- Resize:
  - cv2.resize(src, dsize, fx, fy, interpolation)
- src: Input image(required)
- dsize: Size for output image(required)
- fx,fy : Scale factor for both axis.(optional)

- Interpolation(optional)

- INTER_NEAREST: A nearest-neighbor interpolation.
- INTER_LINEAR: A bilinear interpolation (used by default).
- INTER_AREA: Resampling using pixel area relation.
- INTER_CUBIC: A bicubic interpolation over 4×4 pixel neighborhood
- INTER_LANCZOS4: A Lanczos interpolation over 8×8 pixel neighborhood

Resize and Interpolation





Mutify

Results

- Simple:
  - Same, or including image with no to very little modification.
- Hard:
  - Very similar image with some modifications.

Type	Input	Success	Success Rate
Simple	60	55	91%
Hard	10	3	30%

Mutify