Fuse Detection System
# CS50 Introduction to python Final project

Video Link:

Introduction:

This program is made to detect whether the fuse in the image is okay or broken like shown below using **Rotation invariant Template matching technique**. It is basically a method for searching and finding the location of a template image in a larger image. Here we are using fuse template image and matching it with all the images and then we overlay results on the final image.
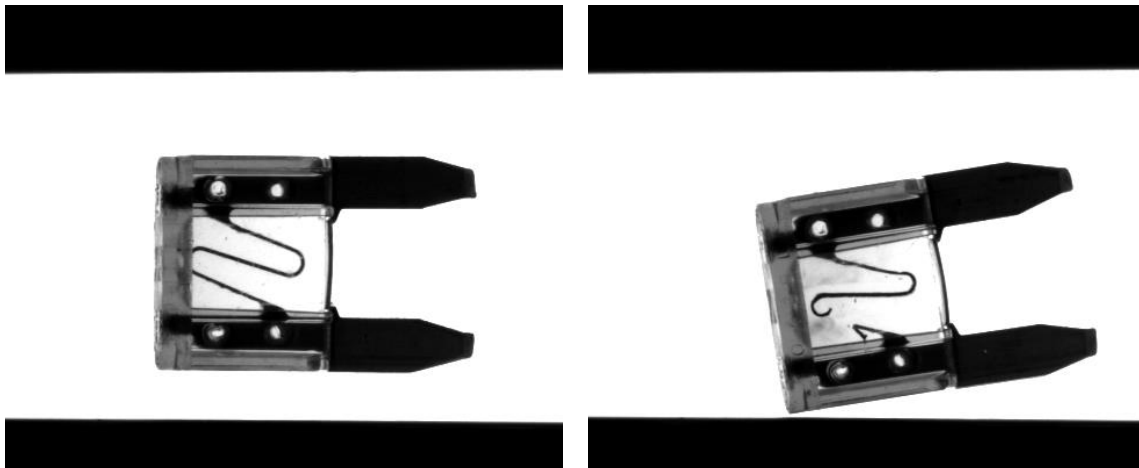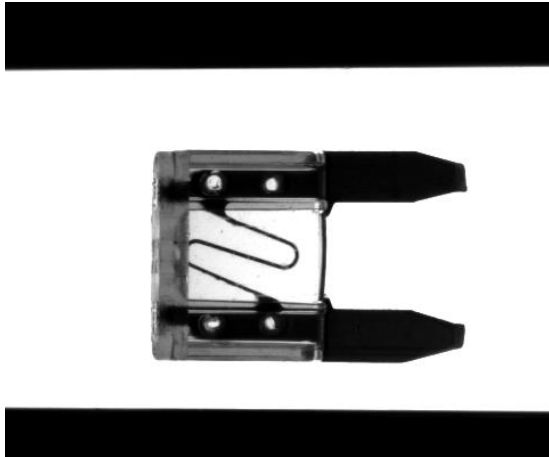

Good Fuse

Bad Fuse

Libraries used:

1. OpenCV
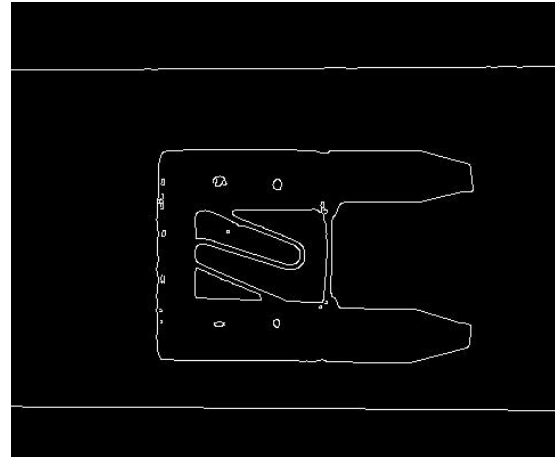2. PIL
3. NumPy
4. TKinter
5. Imutils
6. Os

Logic:

1. Find contour of the object:
   To detect the contour, we first need to apply thresholding which converts image as shown below using thresholding (cv2.threshold) & canny edge (cv2.canny) techniques.
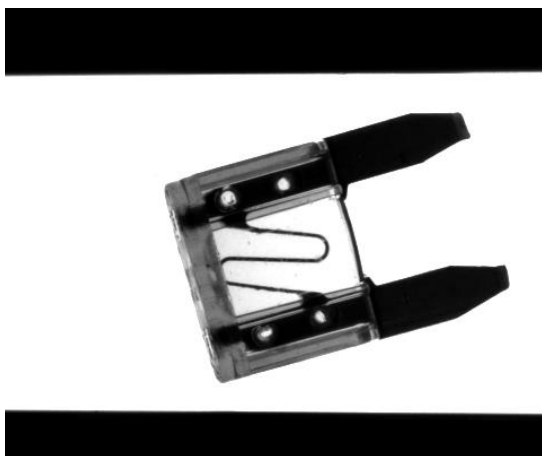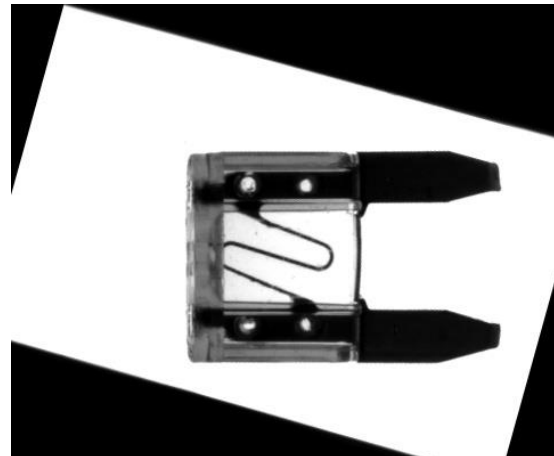

| Before | After |

2. Find Angle and Rotate the image:
   Template matching only works if the template orientation matches in the image as well, that means if the image comes rotated then template matching fails to avoid that we first find the angle of the contour and then rotate the image so that fuse becomes straight as shown below:
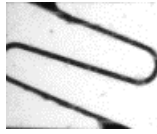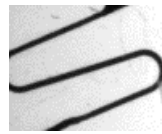

| Before | After |

3. Template Matching:
   Finally, we try matching 2 templates using a threshold value of 0.7 and if found match then we overlay text ok and broken based on results as shown below:

Template1   Template2