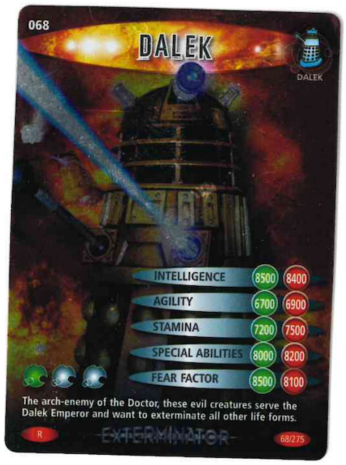
Image Recognition and Tracking Task

This year's coursework is to use what you have learned on the module to automatically help identify picture cards of a game called Battles in Time, from the popular BBC Doctor Who series.

I have scanned some of the cards in groups on a flat-bed scanner and I then used my smartphone camera to take pictures and two short videos of a selection of cards on a table. All of these data files are in the cw_data.zip directory which can be downloaded from the module resources page.

Here's an example of one of card images of one of my favourite baddies, a Dalek. Note that all the images have a three digit number in the top-left hand corner (Dalek is 068). The cards in file train-001.jpg are well worn and are missing their ID numbers!



The Tasks:

1. Separate out the card images from the train-XXX.jpg groups of images. Other than for those in train-001.jpg, in your code you will want to associate each card with its ID number (you'll have to do this manually, but it should not take too long).
2. Using image features, such as colour, histogram-of-gradients (e.g. SIFT/SURF), and/or texture or Gabor features, write a feature based matcher to compare pairs of card images and determine if they are similar. Using your image matcher, on all the 'unidentified' cards in train-001.jpg to find the closest M matches, e.g. M = 5, from all the other cards in the training images.
3. Devise a method to locate and identify cards in selected frames from video-001 and video-002. You may want to use one of the matchers you have developed in steps 2 or 3. Validate and demonstrate the performance of your method.