

## COC202 Computer Vision

### Lab 5 – Video processing – Solutions

1.

```
% colour-based video shot detection
vidObj = VideoReader('lasvegas.mpg'); % read in video

t = 0.5; % similary threshold, 0.5 might not be the best value

figure
k = 0; % counter for cuts
i = 1; % counter for frames

currFrame = readFrame(vidObj);
subplot(5, 5, 6);
imshow(currFrame); % display first frame (=first frame of first shot)
ch1 = colourhist(currFrame); % colour histogram of 1st frame
while hasFrame(vidObj)
    currFrame = readFrame(vidObj);
    subplot(5, 5, 1);
    imshow(currFrame); % display current frame (to "play" video)
    ch2 = colourhist(currFrame); % colour histogram of next frame
    sim(i) = histint(ch1, ch2);
    if sim(i) < t % cut
        k = k + 1;
        [k i+1] % print cut + frame
        subplot(5, 5, k+6);
        imshow(currFrame); % display first frame of shot
    end
    pause(0.01);
    ch1 = ch2; % let's not calculate the same histogram twice
    i = i + 1;
end
figure
plot(sim); % histogram intersection graph so we can see the spikes=cuts
```

2.

```
% frame differencing
vidObj = VideoReader('basketball.mp4');

figure
prevFrame = readFrame(vidObj);
while hasFrame(vidObj)
    currFrame = readFrame(vidObj);
    diff = imabsdiff(rgb2gray(prevFrame), rgb2gray(currFrame)); % frame
    difference
    diff = diff > 50; % threshold
    diff = bwareaopen(diff, 5); % remove small artefacts
    subplot(1,2,1);
    imshow(currFrame);
    subplot(1,2,2);
    imshow(diff);
    pause(0.01);
    prevFrame = currFrame;
end
```