Assignment 3 Report

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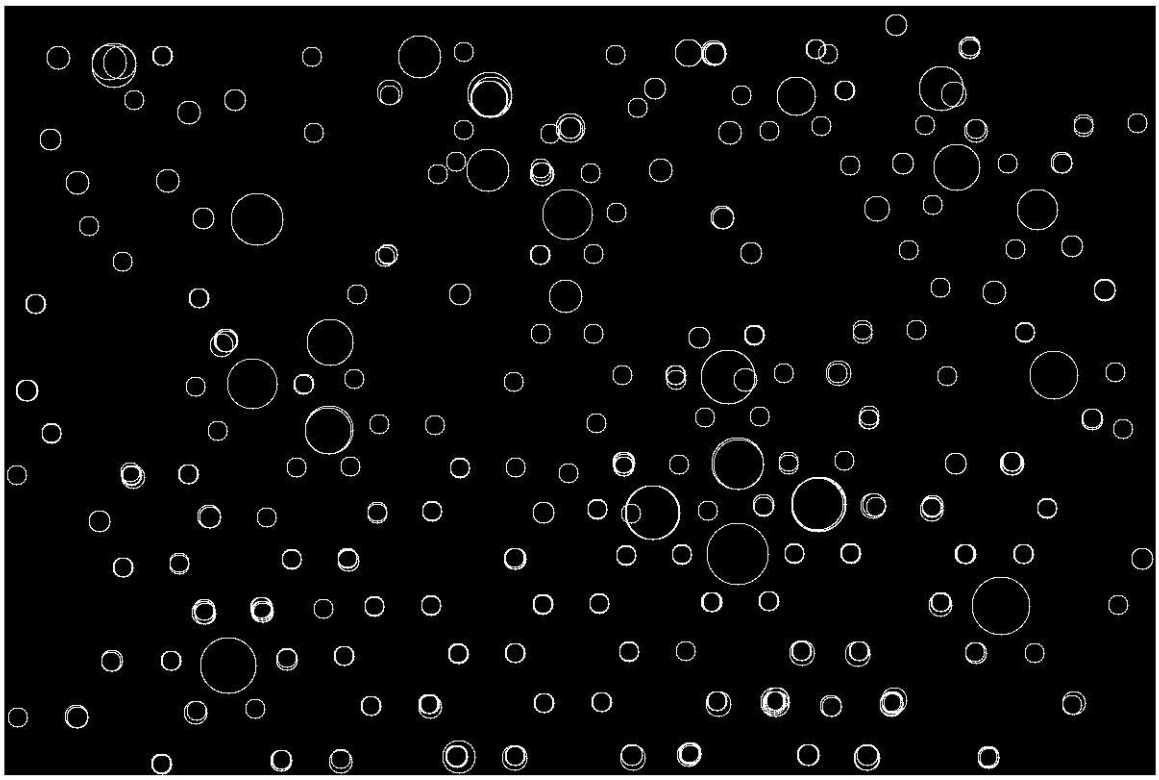
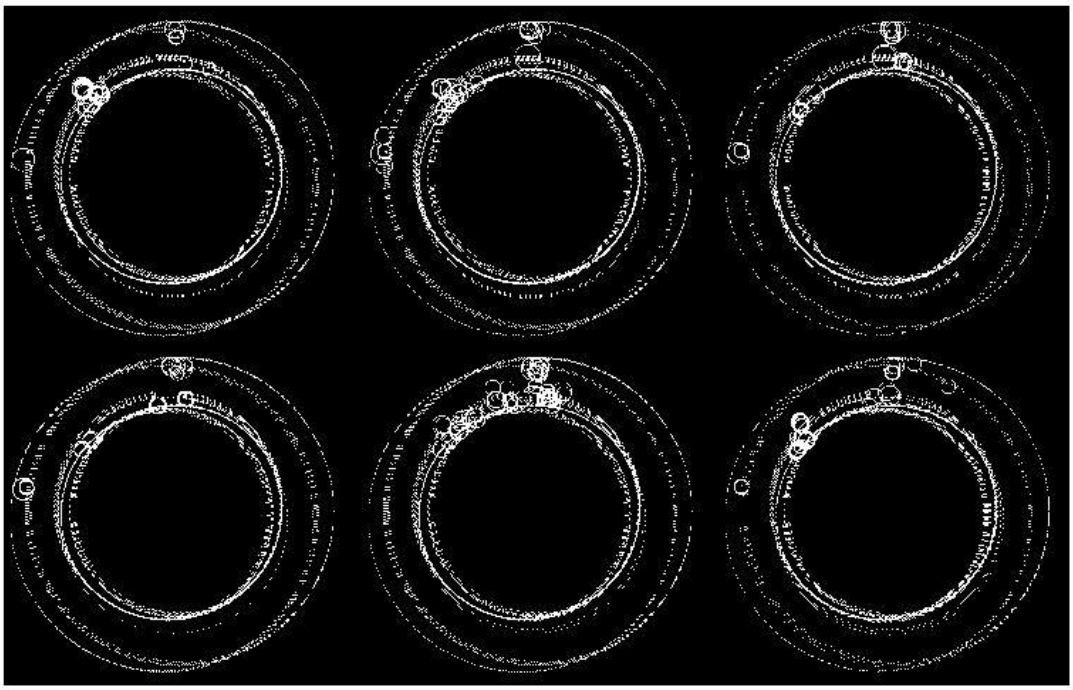
1)
Circles

```
function ans = circles(im)
voteThreshold=180;

im=rgb2gray(im);
im=edge(im,'canny');
im=255*double(im);


[M N]=size(im);
voteArray=zeros(M,N,100);
final=zeros(M,N);

for i=1:M
   for j=1:N
      if(im(i,j)==255)
         for r=10:100
            for theta=0:360
               a= i-r*cos(theta*pi/180);
               b=j-r*sin(theta*pi/180);
               a = floor(a);
               b = floor(b);
               if(a>=1 && b>=1)
                 if(a<=M && b<=N)
                   voteArray(a,b,r)=voteArray(a,b,r)+1;
                 end
               end
            end
         end
      end
   end
end

k=1;
for i=1:M
   for j=10:N
      for r=1:100
         if( voteThreshold < voteArray(i,j,r))
            store(k,1)=i;
            store(k,2)=j;
            store(k,3)=r;
            for theta=0:360
               a=i-r*cos(theta*pi/180);
               b=j-r*sin(theta*pi/180);
               a = floor(a);
               b = floor(b);
               if(a>=1 && b>=1)
                 if(a<=M && b<=N)
                   final(a,b)=255;
                 end
               end
            end
```

```
            k=k+1;
          end
        end
    end
end
imshow(uint8(final));
ans = uint8(final);
end
```

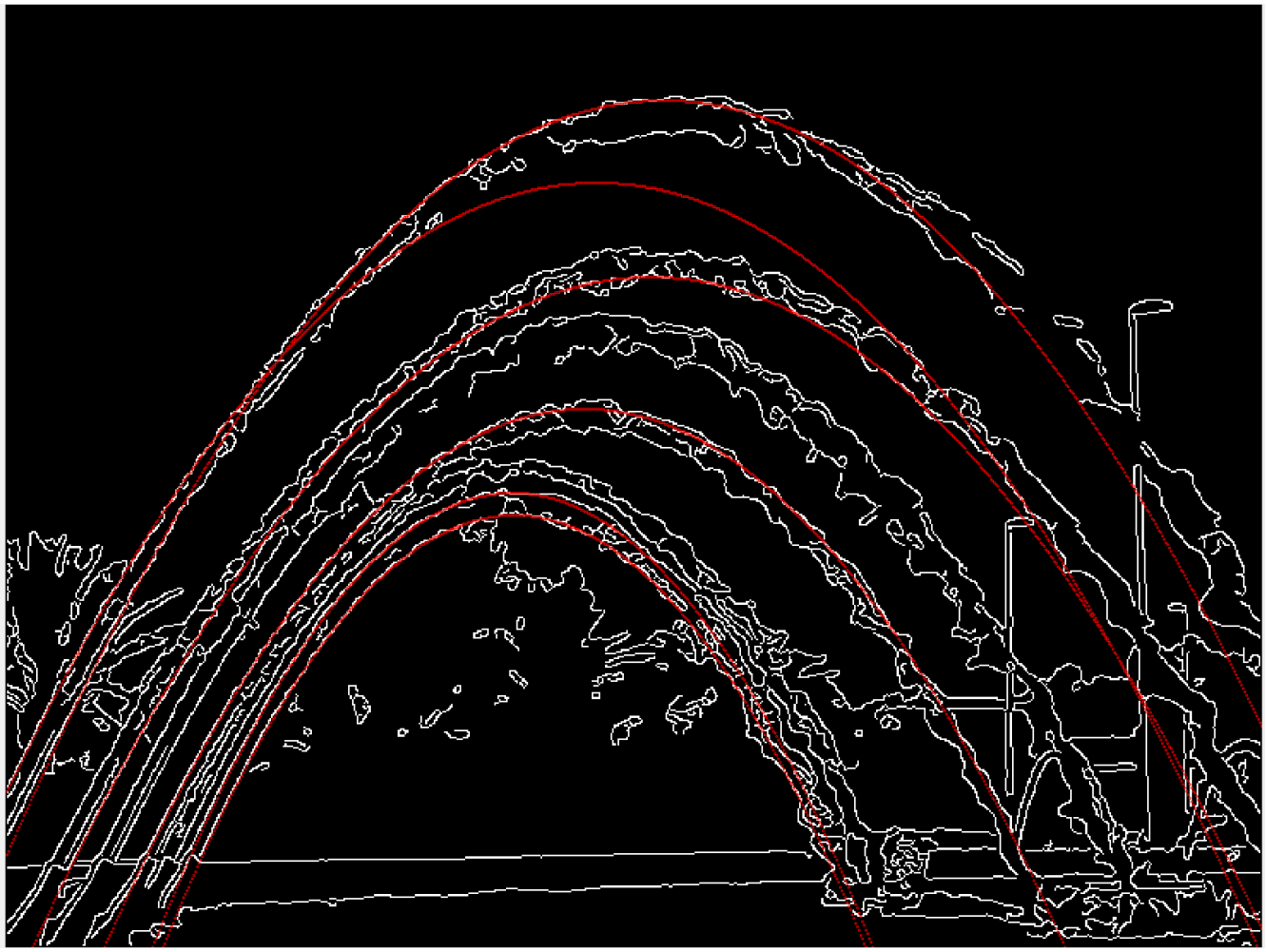


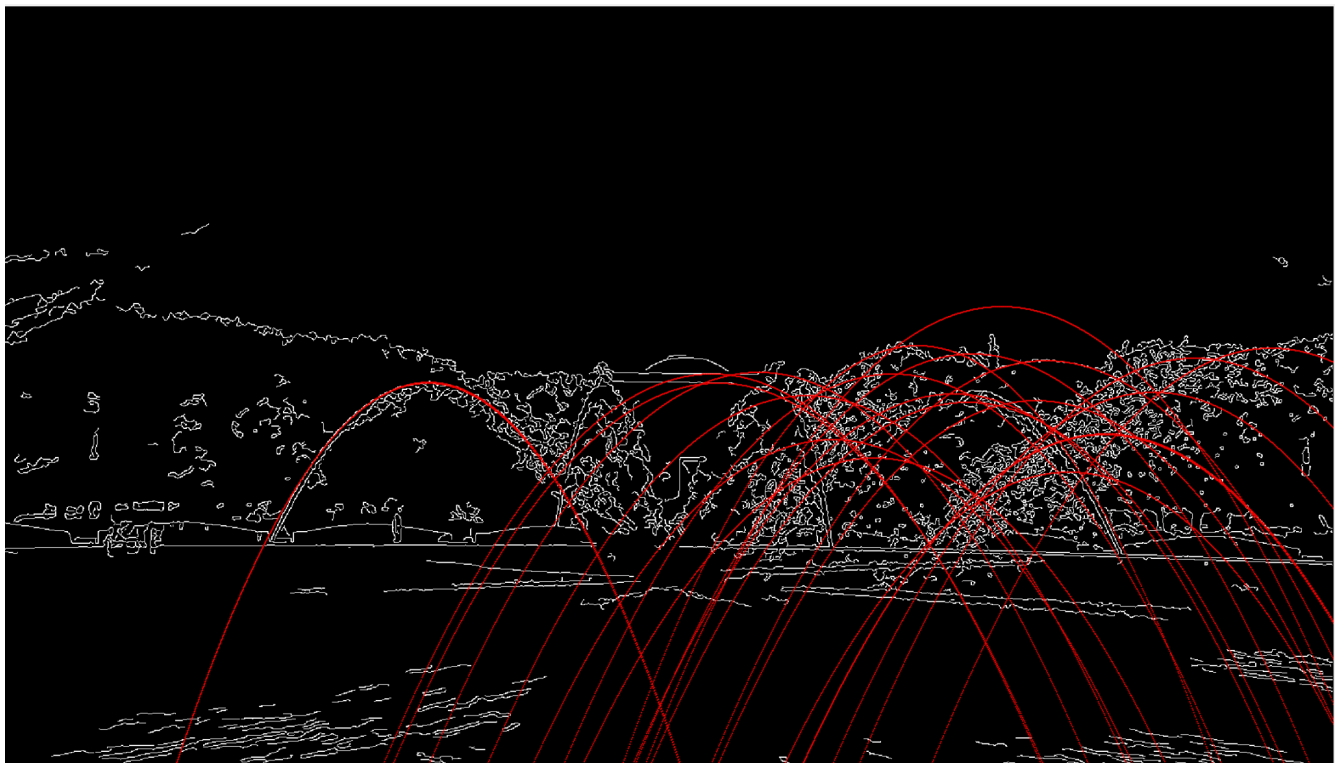


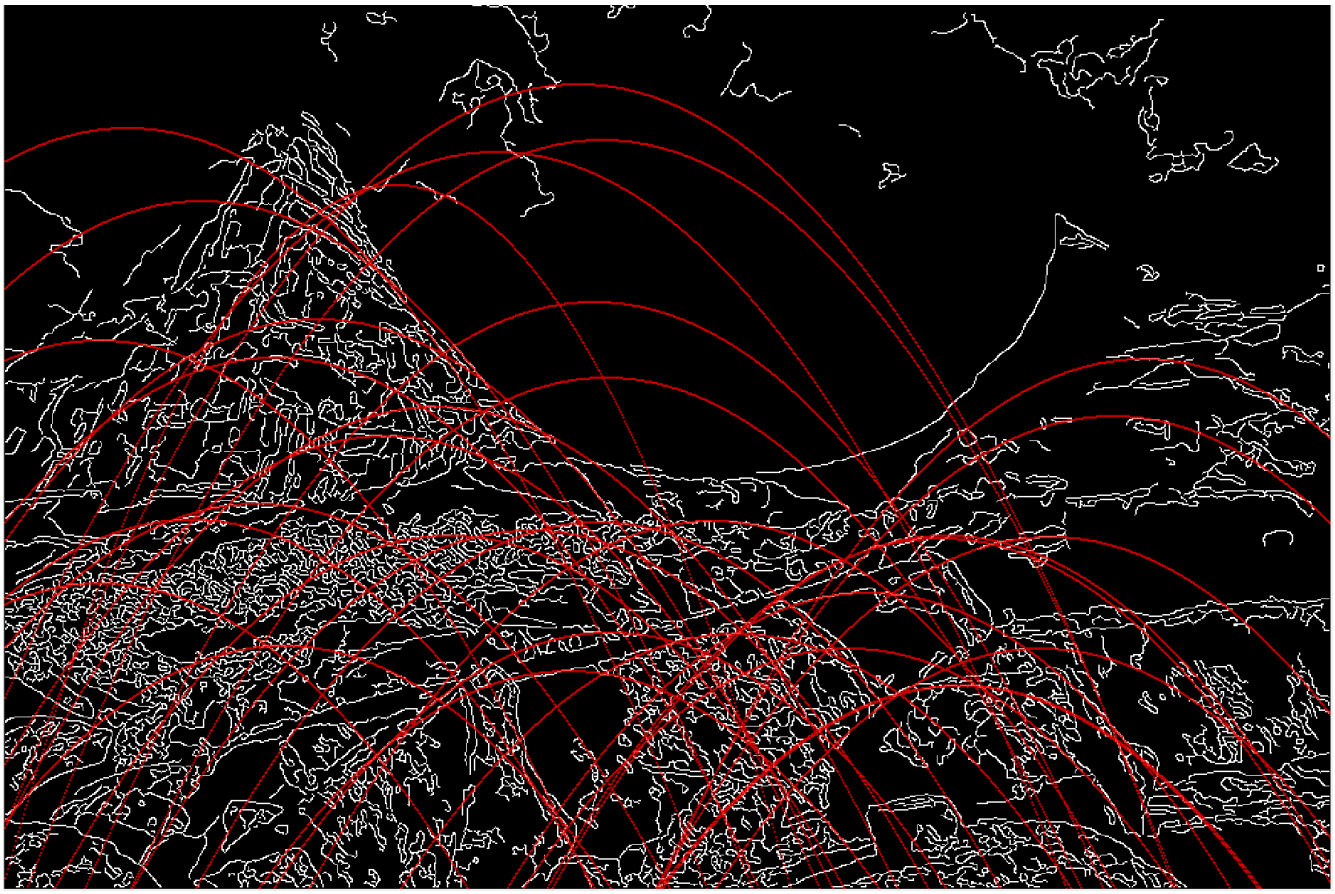
Parabola

```
function ans = detectparabola(img)

rvals = [0.003,0.004,0.005,0.006,0.007,0.008];

I=rgb2gray(img);


[N,M]=size(I);

A=zeros(N,M,R);

[E,thresh]=edge(I,'canny',0.25);
[yindex xindex]=find(E);

y0detect = [];
x0detect= [];

thresh = 100;

r0detect= [];

R=length(rvals);
for cnt=1:length(xindex)
   for r=1:R
      for x0=1:M
         del = rvals(r)*(xindex(cnt)-x0)^2;
         y0=round(yindex(cnt)-del);
```

```
            if( (y0 < N) && (y0>=1))
                A(y0,x0,r) = A(y0,x0,r)+1;
            end
        end
    end
end

Amax=imdilate(max(A,[],3),strel('disk',40));


for r=1:R
    [y0 x0]=find((Amax(:,:) == A(:,:,r)) & ...
      A(:,:,r) > thresh);
    temp = ones(length(x0,1));
    r0detect=[r0detect; rvals(r)*temp];

    y0detect=[y0detect; y0];
    x0detect=[x0detect; x0];
end

subplot(1,2,1);
imshow(I,[]);

subplot(1,2,2);
imshow(E,[]);

for i=1:length(x0detect)
    x0=x0detect(i);
    y0=y0detect(i);
    r0=r0detect(i);
    for x=1:M
        delX = (x-x0);
        y=y0+r0*delX^2;
        y=round(y);
        if y<=N & y>=1
            rectangle('Position',[x y 1 1],'Edgecolor','r');
        end
    end
end

ans = E;

end
```

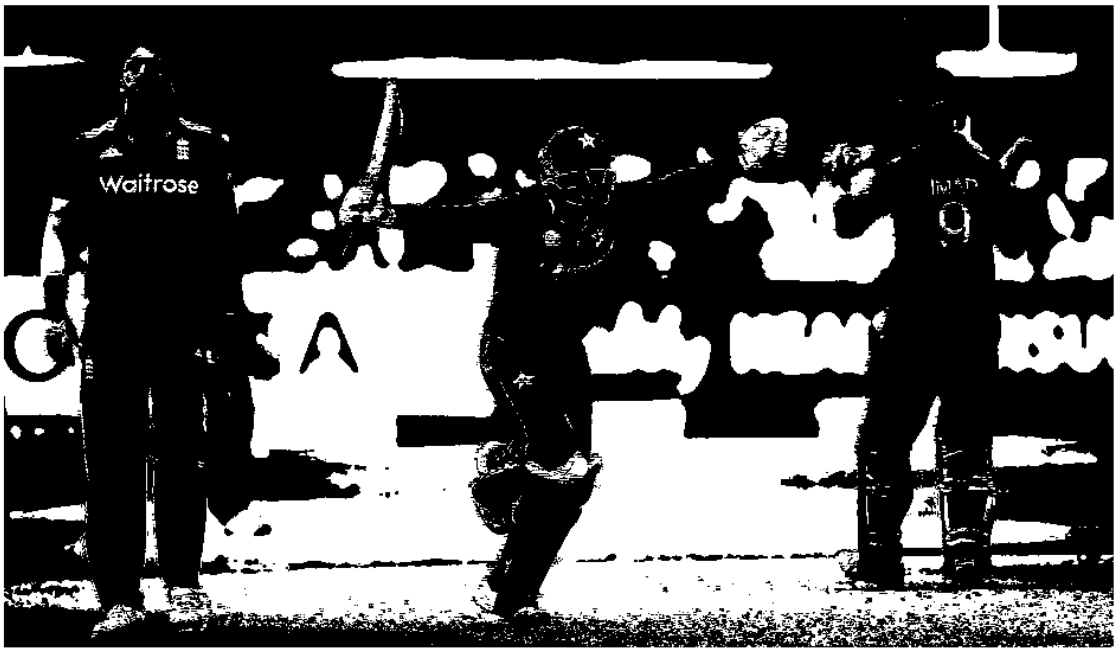






2)

```
function ans = q2(img)

img = double(rgb2gray(img));

[h,w] = size(img);
h = h-3;
w = w-3;
varCoef = 0.0085;
meanCoef = 1.265;
meanGlob = mean(mean(img(:,:)));

for i=1:h
   for j=1:w
         imTemp=img(i:i+2,j:j+2);
         varTemp=var(var(imTemp(:,:)));
         Txy(j) = varCoef*varTemp+ meanCoef*meanGlob;
         if(Txy(j)>255)
           if(j~=1)
             Txy(j)=Txy(j-1);
           end
         end

         if (img(i,j)<=Txy(j))
            out(i,j) = 0;
         else
            out(i,j) = 1;
         end
      end
end

imshow(out);

end
```


Waitrose


SINGE