# MAIN

%% load image

white\_tower = imread('white-tower.png');

white\_tower = double(white\_tower);

%% kmean initial

k\_num = 10;

wt\_matrix = reshape(white\_tower(:), [],3);

[kt,p] = kmean(k\_num, wt\_matrix,10);

%% kmean

q = zeros(length(p),3);

for i = 1:length(p)

t = p(i);

q(i,:) = kt(t,:);

end

white\_kmean = reshape(q,[720,1280,3]);

imshow(uint8(white\_kmen));

pause;

%% SLIC initial

wt\_slic = imread('wt\_slic.png');

wt\_slic = double(wt\_slic);

wt\_grad\_mag = grad\_mag(wt\_slic);

centroid = [];

for i = 1:50:500

for j = 1:50:750

centroid = [centroid;i,j];

end

end

%%

max\_iter = 3;

iter = 1;

while iter <= max\_iter

slic = zeros(500,750,3);

cent = [];

for i = 1: length(centroid)

Rc = wt\_slic(centroid(i,1),centroid(i,2),1);

Gc = wt\_slic(centroid(i,1),centroid(i,2),2);

Bc = wt\_slic(centroid(i,1),centroid(i,2),3);

cent = [cent;centroid(i,1),centroid(i,2),Rc,Gc,Bc];

end

for j = 1:length(cent)

rangey = max(1,cent(j,1)-49):min(500,cent(j,1)+50);

rangex = max(1,cent(j,2)-49):min(750,cent(j,2)+50);

cplist = cent(knnsearch(centroid, centroid(j,:),'K',5),:);

pi\_mag = [];

for x = rangex

for y = rangey

Rp = wt\_slic(y,x,1);

Gp = wt\_slic(y,x,2);

Bp = wt\_slic(y,x,3);

pi\_mag = [pi\_mag;y,x,Rp,Gp,Bp];

end

end

index = dsearchn(cplist, pi\_mag);

u = find(ismember(cplist,cent(j,:),'rows'));

cent(j,:) = round(mean(pi\_mag(index == u,:)));

xy = pi\_mag(index==u,1:2);

for e = 1:length(xy)

slic(xy(e,1),xy(e,2),1) = cent(j,3);

slic(xy(e,1),xy(e,2),2) = cent(j,4);

slic(xy(e,1),xy(e,2),3) = cent(j,5);

end

end

iter = iter +1;

end

imshow(uint8(slic));

# KMEAN

function [kt,p] = kmean(k, X\_matrix, threshold)

s = RandStream('mlfg6331\_64');

kt = datasample(s,X\_matrix,k,'Replace',false);

k0 = zeros(size(kt));

dist = det((kt-k0)'\*(kt-k0));

while dist > threshold

k0 = kt;

p = dsearchn(kt, X\_matrix);

for i = 1:k

q = X\_matrix.\*(p==i);

q = q(any(q,2),:);

kt(i,:) = mean(q);

end

dist = det((kt-k0)'\*(kt-k0));

end

p = dsearchn(kt, X\_matrix);

end

# grad\_mag

function grad\_mag = grad\_mag(X)

[Rmag,Rdir] = imgradient(X(:,:,1));

[Gmag,Gdir] = imgradient(X(:,:,2));

[Bmag,Bdir] = imgradient(X(:,:,3));

grad\_mag = sqrt(Rmag.^2 + Gmag.^2 + Bmag.^2);

end

**Result**



