西安交通大学

**计算机视觉与**

**模式识别**

计算机53班

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1. 实现genPyramids1中的expand和reduce函数，他们两个的输入都是图像+一个可分离的滤波器w，利用上课讲的expand和reduce实现这两个函数。

源代码

function after\_expand = expand(origin,w)

[row,col,path] = size(origin);

expand\_temp = zeros(row \* 2,col,path);

for row\_con = 1 : row

for col\_con = 1 : col

for path\_con = 1 : path

expand\_temp(row\_con \* 2,col\_con,path\_con) = origin(row\_con,col\_con,path\_con);

end

end

end

padding = zeros(1,col,path);

expand\_temp\_with\_padding = [padding;padding;expand\_temp;padding;padding];

for col\_con = 1 : col

for row\_con = 1 : row \* 2

for path\_con = 1:path

expand\_temp(row\_con,col\_con,path\_con) = 2 \* sum(expand\_temp\_with\_padding(row\_con + 2 - 2:row\_con + 2 + 2,col\_con,path\_con) .\* w');

end

end

end

after\_expand = zeros(row \* 2,col \* 2,path);

for row\_con = 1:row \* 2

for col\_con = 1:col

for path\_con = 1:path

after\_expand(row\_con,col\_con \* 2,path\_con) = expand\_temp(row\_con,col\_con,path\_con);

end

end

end

padding = zeros(row \* 2,1,path);

after\_expand\_with\_padding = [padding padding after\_expand padding padding];

for row\_con = 1:row \* 2

for col\_con = 1:col \* 2

for path\_con = 1:path

after\_expand(row\_con,col\_con,path\_con) = 2 \* sum(after\_expand\_with\_padding(row\_con,col\_con + 2 - 2:col\_con + 2 + 2,path\_con) .\* w);

end

end

end

end

function after\_reduce = reduce(origin,w)

[row,col,path] = size(origin);

padding = zeros(row,1,path);

origin = [padding padding origin padding padding];

reduce\_temp = zeros(row,floor(col / 2),path);

for row\_con = 1:row

for col\_con = 2:2:col

for path\_con = 1:path

reduce\_temp(row\_con,floor(col\_con / 2),path\_con) = sum(origin(row\_con,col\_con + 2 - 2:col\_con + 2 + 2,path\_con) .\* w);

end

end

end

[row,col,path] = size(reduce\_temp);

after\_reduce = zeros(floor(row / 2),col,path);

w = w';

padding = zeros(1,col,path);

reduce\_temp = [padding;padding;reduce\_temp;padding;padding];

for col\_con = 1:col

for row\_con = 2:2:row

for path\_con = 1:path

after\_reduce(floor(row\_con / 2),col\_con,path\_con) = sum(reduce\_temp(row\_con + 2 - 2:row\_con + 2 + 2,col\_con,path\_con) .\* w);

end

end

end

end

实验结果

高斯金字塔



拉普拉斯金字塔



1. 利用拉普拉斯金字塔进行图像合成（补充recoverLaplacian函数）

源代码

function imBlend = recoverLaplacian(lapsBlend)

w = [1/8 1/4 1/4 1/4 1/8];

[row,~] = size(lapsBlend);

for laps\_con = row:-1:2

after\_expand = expand(lapsBlend{laps\_con,1},w);

after\_expand\_size = size(after\_expand);

laps\_Blend\_size = size(lapsBlend{laps\_con - 1,1});

if(after\_expand\_size(1) < laps\_Blend\_size(1))

after\_expand = vertcat(after\_expand,after\_expand(end,:,:));

end

if(after\_expand\_size(2) < laps\_Blend\_size(2))

after\_expand = horzcat(after\_expand,after\_expand(:,end,:));

end

lapsBlend{laps\_con - 1,1} = lapsBlend{laps\_con - 1,1} + after\_expand;

end

imBlend = lapsBlend{1,1};

end

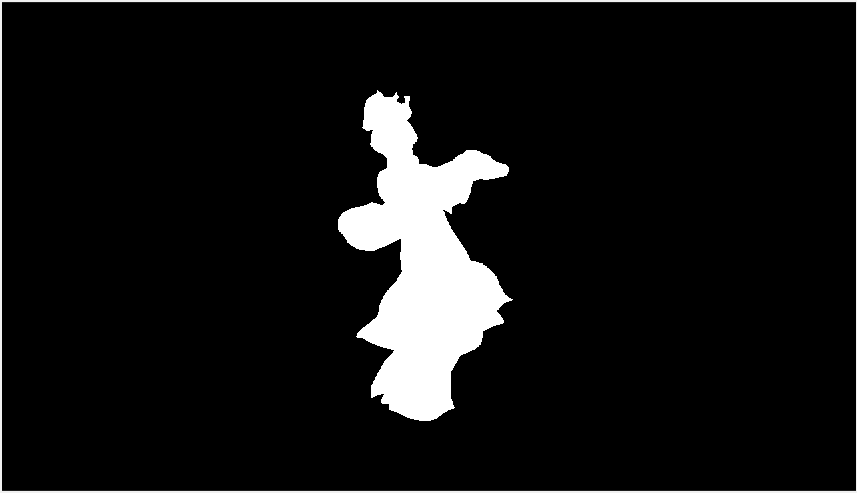
实验结果

使用genMask.m生成Mask



使用demo\_laplacian\_blend.m进行图像的合成

生成的Mask



背景图片



Blend后结果

