Homework
Stereo Matching

1. Please modify the matlab code, **two_pass_test.m**. Change the left depth matching to the right.

2. The example shows the left depth.

3. If you modify below code to enhance image quality, you will get bonus score

- Initial cost (census)

```matlab
for y = 2: 1: height-1
    for x = 2: 1: width-1
        for i = 1: 1: 3
            for xi = -1: 1: 1
                for yi = -1: 1: 1
                    if(im2(y+yi,x+xi,i) > im2(y,x,i) && im2(y+yi,x+xi,i) < im2(y,x,i)+threash)
                        census_L(y,x,i+a*3) = 110;
                    elseif(im2(y+yi,x+xi,i) <= im2(y,x,i)-threash)
                        census_L(y,x,i+a*3) = 0;
                    elseif(im2(y+yi,x+xi,i) > im2(y,x,i)-threash && im2(y+yi,x+xi,i) <= im2(y,x,i))
                        census_L(y,x,i+a*3) = 100;
                    elseif(im2(y+yi,x+xi,i) >= im2(y,x,i)+threash)
                        census_L(y,x,i+a*3) = 111;
                    end

                    if(a<=7)
                        a=a+1;
                    else
                        a=0;
                    end

                end
            end
        end
    end
end
```

- vertical aggregation+horizontal aggregation

```matlab
v_agg_cost_U = zeros(height,width,d_size);

for y = 1: 1: height
    for x = 1: 1: width
        for d = d_min :jump_disparity:d_size
            if( y>1 && y <=height  )
                v_agg_cost_U( y,x,d ) = ( initial_cost(y,x,d) + weight_v (y-1,x)*v_agg_cost_U( y-1,x,d ));
            else
                v_agg_cost_U( y,x,d ) = initial_cost(y,x,d);
            end
        end
    end
end

v_agg_cost_D = zeros(height,width,d_size);

for d = d_min :jump_disparity:d_size
    for y = height: -1: 1
        for x = 1: 1: width
            if(y>=1 && y <height-1)
                v_agg_cost_D( y,x,d ) = initial_cost(y,x,d) + weight_v (y+1,x)*v_agg_cost_D( y+1,x,d );
            else
                v_agg_cost_D( y,x,d ) = initial_cost(y,x,d);
            end
        end
    end
```

4. hint:

- you can change the hole stereo matching algorithm to attend the better results, but I recommend enhancing the aggregation part. It will increase the depth dramatically.

- Super hint: if you just want to pass this homework. All you need to do is change one parameter.

  (if you understand the code)