
Algorithm 1 Calculate Gradient

Input: v : 网格顶点信息; m : 测量的尺寸信息; im : 输入的尺寸信息; pId : 每个尺寸对应的顶点信息

Output: G : 梯度

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1: for  $i = 0; i < pId.size(); ++i$  do
2:   for  $j = 0; j < pId[i].size() - 1; ++j$  do
3:      $p_1Id = pId[i][j]; p_2Id = pId[i][j + 1]$ 
4:      $p_1 = v(p_1Id); p_2 = v(p_2Id);$ 
5:      $l = |p_1 - p_2|;$ 
6:      $l_t = \frac{im(i)}{m(i)}l;$ 
7:      $g = 4 * (l^2 - l_t^2)^2 * (p_1 - p_2);$ 
8:      $G(p_1Id) = g; G(p_2Id) = -g;$ 
9:   end for
10: end for
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