Shanti Stewart

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Modified Canny Edge Detection Algorithm

Notations:

1. Step 1: Gaussian Blur Filter:
   1. Inputs:
      1. Symmetric 2D Gaussian kernel matrix:
         1. Sample symmetric 2D Gaussian distribution:
      2. Normalize kernel (so that its elements sum to 1):
      3. Zero-padded raw image:
         1. Zero-pad raw image for 2D “same” convolution:
   2. Computation:
      1. Compute 2D “same” convolution:
   3. Outputs:
      1. Blurred image:
2. Gradient Estimation:
   1. Inputs:
      1. Sobel operator kernels:
         1. Horizontal Sobel operator (for horizontal gradients):
         2. Vertical Sobel operator (for vertical gradients):
      2. Blurred image:
   2. Computation:
      1. Convolve with horizontal and vertical Sobel operators (post zero-padded):
      2. Compute L1-norm of horizontal and vertical gradients:
      3. Take maximum gradient over color channels:
   3. Outputs:
      1. Gradient image:
3. Horizontal Non-Maximal Suppression:
4. Long Vertical Edge Determination: