Introduction to Computer Vision
Active Contours

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Lab 5 Report

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1 Introduction

This lab deals with implementing Active Contours to segment objects in an Image. This implementation uses two distance based internal energy terms and a sobel based gradient term for external energy.

2 Implementation

The implementation of the Active Contours has 3 broad stages - creating a sobel image for external energy, implementing a distance metric for Internal energy term 1, and another distance metric that includes average contour separation as internal energy term 2.

2.1 Sobel Filter

The Sobel filter is implemented in two phases (x-direction and y-direction) and these values are squared and added to generate a Gradient matrix. This is then normalized for output, and subsequently used as the external energy metric.

Figure 1: Sobel Filter Output

2.2 Active Contours

The initial placement of the contour points are shown in 2. The final position of the contour points after 30 iterations is shown in 3.

Figure 2: Initial Contour Points

Figure 3: Final Contour Points

3 Results

The x and y positions of the final contours is given in table

Table 1: Final Contour Locations

X	Y
246	84
261	92
263	96
265	103
278	112
286	125
286	125
277	144
277	157
273	170
273	170
266	188
258	207
265	226
253	227
240	234
240	234
222	252
221	257
212	266
212	266
194	260
184	261
187	253
181	243
166	237
169	220
169	220
180	201
181	195
174	182
177	172
184	165
188	145
182	130
196	122
202	112
208	97
225	90
225	90
246	84
231	65