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Specific Object Recognition Using Iso-Luminal Contours

A thesis presented in fulfilment of the requirements for the degree of

Master in Engineering

in

Mechatronics

at Massey University,

Palmerston North, New Zealand.

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2013

1.1. Abstract

" Specific Object Recognition Using Iso-Luminal Contours "

Object recognition is a broad topic in the study of computer vision. In this case the task of distinguishing between specific instances of various objects is addressed. The ability to perform this task would allow robots to operate in unstructured environments, allowing greater and more efficient automation of many tasks. Techniques currently proposed tend to have low accuracy rates, high processing time, or both. This research seeks to establish a method that can quickly and accurately find instances of objects within a scene.

Iso-luminal contours were used to gather the initial data, from which higher level features were extracted. Basic geometric features were used as the intermediate data, consisting of lines, arcs, and lobes (a custom type suited to describe corners). The high level data was a custom type, called blocks; each block contains a few features and describes the spatial relationships between them. The features and blocks are designed to be spatially invariant, so the blocks are directly compared to determine which objects are in a scene.

The objectives of this research were not met. The results show the geometric features were not robust to changes in image sets, although they did work well with the image set they were developed with. Unfortunately this means the performance of the subsequent 'block' related steps cannot be established. Most of the work was focussed on this aspect. Future work would entail increasing the robustness of the features part of the algorithm, and then gauging if the block based research is of practical use.

It is thought that the research results were poor because feature extraction was poor. It is further thought that the high level analysis has merit.

1.2. Acknowledgements

I would like to thank those who made significant contributions to this work:

My supervisors Rory Flemmer and Huub Bakker.

Funding contributions from the Todd Foundation and Sir Alan Stewart Postgraduate scholarships.

1.3. List of Figures

Figure 1. Greyscale image of the mug.....	16
Figure 2. Isolumes on the mug	17
Figure 3. Fingerprint plot for the mug's outline.....	17
Figure 4. Topographic map of an object's corner generated from a greyscale image.....	33
Figure 5. Isolume extraction flowchart	34
Figure 6. Scan Array	37
Figure 7. Pixel operations for isolume extraction.....	40
Figure 8. Contour arc fitting.....	43
Figure 9. Fingerprint generated by the system.....	44
Figure 10. Mug outline.....	44
Figure 11. Fingerprint showing curvature harmonics	45
Figure 12. Fingerprint with curvature harmonics removed.....	46
Figure 13. Fingerprint with divisions shown.....	47
Figure 14. Line feature type	48
Figure 15. Lobe feature type	49
Figure 16. Lobe skewness and kurtosis.....	50
Figure 17. Arc feature type.....	51
Figure 18. Arc parameter calculation	52
Figure 19. Arc combining.....	53
Figure 20. Ellipse feature type.....	54
Figure 21. Ellipse combining	56
Figure 22. Sample from feature test image set.....	58
Figure 23. Additional arc test feature comparison	62
Figure 24. Arc symmetry descriptor calculation	66
Figure 25. Parallel line descriptor calculation.....	67
Figure 26. Line square descriptor calculation	68
Figure 27. Different type of feature pairs.....	74
Figure 28. Line Line, Arc Line, and Arc Arc block examples	75
Figure 29. Line Lobe, Arc Lobe, and Lobe Lobe block examples.....	77
Figure 30. Scale, direction, and position data for pair blocks	79
Figure 31. Four main triple types	81
Figure 32. Triple scale, rotation and position assignment.....	86
Figure 33. Derived block external data calculation.....	88

Figure 34. Block comparison flowchart.....	92
Figure 35. Two dimensional QT clustering example.....	95
Figure 36. Spatial matching flowchart.....	97
Figure 37. Custom 100 pictures dataset.....	104
Figure 38. Derived blocks creation process.....	110
Figure 39. Next level derived blocks creation process.....	111
Figure 40. True positive rates for bit descriptor method.....	118
Figure 41. False positive rates for bit-descriptor method.....	119
Figure 42. True positive rates for all-features block method.....	119
Figure 43. False positive rates for all-features block method.....	120
Figure 44. True positive rates for single-contour blocks method.....	120
Figure 45. False positive rates for single-contour blocks method.....	121
Figure 46. Bit-Descriptor weight histogram.....	122
Figure 47. Example discrimination graph.....	124
Figure 48. Discrimination graph for all types of block.....	126
Figure 49. Discrimination graph for all block types left in the system.....	127
Figure 50. Cluster performance curves.....	128
Figure 51. Spatial Match performance curves.....	130
Figure 52. Learning set size, object image count.....	131
Figure 53. Learning set size, no-object image count.....	132

1.4. List of Tables

Table 1. Feature comparison results.....	61
Table 2. Features found, by type	61
Table 3. Additional arc test	62
Table 4. Descriptor name examples	65
Table 5. Parameters for Line Line, Arc Line, and Arc Arc blocks.....	75
Table 6. Parameter for Line Lobe, Arc Lobe, and Lobe Lobe blocks.....	77
Table 7. All Line block parameters	81
Table 8. Two Line block parameters.....	82
Table 9. Two Point Block Parameters.....	83
Table 10. All Points Block Parameters.....	84
Table 11. Example derived block value calculation.....	89
Table 12. Circle-circle-circle block database table columns	91
Table 13. Arc-lobe example error values	92
Table 14. Block type effectiveness comparison (rating >0.1).....	125
Table 15. Block type effectiveness comparison (rating > 0.05).....	125
Table 16. Learning set selection methods	133
Table 17. Combined learning results.....	133
Table 18. Second Set Full Learning Set Performance.....	134
Table 19. Second Set Subset Learning Performance.....	135
Table 20. Caltech-101 Sample Object Class Performance.....	135
Table 21. Categorised Error Results.....	136
Table 22. Match Rates of Assembled Blocks using Insignificant Features	136
Table 23. Parameter Error Proportions.....	137

1.5. Table of Contents

1.1.	Abstract	i
1.2.	Acknowledgements	iii
1.3.	List of Figures	v
1.4.	List of Tables	vii
1.5.	Table of Contents	ix
2.	Introduction.....	1
3.	Literature Review	5
3.1.	Research History	6
3.2.	Overview of the Current State of the Art	7
3.3.	Analysis of the Human Vision System	8
3.3.1.	Image Acquisition.....	8
3.3.2.	Information Propagation.....	8
3.4.	Object Recognition Systems Overview	10
3.4.1.	Scale Invariant Feature Transforms.....	10
3.4.2.	Content-based Image Retrieval.....	10
3.4.3.	Context-Based Object-Class Recognition and Retrieval by Generalised Correlograms	11
3.4.4.	Weakly Supervised and Unsupervised Category Learning	12
3.5.	Edge detection.....	13
3.5.1.	General Edge Detectors	13
3.5.1.	Level Sets	14
3.5.2.	Phase Congruency	15
3.5.3.	Iso-luminal Contours	15
3.6.	Object Curve Comparison Techniques	19
3.6.1.	Simple Contour Description Methods	19
3.6.2.	Contour Distance Transform	20
3.6.3.	Contour Segment Networks.....	20
3.6.4.	Cross-Correlation.....	21
3.6.5.	Curvature Scale Space	22
3.7.	Extracted Features.....	23
3.7.1.	Object Contours Using Arc Length and Tangent Orientation	23
3.7.2.	Hough Transform.....	24
3.7.3.	Best Fit Geometric Features	24

3.8.	Feature Comparison Algorithms	26
3.8.1.	Object Classes/Clusters	26
3.8.2.	Maximum Entropy Framework	27
3.8.3.	Semi-Local Affine Parts	28
3.9.	Conclusions on the Literature Survey	29
4.	Recognition Method	31
4.1.	Isolines	32
4.1.1.	Extraction	33
4.1.1.1.	Specific Implementation	33
4.1.2.	Comparison with Flemmer and Bakker's Algorithm	41
4.2.	Features	42
4.2.1.	Fingerprint Calculation	42
4.2.2.	Lines	47
4.2.3.	Lobes	49
4.2.4.	Arcs	51
4.2.5.	Ellipses	54
4.3.	Feature Extraction Test	57
4.4.	Feature Extraction Results	60
4.5.	Feature Extraction Conclusions	63
4.6.	Comparison Techniques	63
4.6.1.	Bit Descriptors	64
4.6.1.1.	Descriptors	65
4.6.1.2.	Comparison	70
4.6.2.	Pair and Triple Blocks	71
4.6.2.1.	Block Types	73
4.6.2.2.	Pair Blocks	73
4.6.2.3.	Triple Blocks	80
4.6.2.4.	Derived Blocks	87
4.6.2.5.	Block Comparison	89
4.6.2.6.	Learning Algorithm	90
4.6.2.7.	Block Comparison Pass	91
4.6.2.8.	Clustering	93
4.6.2.9.	Spatial Matching	97
5.	Results	101
5.1.	Test Method	102

5.1.1.	Bit Descriptors vs Blocks	102
5.1.2.	Bit Descriptor Flaws	105
5.1.3.	Pairs and Triples Type Evaluation.....	105
5.1.4.	Clustering.....	107
5.1.5.	Spatial Matching.....	109
5.1.6.	Supervised Learning to Establish a Subset Size	112
5.1.7.	Alternate Image Sets.....	114
5.1.8.	System Flaws for Alternate Image Sets.....	115
5.2.	Results and Discussion.....	117
5.2.1.	Bit Descriptor vs Blocks.....	118
5.2.1.1.	Bit Descriptor Performance	118
5.2.1.2.	Blocks from All-Features Performance	119
5.2.1.3.	Blocks from a Single-Contour Performance	120
5.2.1.4.	Comparison Between Methods	121
5.2.2.	Bit Descriptor Flaws	122
5.2.3.	Pairs and Triples Type Evaluation.....	123
5.2.4.	Clustering.....	128
5.2.5.	Spatial Matching.....	129
5.2.6.	Supervised Learning to Establish a Subset Size	131
5.2.7.	Alternate Image Sets.....	134
5.2.8.	System Flaws for Alternate Image Sets.....	136
6.	Conclusions.....	139
6.1.	Bit Descriptor vs Blocks	139
6.2.	Bit Descriptor Flaws	140
6.3.	Pair and Triples Type Evaluation.....	141
6.4.	Clustering.....	142
6.5.	Spatial Matching	143
6.6.	Learning Ability.....	144
6.7.	Alternate Image Sets	145
6.8.	System Flaws for Alternate Image Sets	146
6.9.	Overall Conclusion	147
7.	Recommendations.....	149
8.	Appendix A – Bit Descriptor List.....	151
9.	References.....	153

