

AVC88

PROCEEDINGS

of the

FOURTH

ALVEY VISION CONFERENCE

**University of Manchester
31st August – 2nd September
1988**

AVC88

**SPONSORED BY THE INFORMATION
ENGINEERING DIRECTORATE**

Organising Committee

C J Taylor - Conference Chairman
K M Crennell - Conference Secretary
W G L Adaway
M B Brown
B F Buxton
D Hogg
R N Kay
A C Sleigh
G Sullivan

Proceedings Secretary

M M Matthews

The papers in this volume are published, without modification, as a record of the proceedings of the Alvey Vision Conference 1988. As such they represent the authors' opinions and their inclusion in this publication does not necessarily constitute endorsement by the Organising Committee.

Abstracting is permitted with credit to the source. Isolated articles may be photocopied without fee for the purposes of private study or non-commercial teaching. For other copying, reprint or republication permission please contact the authors directly.

©Copyright 1988 by the Organising Committee AVC 88

Designed and Printed by the University of Sheffield Printing Unit

CONTENTS

SESSION 2

- Model Based Vision using a Planar Representation of the Viewsphere* 1
A.Rydz, G.D.Sullivan and K.D.Baker, University of Reading.
- The Consistent Labelling of Image Features using an ATMS* 7
R.Bodington, G.D.Sullivan and K.D.Baker, University of Reading.
- Model Based Perspective Inversion* 13
A.D.Worrall, K.D.Baker and G.D.Sullivan, University of Reading.
- Feature Aggregation in Iconic Model Evaluation* 19
K.Brisdon, G.D.Sullivan and K.D.Baker, University of Reading.
- Alvey MMI-007 Vehicle Exemplar: The Development of Reasoning Strategies* 25
K.D.Baker and G.D.Sullivan, University of Reading.

SESSION 3

- An Experiment in Model Based Boundary Detection* 31
P.Azzopardi, D.Pycock, C.J.Taylor and A.C.Wareham, University of Manchester.
- DEMOB: An Object-oriented Application Generator for Image Processing* 37
N.Bryson, D.Cooper, J.Graham, D.Pycock, C.J.Taylor and P.W.Woods, University of Manchester.
- A Frame-based System for Modelling and Executing Visual Tasks* 45
P.W.Woods, D.Pycock and C.J.Taylor, University of Manchester.
- Object Cues for Model-based Image Interpretation* 53
A.Thornham, C.J.Taylor and D.Cooper, University of Manchester.
- Boundary Cue Operators for Model-based Image Processing* 59
J.Graham and C.J.Taylor, University of Manchester.
- An Object Location Strategy using Shape and Grey-level Models* 65
D.Cooper, N.Bryson, and C.J.Taylor, University of Manchester.

SESSION 4

- An Analysis of Lowe's Model-based Vision System* 73
A.M.McIvor, University of Oxford.
- Disordered Databases and Ordered Explanations* 79
T.J.Parson, British Aerospace, Hatfield.
- Constrained Constructive Solid Geometry a Unique Representation of Scenes* 91
J.A.D.W.Anderson, G.D.Sullivan and K.D.Baker, University of Reading.
- COMPACT - A Surface Representation Scheme* 97
P.Grossman, GEC Hirst Research Centre.
- Polyhedral Object Recognition with Sparse Data in SIMD Processing Mode* 103
D.Holder and H.Buxton, Queen Mary College London.

<i>Analysis of 3D Texture</i>	111
A.Blake and C.Marinos, University of Oxford.	
SESSION 5	
<i>Digital Elevation Model Production by Stereo-matching SPOT Image Pairs: A Comparison of Algorithms</i>	117
T.Day and J.P.Muller, University College London.	
<i>A "Region-Growing" Algorithm for Matching of Terrain Images</i>	123
G.P.Otto and T.K.W.Chau, University College London.	
<i>Improved Local Flow</i>	129
S.Gong, University of Oxford.	
<i>Visual Interpretation of Cylindrical Deformation - A Sideways Look at Contour Motion</i>	135
R.M.Cameron-Jones University of Edinburgh.	
<i>Edge Detection in Dynamic Vision</i>	141
A.M.McIvor, University of Oxford	
SESSION 6	
<i>A Combined Corner and Edge Detector</i>	147
C.Harris and M.Stephens, Plessey Research.	
<i>Surface Reconstruction from Outdoor Image Sequences</i>	153
D.Charnley and R.J.Blissett, Plessey Research.	
<i>3D Wire-Frame Integration from Image Sequences</i>	159
M.Stephens & C.Harris	
<i>The Information Available to a Moving Observer from Specularities</i>	167
A.Zisserman, P.Giblin and A.Blake, University of Oxford.	
<i>Feature Extraction for Vision Guided Vehicles</i>	173
B.T.Thomas, E.L.Dagless, R.A.Lotufo, D.J.Milford, A.D.Morgan and J.F.Morrissey, University of Bristol.	
<i>Road Edge Tracking for Robot Road Following</i>	179
A.D.Morgan, E.L.Dagless, D.J.Milford and B.T.Thomas, University of Bristol.	
<i>Road Edge Extraction Using a Plan-View Image Transformation</i>	185
R.A.Lotufo, E.L.Dagless, D.J.Milford & B.T.Thomas, University of Bristol	
SESSION 7	
<i>On the Optimal Edge Detector</i>	191
M.Petrou, Rutherford Appleton Laboratory.	
<i>Computing the Visible Invariance in Grey Scale Imagery on the Transputer</i>	197
N.A.Chalabi, University of Strathclyde.	
<i>Morphological Feature Detection</i>	203
J.A.Noble, University of Oxford	

A Hierarchical Rule-Based Method for Image Segmentation using Maximum-Gradient Profiles 211
A.C.F.Colchester, R.T.Ritchings and N.D.Kodikara,
Guy's Hospital London.

Using a Mixed Wave/Diffusion Process to Elicit the Symmetry Set 221
G.L.Scott and S.C.Turner, University of Oxford.

SESSION 8

Forensic Textile Fibre Matching by Multiresolution Planning and Colour Space Pattern Recognition 229
G.J.McEwen and A.J.Wilkinson, The Queen's University of Belfast.

Grammar-Driven Interpretation of Engineering Drawings, 237
S.H.Joseph and T.P.Pridmore, University of Sheffield

Automatic Analysis of Diffraction Fringe Patterns in Electron Microscopy 243
M.Blunck, University of Bremen.

Automatic Extraction of High Texture Features used for Patient Realignment in Medical Imaging of the Head 247
N.Saeed, T.S.Durrani and S.Marshall, University of Strathclyde.

Tracking Cataract by the Four-Line Method 253
K.J.Hanna, University of Oxford.

SESSION 10

Detection of Circular Arcs in Images 259
P.Rosin and G.A.W.West, Guy's Hospital London.

Ellipse Detection using the Hough Transform 265
H.K.Yuen, J.Illingworth and J.Kittler, University of Surrey.

Use of the Radon Transform as a Method of Extracting Symbolic Representations of Shape in Two Dimensions 273
V.Leavers, King's College London.

An Alternative to Graph Matching for Locating Objects from their Salient Features 281
E.R.Davies, Royal Holloway & Bedford New College.

Segmentation and Concatenation of Edgel Lists by Dynamic Programming and Stochastic Models 287
A.C.Sleigh, Royal Signals and Radar Establishment.

Avoiding Class-conditional Independence Assumptions in Image Classification 297
I.Poole, University College London.

