

# **Programme**

## **SUNDAY**

7:00 - 9:00pm – Registration  
8:00 - 10:00pm - Evening event

## **MONDAY**

8:00 - 9:00am - Registration  
9:00am – Opening

### **Session 1 - Feature Extraction**

Chair: Peter Gough

Proceedings

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09:20	M. J. Cree, M. E. Jefferies and J. T. Baker <i>Using 3D visual landmarks to recognise local spaces</i>	1
09:40	J. C. Ye, Y. Bresler and P. Moulin <i>Fundamental uncertainty in estimating 3-D parametric surfaces for imaging applications</i>	7
10:00	A. M. Woodward and P. J. Delmas <i>Towards a low cost realistic human face modeling and animation framework</i>	11
10:20	G. Chetty and M. Wagner <i>Automated lip feature extraction for liveness verification in audio-video authentication</i>	17
11:00	A. S. Mian, D. Mathers, M. Bennamoun, R. A. Owens and G. Hingston <i>3D face recognition by matching shape descriptors</i>	23

11:00 - 11:30 Break

## Session 2 - Navigation and Tracking

Chair: Rick Millane

### MONDAY

- 11:30 J. van der Linden, J. Li, R. Lobb, K. Novins and B. Wünsche  
*Strider: a simple and effective terrain navigation controller* 95
- 11:50 R. D. Green  
*Biometric authentication of gait, anthropometric data and movement disorders* 101
- 12:10 D. R. Wichmann and B. C. Wünsche  
*Automated route finding on digital terrains* 107
- 12:30 W. Smart and M. Zhang  
*Tracking object positions in real-time video using genetic programming* 113

12:50 - 2:00 Lunch and poster viewing : Poster Session 1

### Poster Session 1 - Feature Extraction, Navigation and Tracking, Medical & Biological Applications, and Optics and Calibration

#### Feature Extraction

- P. Delmas, A. M. Woodward and P. Leclercq  
*Can stereo-matching algorithms accurately render face features?* 29
- H. Goto and S. Kaneko  
*Synergetic OCR : a framework for network-oriented cooperative OCR systems* 35
- C.-F. Chen, M.-C. Huang, C.-I. Chen and C.-Y. Chen  
*3D face recognition using discrete cosine transform approach* 41
- Y. Huang and R. Klette  
*Shape analysis using property estimators in stereology and digital geometry* 47
- O. Hunt and R. Mukundan  
*A comparison of discrete orthogonal basis functions for image compression* 53

W.-N. Lie and H.-Y. Chen <i>MPEG sports video retrieval based on compressed domain features and relevance feedback</i>	59
J. Liu and G. Gimel'farb <i>Accuracy of stereo reconstruction by minimum cut, symmetric dynamic programming, and correlation</i>	65
A. Punchihewa, D. G. Bailey and R. M. Hodgson <i>MPEG-4 and the challenges of benchmarking its implementations for picture quality</i>	71
L. Shen and L. Bai <i>AdaBoost Gabor feature selection for classification</i>	77
T. Wang, W. Zhao and R. Green <i>A study on real-time face recognition</i>	83
N. G. Yee and Z. Qi <i>Selection of spectral predictors using signal to noise ratios</i>	89

### **Navigation and Tracking**

D. Bailey and G. Sen Gupta <i>Error assessment of robot soccer imaging system</i>	119
G. C. De Silva, L. C. De Silva and S. Ranganath <i>Tracking and indexing human actions in video image sequences</i>	125
R. N. Grant and R. D. Green <i>Tracking colour movement through colour space for real time human motion capture to drive an Avatar</i>	131
J. Morris and P. Leclercq <i>Stereovision for collision avoidance</i>	137
K. Vaghani and R. Green <i>Real-time motion capture in public spaces using stereo vision</i>	143
A. Wedel and R. Green <i>Robot guidance using OPT2 FLOW</i>	149
D. Wedge, D. Huynh and P. Kovesi <i>Tracking footballs through clutter in broadcast digital videos</i>	155

### **Medical & Biological Applications**

L. Deng, D. J. Bertinshaw, R. Klette, G. Klette and D. Jeffries <i>Footprint identification of weta and other insects</i>	191
S. Luo and Q. Hu <i>Magnetic resonance image segmentation using 3D filtering and surface evolution</i>	197

S. Marsland and C. Twining  
*A minimum description length objective function for groupwise non-rigid  
image registration* 203

### **Optics and Calibration**

J. L. Mohr, R. A. Johnston, R. G. Lane and P. L. Cottrell  
*Adaptive optics at Mount John University Observatory* 233

R. Reulke, S. Becker and N. Haala  
*Determination and improvement of spatial resolution of the  
CCD-line-scanner system ADS40* 237

## **Session 3 - Medical & Biological Applications**

Chair: Peter Hilton

### **MONDAY**

2:00 T. Guodong and M. J. Cree  
*Detection of retinal blood vessels in colour fundus images* 161

2:20 N. Hasler, R. Klette, B. Rosenhahn and W. Agnew  
*Footprint recognition of rodents and insects* 167

2:40 C. H. Yoon, J. Chen, J. R. Maclaren, B. Bödvarsson, S. Klim, S. Mortensen, M. Mørkebjerg, P.  
K. Luther, J. M. Squire, A. Bainbridge-Smith, P. J. Bones and R. P. Millane  
*Automated analysis of electron micrographs of muscle cross-sections* 173

3:00 B. Li, B. C. Wünsche and A. A. Young  
*Fast semi-automatic reconstruction of heart pathology from MRI data  
with soft objects* 179

3:20 A. Stilinovic, C. R. Green, R. Klette, S. Franke, G. Klette, D. L. Becker  
*Texture analysis of collagen fibers in scar tissue* 185

3:40 - 4:20 - Break

## Session 4 - Optics and Calibration

Chair: David Pairman

### MONDAY

- 4:20 R. A. Johnston, J. L. Mohr, P. L. Cottrell and R. G. Lane  
*A bread-board SCIDAR system at Mount John* 209
- 4:40 R. J. Valkenburg and D. W. Penman  
*Accurate unsupervised camera intrinsic calibration* 215
- 5:00 R. J. Valkenburg, X. Lin and R. Klette  
*Self-calibration of target positions using geometric algebra* 221
- 5:20 T. Y. Chew, R. M. Clare and R. G. Lane  
*A Cramer-Rao bound analysis of the Shack-Hartmann and pyramid wavefront sensors* 227

7:30 - Dinner

Ma Maison, 6 Rue Balguerie

### TUESDAY

## Session 5 - Applications

Chair: Reinhard Klette

- 08:30 R. A. Johnston, K. Barnes, T. Lovell-Smith and N. B. Price  
*Use of a hand-held laser scanner in palaeontology: a 3D model of a plesiosaur fossil* 243
- 08:50 B. Cervin, C. Mills and B. C. Wünsche  
*A 3D interface for an unmanned aerial vehicle* 249

09:10	I.-T. Huang, K. L. Novins and B. C. Wünsche	
	<i>Improved billboard clouds for extreme model simplification</i>	255
09:30	C. Gough, X. Gu and M. Billinghurst	
	<i>Parallelism for performance in AR applications</i>	261
09:50	J. van der Linden and J. Gustavsson	
	<i>Jukebox: bad computer vision for fun and profit</i>	267

10:10—10:40—Break

**Session 6 - Rendering and Modelling**  
Chair: Bredan McCane

**TUESDAY**

10:40	G. Sen Gupta, D. Bailey and C. Messom	
	<i>A new colour space for efficient and robust segmentation</i>	315
11:00	T. Yang, B. C. Wünsche and R. J. Lobb	
	<i>Game engine support for terrain rendering in architectural design</i>	321
11:20	A. Wood, B. McCane and S. A. King	
	<i>Ray tracing arbitrary objects on the GPU</i>	327
11:40	A. J. Hunter and M. P. Hayes	
	<i>A distributed acoustic renderer for SAS image simulation</i>	333

12:00 - 1:20 - Lunch and poster viewing : Poster Session 2

## Poster Session 2 - Applications, Rendering and Modelling, Detection and Classification

### Applications

- P. J. Barclay, M. P. Hayes and P. T. Gough  
*Multi-receiver, multi-frequency maximum likelihood synthetic aperture sonar interferometry* 273
- A.P. Bradley and P. C. Bamford  
*A one-pass extended depth of field algorithm based on the over-complete discrete wavelet transform* 279
- R. G. Brown, R. P. Millane, E. Enevoldson and J. E. Murray  
*Imaging mountain waves using sailplane flight data* 285
- K. T. Gribbon, D. G. Bailey and C. T. Johnston  
*Colour edge enhancement* 291
- C. T. Johnston, D. G. Bailey, P. Lyons and K. T. Gribbon  
*Formalisation of a visual environment for real time image processing in hardware (VERTIPH)* 297
- D. Krause and R. Green  
*MobileCV: making mobile phones take beautiful pictures* 303
- B. Rosenhahn, H. Ho and R. Klette  
*Block matching based 2D-3D pose estimation* 309

### Rendering and Modelling

- A. N. Chalmers, S. Soltic and R. Jammalamadaka  
*Image colour management and modelling using CIECAM02* 339
- A. Clark and R. Green  
*3D model generation from a stereo camera using multiple viewpoints* 345
- R. Jammalamadaka and A. N. Chalmers  
*Measurement and modelling of gonio-apparent surfaces* 351
- J. Burgess and S. A. King  
*A system for watercolour rendering* 357
- M. Lancelle and D. W. Fellner  
*Current issues on 3D city models* 363
- M. Qi, A. Haider, R. P. Millane and G. M. Smart  
*Analysis of river bed stones from digital elevation models* 369
- T. Wei and R. Klette  
*Two-scan method for surface height from gradient vector fields* 375

## **Detection and Classification**

H. Chen and X. Wang <i>Focal length and registration correction for building panorama from photographs</i>	411
P. Fan, G. Gimel'farb and L. Yu <i>Partial ground truth for evaluating texture segmentation algorithms</i>	417
H. Gao and R. Green <i>State-based ball detection and tracking for cricket training</i>	423
C. Gough, X. Gu and R. Green <i>Improving the robustness of occluded marker detection in the AR Toolkit application</i>	429
Z. Q. Huang and Z. Jiang <i>Synchronisation with rescanned images and its application to image watermark detection</i>	435
M. Lett and M. Zhang <i>New fitness functions in genetic programming for object detection</i>	441
J. Shin and R. Green <i>Finding added/removed object from scene</i>	447
L. Yu and G. Gimel'farb <i>Performance evaluation of texture-based image retrieval</i>	453
Y. Zhang and M. Zhang <i>A new program structure in genetic programming for object classification</i>	459

## **Session 7 - Detection and Classification**

Chair: Stephen McNeill

### **TUESDAY**

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1:40 D. Zhou and G. Gimel'farb <i>Texel-based texture analysis and synthesis</i>	387
2:00 J. Zhang and D. Deng	

	<i>Indoor-outdoor scene classification by combining multiple precision-boosted classifiers</i>	393
2:20	J. Mackie and B. McCane	
	<i>Finger detection with decision trees</i>	399
2:40	Y. Xin, S. Liao and M. Pawlak	
	<i>Using Zernike moments selectively for invariant watermarking</i>	405

Programme concludes at 3pm