

Proceedings

Computer Graphics, Imaging and Visualisation

– Modern Techniques and Applications –

Penang, Malaysia
August 26–28, 2008



Los Alamitos, California
Washington • Tokyo



Fifth International Conference on Computer Graphics, Imaging and Visualization

CGIV 2008

Table of Contents

Preface	x
International Programme and Reviewing Committee	xi

Part I: Computer Graphics

Session 1: Computer Graphics

Kohonen-Swarm Algorithm for Unstructured Data in Surface Reconstruction	5
<i>Fadni Bin Forkan and Siti Mariyam Hj Shamsuddin</i>	
Object Based Clustering Using Hybrid Algorithms	12
<i>Nor Hafizah Abd. Razak, Noridayu Manshor, Mandava Rajeswari, and Dhanesh Ramachandram</i>	
Simulating the Coalescence and Separation of Bubble and Foam by Particle Level Set Method	18
<i>Ryo Shimada, Sejuti Rahman, and Yoichiro Kawaguchi</i>	
Web Based Distributed Marine Education System	23
<i>Yang Xiao and Jin Yicheng</i>	
Real-Time Simulation of Granular Materials Using Graphics Hardware	28
<i>Ren Yasuda, Takahiro Harada, and Yoichiro Kawaguchi</i>	
Evolution of Computer Graphics and Its impact on Engineering Product Development	32
<i>K. Sathyanarayana and G.V.V. Ravi Kumar</i>	
Real-Time Antialiasing of Edges and Contours of Point Rendered Implicit Surfaces	38
<i>Dirk J. Harbinson, Ron J. Balsys, and Kevin G. Suffern</i>	

Session 2: Digital Art, Animation, and Multimedia

Understanding the Technicalities of Photorealistic 3D Environments to Support Cinematography and Composition for Film and Animation	49
<i>Jong Sze Joon, Soon Eu Hui, and Yuen May Chan</i>	
A Stochastic ARG Matching Based Video Scene Search System with a Sketch Query Interface	55
<i>Naoto Nakamura, Shigeru Takano, and Yoshihiro Okada</i>	
An Animated Cryptographic Learning Object	61
<i>Rachid Anane, Kevin Purohit, and Georgios Theodoropoulos</i>	
User Experience Using Motion Capture: Simulation of Human Motion for Multimedia Applications	69
<i>Jong Sze Joon, Harold Thwaites, and Khong Chee Weng</i>	
A Three-Dimensional Map to Outline Multimedia Path: Representing and Memorizing Heritage and Architectural Information	75
<i>Sandro Varano, Didier Bur, and Jean-Claude Bignon</i>	

Session 3: Augmented, Mixed, and Virtual Reality

Development of Robot Simulation Software for Five Joints Mitsubishi RV-2AJ Robot Using MATLAB/Simulink and V-Realm Builder	83
<i>Muhammad Ikhwan Jambak, Habibollah Haron, and Dewi Nasien</i>	
Development of a Vision System for a Floor Marking Mobile Robot	88
<i>Zulkifli Zainal Abidin, Syamsul Bahrin Abdul Hamid, Ahmad Anis Abdul Aziz, and Azlan Ab. Malek</i>	
The Design, Development and Evaluation of Virtual Reality Learning Environment for Numeracy Concepts Using 3D Virtual Manipulatives	93
<i>L. Daghestani, R. D. Ward, Z. Xu, and H. Al-Nuaim</i>	
Implementation of Virtual Environment Using VIRTTOOLS	101
<i>Mustafa Agil Muhamad Balbed, Nazrita Ibrahim, and Azmi Mohd Yusof</i>	

Session 4: Computer-Aided Geometric Design and Graphics

Efficient Algorithms for Non-Rational and Rational Bézier Curves	109
<i>Natasha Dejdumrong</i>	
An Approach to the Feature-Based Comparisons for the Rational Curves	115
<i>Chanon Aphirukmatakun and Natasha Dejdumrong</i>	
Fair Path Planning with a Single Cubic Spiral Segment	121
<i>Zulfiqar Habib and Manabu Sakai</i>	
A Surgical Simulation System Supporting COLLADA-Based File Format	126
<i>Katsunori Miyahara and Yoshihiro Okada</i>	
Skeleton Based 3D Model Morphing Using Barycentric Map	132
<i>Kosuke Kaneko and Yoshihiro Okada</i>	

Specification and Implementation of a Folding Parametric Operator to Assist Architectural Conception at the Drafting Stage	138
<i>Jean-Paul Wetzel, Salim Belblidia, and Jean-Claude Bignon</i>	
Bezier Triangular Neural Network	143
<i>Tang van To and Kotchakorn Sa-Ingthong</i>	
A Product Design Using an S-Shaped and C-Shaped Transition Curves	149
<i>Saifudin Hafiz Yahaya, Jamaludin Md. Ali, and Muhammad Hafidz Fazli Md. Fauadi</i>	
G3 Transition Curve Between Two Straight Lines	154
<i>Azhar Ahmad and Jamaluddin Md. Ali.</i>	

Part II: Imaging

Session 5: Imaging

Real Time Colour Image Segmentation with Non-Symmetric Gaussian Membership Functions	165
<i>Omid Sojodishijani, Vahid Rostami, and Abd Rahman Ramli</i>	
Neural Network Implementation of Image Edge Detectors	171
<i>Majid Aghababaie and Gholamali Rezairad</i>	
Tampered Image Detection Using Image Matching	174
<i>Zhenghao Li, A. Y. C. Nee, S. K. Ong, and Weiguo Gong</i>	
Image Texture Classification Using Combined Grey Level Co-Occurrence Probabilities and Support Vector Machines	180
<i>Hee-Kooi Khoo, Hong-Choon Ong, and Ya-Ping Wong</i>	
Textured Renyi Entropy for Image Thresholding	185
<i>Ahmad Adel Abu Shareha, Mandava Rajeswari, and Dhanesh Ramachandram</i>	
EASI Modelling Algorithms for Aerosol-Cloud Distribution Analysis	193
<i>A. N. Alias, M. Z. MatJafri, H. S. Lim, K. Abdullah, and N. Mohd. Saleh</i>	
Improved Canny Edges Using Ant Colony Optimization	197
<i>Ya-Ping Wong, Victor Chien-Ming Soh, Kar-Weng Ban, and Yoon-Teck Bau</i>	

Session 6: Forensic Digital Imaging

Automatic Fingerprint Identification Using Gray Hopfield Neural Network Improved by Run-Length Encoding	205
<i>Kussay Nugamesh Mutter, Zubir Mat Jafri, and Azlan Abdul Aziz</i>	
Public Key Encryption of Images and Videos in Real Time Using Chebyshev Maps	211
<i>K. Ganesan, Ishan Singh, and Mansi Narain</i>	
Fingerprint Liveness Detection Using Curvelet Energy and Co-Occurrence Signatures	217
<i>Shankar Bhausaheb Nikam and Suneeta Agarwal</i>	
Neighbourhood Discriminant Locally Linear Embedding in Face Recognition	223
<i>Pang Ying Han, Andrew Teoh Beng Jin, and Wong Eng Kiong</i>	

Normalized Cross-Correlation Based Fingerprint Matching	229
<i>Deepak Kumar Karna, Suneeta Agarwal, and Shankar Nikam</i>	

Session 7: Image/Video Analysis for Pattern Recognition

Overlaid Text Recognition for Matching Soccer-Concept Keywords	235
<i>Alfian Abdul Halin, Mandava Rajeswari, and Dhanesh Ramachandram</i>	
Integrating Audio Visual Data for Human Action Detection	242
<i>Lili Nurliyana Abdullah and Shahrul Azman Mohd Noah</i>	
Handwritten Cursive Jawi Character Recognition: A Survey	247
<i>Mohammad Faizul Nasrudin, Khairuddin Omar, Mohamad Shanudin Zakaria, and Liong Choong Yeun</i>	

Session 8: Intelligent Recognition Techniques, Applications, Systems, and Tools

Skew Estimation and Correction of Text Using Bounding Box	259
<i>Muhammad Sarfraz and Zeehasham Rasheed</i>	
Gaussian Rule Based Fuzzy (GRBF) Membership Edge Detection on Hand Phantom Radiograph Images	265
<i>Noor Elaiza Abdul Khalid, Mazani Manaf, Mohd Ezane Aziz, Noorhayati Mohamed Noor, and Norsyuhazza Zainol</i>	
Object Class Recognition Using NEAT-Evolved Artificial Neural Network	271
<i>Mozaherul Hoque Abul Hasanat, Siti Zubaidah Harun, Dhanesh Ramachandram, and Mandava Rajeswari</i>	
LSP Trajectory Analysis for Speech Recognition	276
<i>J. Onshaunjit and J. Srinonchat</i>	
Position Error Inspection for Mounting Wafer in Cleaning Device	280
<i>Jung Woo Lee, Liliana, Byung-Gook Lee, and Joon-Jae Lee</i>	
An Intelligent Tutoring System for Improving Application Accessibility of Disabled Learners	286
<i>Hussein Karam Hussein Abd El-Sattar</i>	

Part III: Visualisation

Session 9: Data and Information Visualisation

Visualization of Hybrid, N-Body and Octree-Based Adaptive Mesh Resolution Parallelized Simulations	295
<i>D. Pomarede, Y. Fidaali, and R. Teyssier</i>	
A Visual Analytics Framework for the Examination Timetabling Problem	305
<i>J. Joshua Thomas, Ahamad Tajudin Khader, and Bahari Belaton</i>	
A Usability Study on the Use of Multi-Context Visualization	311
<i>Mao Lin Huang, Jie Liang, and Quang Vinh Nguyen</i>	
A New Framework for Plot-Based Interactive Storytelling Generation	317
<i>Hussein Karam Hussein Abd El-Sattar</i>	

Learning in the Recurrent Hopfield Network	323
<i>Saratha Sathasivam</i>	
Parallel and Distributed Visualization: The State of the Art	329
<i>Ali Meligy</i>	
Session 10: Bio-Medical Visualisation	
Segmentation of CT Brain Images Using K-Means and EM Clustering	339
<i>Tong Hau Lee, Mohammad Faizal Ahmad Fauzi, and Ryoichi Komiya</i>	
Comparison of Denoising Techniques Applied on Low-Field MR Brain Images	345
<i>N. F. Ishak, M. J. Gangeh, and R. Logeswaran</i>	
Post Processing of Breast Phantom MRI-156 Images Using Snake Algorithm	350
<i>Wan Eny Zarina W. Abd. Rahman, Arsmah Ibrahim, Zainab Abu Bakar, Rozi Mahmud, Md Saion Salikin, and Mazani Manaf</i>	
Automatic Signature Recognition and Verification Using Principal Components Analysis	356
<i>I. A. Ismail, M. A. Ramadan, T. El Danf, and A. H. Samak</i>	
Parallel Visualisation Approach of a 3D Heart Model	362
<i>Kalpana Kanthasamy and Alwin Kumar Rathinam</i>	
Session 11: Spatial/Geographic Data Visualisation	
Visual Analysis of Usage Efficiency of Library Books	371
<i>Kan Liu and Ping Liu</i>	
Algorithm for TSS Mapping Using Satellite Data for Penang Island, Malaysia	376
<i>H. S. Lim, M. Z. MatJafri, K. Abdullah, A. N. Alias, J. M. Rajab, and N. Mohd. Saleh</i>	
Remote Sensing of Aerosols over Penang Island from Satellite Measurements	380
<i>C. K. Sim, H. S. Lim, C. J. Wong, M. Z. MatJafri, and K. Abdullah</i>	
Algorithm for PM2.5 Mapping over Penang Island, Malaysia, Using SPOT Satellite Data	385
<i>H. S. Lim, M. Z. MatJafri, K. Abdullah, A. N. Alias, J. M. Rajab, and N. Mohd. Saleh</i>	
A Newly Computational Intelligence Algorithm for Air Quality Mapping Using SPOT Image over Penang, Malaysia	389
<i>C. E. Joanna Tan, H. S. Lim, C. J. Wong, M. Z. MatJafri, and K. Abdullah</i>	
A Real Time Simulation of Flood Hazard	393
<i>Jasrul Nizam Ghazali and Amirrudin Kamsin</i>	
Comparison of Turbidity Measurement by MODIS and AVHRR Images	398
<i>H. G. Ng, M. Z. MatJafri, K. Abdullah, and A. N. Alias</i>	
Author Index	404