# CGIV 2008

## Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preface</td>
<td>x</td>
</tr>
<tr>
<td>International Programme and Reviewing Committee</td>
<td>xi</td>
</tr>
</tbody>
</table>

## Part I: Computer Graphics

### Session 1: Computer Graphics

- Kohonen-Swarm Algorithm for Unstructured Data in Surface Reconstruction ................................................. 5
  - Fadni Bin Forkan and Siti Mariyam Hj Shamsuddin
- Object Based Clustering Using Hybrid Algorithms ................................................................. 12
  - Nor Hafizah Abd. Razak, Noridayu Manshor, Mandava Rajeswari, and Dhanesh Ramachandram
- Simulating the Coalescence and Separation of Bubble and Foam by Particle Level Set Method ........................... 18
  - Ryo Shimada, Sejuti Rahman, and Yoichiro Kawaguchi
- Web Based Distributed Marine Education System ............................................................................. 23
  - Yang Xiao and Jin Yicheng
  - Ren Yasuda, Takahiro Harada, and Yoichiro Kawaguchi
  - K. Sathyanarayana and G.V.V. Ravi Kumar
- Real-Time Antialiasing of Edges and Contours of Point Rendered Implicit Surfaces ............................. 38
  - Dirk J. Harbinson, Ron J. Balsys, and Kevin G. Suffern
Session 2: Digital Art, Animation, and Multimedia

Understanding the Technicalities of Photorealistic 3D Environments to Support Cinematography and Composition for Film and Animation ...........................................................49
   Jong Sze Joon, Soon Eu Hui, and Yuen May Chan

A Stochastic ARG Matching Based Video Scene Search System with a Sketch Query Interface ..........................................................................................................................................................55
   Naoto Nakamura, Shigeru Takano, and Yoshihiro Okada

An Animated Cryptographic Learning Object ......................................................................................................61
   Rachid Anane, Kevin Purohit, and Georgios Theodoropoulos

User Experience Using Motion Capture: Simulation of Human Motion for Multimedia Applications ...........................................................69
   Jong Sze Joon, Harold Thwaites, and Khong Chee Weng

A Three-Dimensional Map to Outline Multimedia Path: Representing and Memorizing Heritage and Architectural Information ...................................................................................75
   Sandro Varano, Didier Bur, and Jean-Claude Bignon

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
   Muhammad Ikhwan Jambak, Habibollah Haron, and Dewi Nasien

Development of a Vision System for a Floor Marking Mobile Robot ...................................................................................88
   Zulkifli Zainal Abidin, Syamsul Bahrain Abdul Hamid, Ahmad Anis Abdul Aziz, and Azlan Ab. Malek

The Design, Development and Evaluation of Virtual Reality Learning Environment for Numeracy Concepts Using 3D Virtual Manipulatives ...........................................................93
   L. Daghestani, R. D. Ward, Z. Xu, and H. Al-Nuaim

Implementation of Virtual Environment Using VIRTOOLS ............................................................................101
   Mustafa Agil Muhamad Balbed, Nazrita Ibrahim, and Azmi Mohd Yusof

Session 4: Computer-Aided Geometric Design and Graphics

Efficient Algorithms for Non-Rational and Rational Bézier Curves ...........................................................109
   Natasha Dejdumrong

An Approach to the Feature-Based Comparisons for the Rational Curves ...........................................................115
   Chanon Aphirukmatakun and Natasha Dejdumrong

Fair Path Planning with a Single Cubic Spiral Segment ...................................................................................121
   Zulfiqar Habib and Manabu Sakai

A Surgical Simulation System Supporting COLLADA-Based File Format ...........................................................126
   Katsunori Miyahara and Yoshihiro Okada

Skeleton Based 3D Model Morphing Using Barycentric Map ............................................................................132
   Kosuke Kaneko and Yoshihiro Okada
Part II: Imaging

Session 5: Imaging

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

Session 6: Forensic Digital Imaging

Automatic Fingerprint Identification Using Gray Hopfield Neural Network
Improved by Run-Length Encoding ............................................................................................................................................................ 205
  Kussay Nugamesh Mutter, Zubir Mat Jafri, and Azlan Abdul Aziz
Public Key Encryption of Images and Videos in Real Time Using Chebyshev Maps .................................................................................................................. 211
  K. Ganesan, Ishan Singh, and Mansi Narain
Fingerprint Liveness Detection Using Curvelet Energy and Co-Occurrence Signatures ........................................................................................................................................ 217
  Shankar Bhauasaheb Nikam and Suneeta Agarwal
Neighbourhood Discriminant Locally Linear Embedding in Face Recognition ........................................................................................................... 223
  Pang Ying Han, Andrew Teoh Beng Jin, and Wong Eng Kiong
Normalized Cross-Correlation Based Fingerprint Matching .................................................................229

Deepak Kumar Karna, Suneeta Agarwal, and Shankar Nikam

Session 7: Image/Video Analysis for Pattern Recognition

Overlaid Text Recognition for Matching Soccer-Concept Keywords ................................................................235

Alfian Abdul Halin, Mandava Rajeswari, and Dhanesh Ramachandram

Integrating Audio Visual Data for Human Action Detection ........................................................................242

Lili Nurliyana Abdullah and Shahrul Azman Mohd Noah

Handwritten Cursive Jawi Character Recognition: A Survey ...........................................................................247

Mohammad Faidzul Nasrudin, Khairuddin Omar, Mohamad Shanudin Zakaria, and Liong Choong Yeun

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

Skew Estimation and Correction of Text Using Bounding Box .................................................................259

Muhammad Sarfraz and Zeehasham Rasheed

Gaussian Rule Based Fuzzy (GRBF) Membership Edge Detection on Hand Radiograph Images .................265

Noor Elaiza Abdul Khalid, Mazani Manaf, Mohd Ezane Aziz, Noorhayati Mohamed Noor, and Norsyuhaiza Zainol

Object Class Recognition Using NEAT-Evolved Artificial Neural Network .................................................271

Mozaherul Hoque Abul Hasanat, Siti Zubaidah Harun, Dhanesh Ramachandram, and Mandava Rajeswari

LSP Trajectory Analysis for Speech Recognition .........................................................................................276

J. Onshaunjit and J. Srinonchat

Position Error Inspection for Mounting Wafer in Cleaning Device .............................................................280

Jung Woo Lee, Liliana, Byung-Gook Lee, and Joon-Jae Lee

An Intelligent Tutoring System for Improving Application Accessibility of Disabled Learners ..................286

Hussein Karam Hussein Abd El-Sattar

Part III: Visualisation

Session 9: Data and Information Visualisation

Visualization of Hybrid, N-Body and Octree-Based Adaptive Mesh Resolution Parallelized Simulations .......295

D. Pomarede, Y. Fidaali, and R. Teyssier

A Visual Analytics Framework for the Examination Timetabling Problem .................................................305

J. Joshua Thomas, Ahamad Tajudin Khader, and Bahari Belaton

A Usability Study on the Use of Multi-Context Visualization .....................................................................311

Mao Lin Huang, Jie Liang, and Quang Vinh Nguyen

A New Framework for Plot-Based Interactive Storytelling Generation .....................................................317

Hussein Karam Hussein Abd El-Sattar
Session 10: Bio-Medical Visualisation

Segmentation of CT Brain Images Using K-Means and EM Clustering
Tong Hau Lee, Mohammad Faizal Ahmad Fauzi, and Ryoichi Komiya

Comparison of Denoising Techniques Applied on Low-Field MR Brain Images
N. F. Ishak, M. J. Gangeh, and R. Logeswaran

Post Processing of Breast Phantom MRI-156 Images Using Snake Algorithm
Wan Eny Zarina W. Abd. Rahman, Arsmah Ibrahim, Zainab Abu Bakar, Rozi Mahmud, Md Saion Salikin, and Mazani Manaf

Automatic Signature Recognition and Verification Using Principal Components Analysis
I. A. Ismail, M. A. Ramadan, T. El Danf, and A. H. Samak

Parallel Visualisation Approach of a 3D Heart Model
Kalpana Kanthasamy and Alwin Kumar Rathinam

Session 11: Spatial/Geographic Data Visualisation

Visual Analysis of Usage Efficiency of Library Books
Kan Liu and Ping Liu

Algorithm for TSS Mapping Using Satellite Data for Penang Island, Malaysia

Remote Sensing of Aerosols over Penang Island from Satellite Measurements
C. K. Sim, H. S. Lim, C. J. Wong, M. Z. MatJafri, and K. Abdullah

Algorithm for PM2.5 Mapping over Penang Island, Malaysia, Using SPOT Satellite Data

A Newly Computational Intelligence Algorithm for Air Quality Mapping Using SPOT Image over Penang, Malaysia
C. E. Joanna Tan, H. S. Lim, C. J. Wong, M. Z. MatJafri, and K. Abdullah

A Real Time Simulation of Flood Hazard
Jasrul Nizam Ghazali and Amirrudin Kamsin

Comparison of Turbidity Measurement by MODIS and AVHRR Images
H. G. Ng, M. Z. MatJafri, K. Abdullah, and A. N. Alias

Author Index