

**Fourth Indian Conference on Computer Vision,  
Graphics & Image Processing**

**ICVGIP 2004**

**December 16-18, 2004**

**Indian Statistical Institute  
and  
Indian Unit for Pattern Recognition and Artificial Intelligence  
Science City, Kolkata**



**Indian Statistical Institute**

203 B T Road, Kolkata 700108

Phone: +91 33 25752915/25753108

Fax: +91 33 25776680/25773035

Email: [icvgip04@isical.ac.in](mailto:icvgip04@isical.ac.in)

<http://www.isical.ac.in/~icvgip04>

## **About ISI**

Founded by late Prof. P. C. Mahalanobis in 1931, the Indian Statistical Institute (ISI) has all along been playing a pioneering role in theoretical and applied research, promoting teaching and training in the fields of Statistics, Mathematics, Computer Science, Quality, Reliability, Operations Research, Economics and other related disciplines. It has made significant contributions to social and economic planning of the government of India, research and development in pure and applied Computer Science and in disseminating scientific quality control and quantitative management techniques for the industry. By the special act of parliament, the institute was declared an Institution of National Importance as early as in 1959.

ISI is hosting IUPRAI since its inception in 1982. The active leadership of ISI scientists in areas of digital computing and signal processing is a major force in the development of Computer Science in India. The institute offers graduate level courses in Computer Science that includes specialisation in areas of Pattern Recognition, Computer Vision, Image Processing, Soft Computing and Artificial Intelligence among others.

## **About IUPRAI**

Indian Unit for Pattern Recognition and Artificial Intelligence (IUPRAI) is the India country affiliate of International Association of Pattern Recognition (IAPR). In India there are a 300 strong close-knit PR community dedicated in developing algorithms and systems related to Pattern Recognition, Artificial Intelligence, Image Processing, Soft Computing and Knowledge based Computing Systems. The Indian PR community is active in publishing numerous articles in international journals and conferences. It was during the International Conference on Advances in Pattern Recognition and Digital Techniques (ICAPRDT) of 1982 IUPRAI was affiliated to IAPR in presence of Prof. King Sun Fu, former president of IAPR, Prof. Azriel Rosenfeld and Prof. Piere Devijver, the then president and secretary of IAPR and a host of other dignitaries. IUPRAI is associated with a number of conferences in India in areas related to PR. IUPRAI has been organizing the Indian Conference on Vision, Graphics and Image Processing (ICVGIP) and Workshop on Vision, Graphics and Image Processing (WVGIP) in every alternate year in collaboration with premier institutes and research labs.

## Foreword

*Welcome to the fourth Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP 2004). The Indian Statistical Institute, Kolkata in association with the Indian Unit for Pattern Recognition & Artificial Intelligence (IUPRAI) is organizing the ICVGIP 2004 at Science City, Kolkata. This conference is one of the most focused and well-attended events in the field of Computer Vision, Graphics and Image Processing. More than 110 papers are going to be presented in the next three days. More than 300 papers from 22 different countries were submitted giving the conference a true international flavour. You are aware that only about 40% of the total submitted papers are accepted in this conference. We are confident that you are going to have a technically rich experience at ICVGIP. We thank Programme Chairs and the Programme Committee members for their untiring efforts to select an excellent set of papers and a well-organized programme. The conference is preceded by tutorials presented by eminent international experts in the field of Vision and Image Processing. We thank the Tutorial Chair for organizing it.*

*We are indebted to a number of organizations for technical and financial support. We must note that because of their generous support we could provide fellowships to more than forty young scientists and senior faculty members. We thank the fellowship committee for making ICVGIP accessible to a wider audience. We are also thankful to our Advisory Committee without whose active input it would have been impossible to organize a conference of this stature.*

*No conference is successful without the active participations of conference attendees, especially those, who are coming to Kolkata for the first time. We welcome you all to Kolkata and we are sure you are going to have an exciting time here in this City of Joy. Should you need any assistance, do not hesitate to contact the registration desk or any one of us.*

*Enjoy ICVGIP 2004! Enjoy Kolkata!*

**Dwijesh DuttaMajumder**  
**Olivier Faugeras**  
(General Co-Chairs)

**Malay Kumar Kundu**  
(Organizing Chair)

## Committee

### General Co-Chairs

D Dutta Majumder

*Indian Statistical Institute, Kolkata, India*

O Faugeras

*INRIA, Sophia Antipolis, France*

### Programme Co-Chairs

B Chanda

*Indian Statistical Institute, Kolkata, India*

S Chandran

*Indian Institute of Technology, Bombay, India*

L S Davis

*Univ. of Maryland, Maryland, USA*

### Tutorial Chair

S K Pal

*Indian Statistical Institute, Kolkata, India*

### Fellowship Co-chairs

B B Bhattacharya

*Indian Statistical Institute, Kolkata, India*

P K Nandi

*Bengal Engineering College, Sibpore, India*

### Advisory Chair

K B Sinha

*Indian Statistical Institute,*

*Kolkata, India*

### Organizing Chair

M K Kundu

*Indian Statistical Institute,*

*Kolkata, India*

### Plenary Chair

P Anandan

*Microsoft Research, USA*

### Industry Forum and Liaison Co-Chairs

A Bagchi

*Indian Statistical Institute,*

*Kolkata, India*

B K Roy

*Indian Statistical Institute,*

*Kolkata, India*

## Advisory Committee

M G K Menon (ISI)

R A Mashelkar (CSIR)

V S Ramamurthy (DST, GoI)

M Nair (DoS, GoI)

Om Vikas (MIT, GoI)

A K Chakravarti (MIT, GoI)

R Narayana Murthy (INFOSYS)

N Sitaram (CAIR)

V K Aatre (DRDO)

R Kasturi (Univ. of South Florida)

R M Haralick (CUNY)

B L Deekshatulu (Univ. of Hyderabad)

B Yegnanarayana (IIT Madras)

B N Chatterjee (IIT Kharagpur)

K K Biswas (IIT Delhi)

Y V Venkatesh (IISc Bangalore)

L M Patnaik (IISc Bangalore)

B B Chaudhuri (ISI Kolkata)

## Program Committee

Subhashis Banerjee (IIT Delhi)  
Santanu Chaudhury (IIT Delhi)  
Prem K Kalra (IIT Delhi)  
Subhashis Choudhury (IIT Bombay)  
Ajay K Ray (IIT Kharagpur)  
A N Rajagopalan (IIT Madras)  
Phalguni Gupta (IIT Kanpur)  
C V Jawahar (IIIT Hyderabad)  
P J Narayanan (IIIT Hyderabad)  
K R Ramakrishnan (IISc Bangalore)  
B Kartikeyan (SAC Ahmedabad)  
Arun Pujari (Univ. of Hyderabad)  
C A Murthy (ISI Kolkata)  
M K Kundu (ISI Kolkata)  
B B Bhattacharya (ISI Kolkata)  
D P Mukherjee (ISI Kolkata)  
Umapada Pal (ISI Kolkata)  
S Bandopadhyay (Univ. of Calcutta)  
J K Aggarwal (Univ. of Texas, Austin)  
P Anandan (Microsoft Research)  
Amitabh Varshney (Univ. of Maryland)  
Subodh Kumar (Johns Hopkins University)  
Steve Seitz (Univ. of Washington)  
Visvanathan Ramesh (Siemens Research)  
R Chellappa (Univ. of Maryland)  
J Udupa (Univ. of Pennsylvania)  
Amarnath Gupta (Univ. of Southern California)  
R Nevatia (Univ. of Southern California)  
N Ahuja (UIUC/IIIT Hyderabad)  
H Niemann (Univ. of Erlangen)  
Andrew Zisserman (Oxford Univ.)  
Gabiella Sannti de Baja (Inst.di Cibernet., Italy)  
Murat Kunt (SFIT, Lausanne)  
Scott Acton (Univ. of Virginia)  
Vito de Gesu (Univ. of Palermo, Italy)  
W Pedrycz (Univ. of Alberta)

## Organizing Committee

<i>D P Mukherjee</i> (ISI), Convener	<i>S Choudhury</i> (ISI Kolkata)
<i>P Pal</i> (ISI Kolkata)	D Gayen (ISI Kolkata)
<i>D P Mandal</i> (ISI Kolkata)	S Sarkar (ISI Kolkata)
<i>A Ghosh</i> (ISI Kolkata)	D Mitra (ISI Kolkata)
<i>M Mitra</i> (ISI Kolkata)	I Dutta (ISI Kolkata)
<i>A Pal</i> (ISI Kolkata)	<i>A Dutta</i> (Univ. of Calcutta)
<i>U Pal</i> (ISI Kolkata)	<i>D Sarkar</i> (BARC Kolkata)
<i>S Mitra</i> (ISI Kolkata)	<i>A Das</i> (B E College)
<i>B Uma Shankar</i> (ISI Kolkata)	<i>S P Maity</i> (B E College)
<i>R K De</i> (ISI Kolkata)	<i>B C Dhara</i> (Jadavpur Univ.)
P Mahanta (ISI Kolkata)	<i>S K Saha</i> (Jadavpur Univ.)
R Chatterjee (ISI Kolkata)	<i>S Bandopadhyay</i> (WBUT)

## Industry Forum and Liaison Committee

<i>A V Rao</i> (DST, GoI)	<i>A Mukherjee</i> (TCS)
<i>J S Sehra</i> (MIT, GoI)	<i>B Bhattacharya</i> (HP India)
<i>M Saxena</i> (Siemens)	<i>D Moitra</i> (INFOSYS)
<i>N Gupta</i> (Adobe India)	<i>P Ghosh</i> (GE India)

## Additional Reviewers

Abhiram Ranade	Rajeev Kumar
Amitabha Mukherjee	Ramani Duraiswami
Anil K Jain	Richard Hartley
Arun Kumar	S N Merchant
Ashis Ghosh	Sanghamitra Bandopadhyay
Bidyut B Chaudhuri	Sharat Pankanti
B N Chatterji	Shree Nayar
B K Mohan	Shyamali Mukherjee
Bimal Roy	Suchi Bhandarkar
Debashis Ghosh	Sudeep Sarkar
David Doerbam	Sumantra Dutta Roy
Jayanta Mukherjee	Sukhendu Das
R Kasturi	Sushmita Mitra
Margrit Betke	Sven Dickinson
N R Pal	U B Desai
Pinakpani Pal	Venkatesh Kamat
Preeti Rao	Venu Govindan
R Balasubramannian	Vikram Gadre
R S Jadon	B Yegnanarayana
Rajat De	S Saha

## **Sponsors**

Adobe Systems India Pvt. Ltd.  
Association of Computing Machinery  
British Council, Kolkata  
BSNL  
CMC Limited  
Council of Industrial and Scientific Research (CSIR), GoI  
Defence Research and Development Organization (DRDO), GoI  
Dept. of Information and Technology (DST), GoI  
Dept. of Science and Technology (DIT), GoI  
Hewlett-Packard (HP) India Pvt. Ltd.  
Indian Institute of Technology Bombay, Mumbai  
Indian Statistical Institute  
Microsoft Research  
Online Solutions  
Siemens Information Systems Ltd.  
Sun Microsystems  
Tata Consultancy Services Ltd.  
The International Association for Pattern Recognition

**Wednesday, December 15, 2004**  
**Venue: Geology Auditorium, ISI, Kolkata**

Registration: 9:00 - 10:00

Inauguration: 09:45 - 10:00

Sankar K. Pal

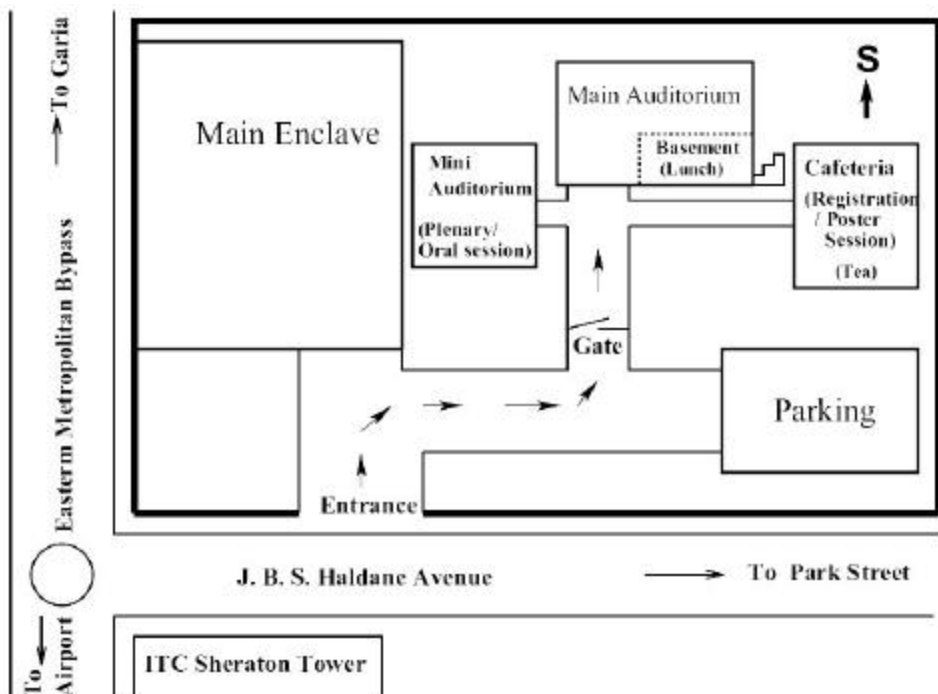
**Tutorial Session**

<b>Wednesday, December 15, 2004</b>	
<b>Venue: Geology Auditorium, ISI, Kolkata</b>	
<b>Tutorial-I</b>	<b>10:00 - 11:30</b>
Andrew Zisserman, University of Oxford, UK <i>Trainable Visual Models for Object Class Recognition</i>	

<b>Tutorial-II</b>	<b>11:45 - 13:15</b>
Baba C. Vemuri, University of Florida, USA <i>Image Registration with Applications to Medical Imaging</i>	

<b>Tutorial-III</b>	<b>14:15 - 15:45</b>
Larry Davis, University of Maryland, USA <i>Detection and Tracking for Surveillance</i>	

<b>Tutorial-IV</b>	<b>16:00 - 17:30</b>
J. K. Aggarwal, University of Texas, Austin, USA <i>Human Motion: Actions and Interactions</i>	



**Science City: Schematic Map**

# Program Table of ICVGIP 2004

Date	09:00-11:00	9:30-10:30	10:30-11:00	11:00-11:40	11:40-13:00	13:00-14:00	14:00-15:30	15:15-15:30	15:30-16:10	16:10-18:10
Dec, 16, 2004	Registration	Inauguration	Tea	Plenary Session-I (P - 1)	Computer Vision (CV 1 - 4)	Lunch	Computer Vision-I (CV 1.1 -1.8)	Tea	Plenary Session-II (P - 2)	Image Processing (IP 1 - 6)
							Computer Graphics-I (CG 1.1 - 1.8)			

Date	09:30-11:00	10:45-11:00	11:00-11:40	11:40-13:00	13:00-14:00	14:00-15:30	15:15-15:30	15:30-16:10	16:10-17:30
Dec, 17, 2004	Computer Vision-II (CV 2.1 - 2.18)	Tea	Plenary Session-III (P - 3)	Computer Graphics (CG 1 - 4)	Lunch	Image Processing-I (IP 1.1 -1.18)	Tea	Plenary Session-IV (P - 4)	Industry Session (IN 1 - 4)

Date	09:30-11:00	10:45-11:00	11:00-11:40	11:40-13:00	13:00-14:00	14:00-15:30	15:15-15:30	15:30-17:30	17:30-18:10
Dec, 18, 2004	Image Processing-II (IP 2.1 - 2.18)	Tea	Plenary Session-V (P - 5)	Image Segmentation (IS 1 - 4)	Lunch	Image Processing-III (IP 3.1 - 3.18)	Tea	Biometrics and Related Application (BR 1 - 6)	Biometrics Valedictory Session & IUPRAI GB Meeting

## Conference Venue: Science City

DR. J. B. S. Haldane Avenue  
Salt Lake  
Kolkata 700046

## Paper Presentation Details

Audio Visual Equipment available includes PC/Laptop (with USB Port, CD-ROM) equipped with Windows O/S, MS Power Point, PDF viewer and LCD and Overhead Projector.

## Poster Size

During the poster presentation you are expected to explain your work orally to interested participants. For presentation only **one poster area** per accepted paper is allowed. The size of the **poster area** should be 38 inches x 44 inches (width x height). Poster should be legible from a distance (~ 5 feet) to permit viewing by more than one person at a time. There are poster boards available for display and board pins to put up your posters. It is acceptable to pin smaller sheets (e.g., A4 size papers) together to tile the poster area. The header of your poster should state the title of the paper followed by the names of the authors and their affiliations.

All posters should be displayed in the pre-numbered locations at The Cafeteria Hall of the Science City. For example, if your poster paper number is CV1.12, then please put your poster on the location marked 12 (in the first poster session on computer vision CV1). The poster should be dismounted immediately after the poster session.

**Note:** *CG 1.1 – 1.8 posters are to be displayed in poster location 9 to 16, respectively.*

## Oral Presentation: Instruction for Speakers

- ◆ Time allotted for each **plenary** talk is 40 minutes. The speaker is requested to finish the presentation within 35 minutes leaving 5 minutes for open discussion.
- ◆ Time allotted for each **contributed** talk is 20 minutes. The speaker is requested to finish the presentation within 15 minutes leaving 5 minutes for open discussion. A warning bell will ring after 13 minutes, 15 minutes and finally after 20 minutes.

The speaker is requested to contact the chairperson of the respective session well in advance so that the session can be conducted efficiently.

## Instructions for Chairpersons

- ◆ Time allotted for each **plenary** talk is 40 minutes. The speaker should be requested to finish the presentation within 35 minutes leaving 5 minutes for open discussion.
- ◆ Time allotted for each **contributed** talk is 20 minutes. The speaker should be requested to finish the presentation within 15 minutes leaving 5 minutes for open discussion. A warning bell will ring after 13 minutes, 15 minutes and finally after 20 minutes.

- ◆ Please note that there is no specific time slot for pre and post session moderation, which is certainly very important. Please apply your judgment to adjust/monitor this so that overall time limit for the session could be maintained.
- ◆ Representative of the organizing committee will try to inform you about any change of schedule/non-availability of speakers for any particular session.
- ◆ In case of any difficulty the chairperson should communicate with any of the following persons:  
**B. Chanda and D. P. Mukherjee**  
The chairperson may seek assistance of registration desk for contacting these persons.

## Conference Session

<b>Plenary – I</b>	<b>Chair: L. S. Davis</b>
<b>Thursday, December 16, 2004</b>	<b>11:00—11:40</b>
<b>Venue:</b>	<b>Mini Auditorium</b>
Perception and Recognition of Faces – Human Capacities of Possible Relevance for Artificial Systems <i>Ken Nakayama, Harvard University, USA</i>	

## Oral Session

<b>Computer Vision</b>		<b>Chair: J. K. Aggarwal</b>
<b>Thursday, December 16, 2004</b>		<b>11:40—13:00</b>
<b>Venue:</b>		<b>Mini Auditorium</b>
CV1	Geometric Structure Computation from Conics <i>Pawan Kumar Mudigonda, C. V. Jawahar and P. J. Narayanan, India</i>	
CV2	A Framework for Activity Recognition and Detection of Unusual Activities <i>Dhruv Mahajan, Nipun Kwatra, Sumit Jain, Prem Kalra and Subhashis Banerjee, India</i>	
CV3	Activity Representation Using 3D Shape Models <i>Amit K. Roy-Chowdhury, Rama Chellappa and Umut Akdemir, USA</i>	
CV4	High-Resolution Multiscale Panoramic Mosaics from Pan-Tilt-Zoom Cameras <i>Sudipta N. Sinha, Marc Pollefeys and Seon Joo Kim, USA</i>	

## Poster Session

<b>Computer Vision – I</b>		<b>Chair: S. Das</b>
<b>Thursday, December 16, 2004</b>		<b>14:00—15:30</b>
<b>Venue:</b>		<b>Cafeteria</b>
CV1.1	Spatio-Temporal Grouping Models and Prominence Models in Perceptual Organization for Semantic Interpretation of Video Shot <i>Gaurav Harit and Santanu Chaudhury, India</i>	
CV1.2	Active 3-D Object Recognition Using Appearance-Based Aspect Graphs <i>Sumantra Dutta Roy and Nirupama Kulkarni, India</i>	
CV1.3	A Robust and Computationally Efficient Motion Detection Algorithm Based on $\hat{O}$ - $\hat{A}$ Background Estimation <i>A. Manzanera and J. C. Richefeu, France</i>	
CV1.4	Handling Occlusions in Monocular Surveillance Systems <i>Prithwijit Guha, Nisarg Vyas, Amitabha Mukerjee and K. S. Venkatesh, India</i>	
CV1.5	Estimating 3D Hand Position and Orientation Using Stereo <i>Afshin Sepehri, Yaser Yacoob and Larry S. Davis, USA</i>	
CV1.6	Modeling Signs Using Functional Data Analysis <i>Sunita Nayak, Sudeep Sarkar and Kuntal Sengupta, USA</i>	
CV1.7	IRIS Recognition Method Using Random Texture Analysis <i>Ali Ajdari Rad, Reza Safabakhsh and Navid Qaragozlou, Iran</i>	

CV1.8	Mathematical Morphology Based Corner Detection Scheme: A Non-Parametric approach <i>R. Dinesh and D. S. Guru, India</i>
-------	--

### Poster Session

<b>Computer Graphics – I</b>		<b>Chair: A. K. Das</b>
<b>Thursday, December 16, 2004</b>		<b>14:00—15:30</b>
<b>Venue:</b>		<b>Cafeteria</b>
CG1.1	A Proposed Glass-Painting Filter <i>Priti Sehgal and P. S. Grover, India</i>	
CG1.2	Encoding Quadrilateral Meshes in 2.40 bits per Vertex <i>Pawel Kosicki and Asish Mukhopadhyay, Canada</i>	
CG1.3	Stylistic Reuse of View-Dependent Animations <i>Parag Chaudhuri, Ashwani Jindal, Prem Kalra and Subhashis Banerjee, India</i>	
CG1.4	MoCap Based New Walk and Climb Synthesis <i>Shrinath Shanbhag and Sharat Chandran, India</i>	
CG1.5	Animation of Lip Motions and Facial Expressions using 3D Homeomorphic Models <i>Erdem Akagunduz and Ugur Halici, Turkey</i>	
CG1.6	Depth+Texture Representation for Image Based Rendering <i>P. J. Narayanan, Sashi Kumar P and Sireesh Reddy K, India</i>	
CG1.7	The Fast Multipole Method for Global Illumination <i>Alap Karapurkar, Nitin Goel and Sharat Chandran, India</i>	
CG1.8	Markerless Motion Capture from Monocular Videos <i>Vishal Mamania, Appu Shaji and Sharat Chandran, India</i>	

<b>Plenary – II</b>		<b>Chair: B. C. Vemuri</b>
<b>Thursday, December 16, 2004</b>		<b>15:30—16:10</b>
<b>Venue:</b>		<b>Mini Auditorium</b>
P2	Document Image Understanding and Digital Libraries <i>Henry S. Baird, Lehigh University, USA</i>	

### Oral Session

<b>Image Processing</b>		<b>Chair: S. K. Pal</b>
<b>Thursday, December 16, 2004</b>		<b>16:10—18:10</b>
<b>Venue:</b>		<b>Mini Auditorium</b>
IP1	Use of Linear Diffusion in Depth Estimation Based on Defocus Cue <i>Vinay P. Namboodiri and Subhasis Chaudhuri, India</i>	
IP2	PCA Based Generalized Interpolation for Image Super-Resolution <i>C. V. Jiji and Subhasis Chaudhuri, India</i>	
IP3	Design of A Robust Spread Spectrum Image Watermarking Scheme <i>Santi P. Maity, Malay K. Kundu and Tirtha S. Das, India</i>	
IP4	Multi Example Based Image Retrieval: An ICA Based Approach <i>Jayanta Basak, Koustav Bhattacharya and Santanu Chaudhury, India</i>	

IP5	Learning Layered Pictorial Structures from Video <i>M. Pawan Kumar, P. H. S. Torr and A. Zisserman, UK</i>
IP6	Robust Segmentation of Unconstrained Online Handwritten Documents <i>Anoop M. Namboodiri and Anil K. Jain, USA</i>

### Poster Session

<b>Computer Vision – II</b>		<b>Chair: J. K. Mukherjee</b>
<b>Friday, December 17, 2004</b>		<b>9:30—11:00</b>
<b>Venue</b>		<b>Cafeteria</b>
CV2.1	Fitting Coupled Geometric Objects for Metric Vision <i>Paul O'Leary, Matthew Harker and Paul Zsombor-Murray, Austria</i>	
CV2.2	Efficient Identification Based on Human Iris Patterns <i>A. Chitra and R. Bremananth, India</i>	
CV2.3	Multiple Model Based Point Targets Tracking Using Particle Filtering in InfraRed Image Sequence <i>Mukesh A. Zaveri, S. N. Merchant and Uday B. Desai, India</i>	
CV2.4	Study on Ultrasound Kidney Images Using Principal Component Analysis: A Preliminary Result <i>C. Karthikeyini, K. Bommana Raja and M. Madheswaran, India</i>	
CV2.5	Bidimensional Motion Charge Map for Stereovision Disparity Analysis <i>Jos'e M. L'opez-Valles and Miguel A. Fern'andez, Spain</i>	
CV2.6	Estimation of Depth Information from a Single View in an Image <i>S. Murali and N. Avinash, India</i>	
CV2.7	Object Identification and Colour Recognition for Human Blind <i>R. Nagarajan, G. Sainarayanan, Sazali Yaacob and Rosalyn R. Porle, Malaysia</i>	
CV2.8	Partial Shape Retrieval by M-tree and a Bayesian Approach <i>Said Mahmoudi and Mohamed Daoudi, France</i>	
CV2.9	Statistical Object Recognition for Multi-Object Scenes with Heterogeneous Background <i>Marcin Grzegorzec, Kailash N. Pasumarthy, Michael Reinhold and Heinrich Niemann, Germany</i>	
CV2.10	Moving Object Segmentation in Video Using Stationary Wavelet Transform <i>Debashis Sen, Ajit Singh Sandhu and Harun Prasad Paramasivam, Canada</i>	
CV2.11	Object Discrimination Using Stereo Vision for Blind through Stereo Sonification <i>G. Balakrishnan, G. Sainarayanan, R. Nagarajan and Sazali Yaacob, Malaysia</i>	
CV2.12	Probabilistic Measures for Motion Segmentation <i>Venu Madhav Govindu, India</i>	
CV2.13	Recognition of Partially Occluded Objects Using Btree Index Structure: An Efficient and Robust Approach <i>R. Dinesh and D.S. Guru, India</i>	
CV2.14	Hough Transform for Region Extraction in Color Images <i>Sarif Kumar Naik and C. A. Murthy, India</i>	
CV2.15	3D Reconstruction of Retinal Blood Vessels from Two Views <i>Martinez-Perez M. E. and Espinosa-Romero A., Mexico</i>	

CV2.16	A New Morphological 3D Shape Decomposition: Grayscale Interframe Interpolation Method <i>D. N. Vizireanu and R. M. Udrea, Romania</i>
CV2.17	EMoTracker: Eyes and Mouth Tracker Based on Energy Minimization Criterion <i>Shahrel A Suandi, Shuichi Enokida and Toshiaki Ejima, Japan</i>
CV2.18	On Learning Shapes from Shades <i>Subhajit Sanyal, Mayank Bansal, Subhashis Banerjee and Prem Kalra, India</i>

### Plenary Session

<b>Plenary – III</b>		<b>Chair: P. Anandan</b>
<b>Friday, December 17, 2004</b>		<b>11:00—11:40</b>
<b>Venue:</b>		<b>Mini Auditorium</b>
P3	Real Time, Real World, Distributed Vision <i>Peter J. Burt, Sarnoff Corporation, USA</i>	

### Oral Session

<b>Computer Graphics</b>		<b>Chair: B. N. Chatterjee</b>
<b>Friday, December 17, 2004</b>		<b>11:40—13:00</b>
<b>Venue:</b>		<b>Mini Auditorium</b>
CG1	View Synthesis of Scenes with Man-Made Objects Using Uncalibrated Cameras <i>Geetika Sharma, Santanu Chaudhury and J. B. Srivastava, India</i>	
CG2	Multi-Dimensional Transfer Function Design for Scientific Visualization <i>Sangmin Park and Chandrajit Bajaj, USA</i>	
CG3	Design of A Geometry Streaming System <i>Soumyajit Deb and P. J. Narayanan, India</i>	
CG4	Efficient Light Field Based Camera Walk <i>Aviral Pandey, Biswarup Choudhury and Sharat Chandran, India</i>	

### Poster Session

<b>Image Processing – I</b>		<b>Chair: P. J. Narayanan</b>
<b>Friday, December 17, 2004</b>		<b>14:00—15:30</b>
<b>Venue:</b>		<b>Cafeteria</b>
IP1.1	Content Based Image Retrieval in Presence of Foreground Disturbances <i>Rajashekhar and Subhasis Chaudhuri, India</i>	
IP1.2	Skew Estimation in Digitised Documents: A Novel Approach <i>D. S. Guru, P. Punitha and S. Mahesh, India</i>	
IP1.3	False Color Suppression in Demosaiced Color Images <i>Jayanta Mukherje, Manfred K. Lan and S.K.Mitra, USA</i>	
IP1.4	Algorithms and Hardware Implementation of Real Time Automatic Gain Control Feature for Thermal Imager <i>Himanshu Singh, Ajay Kumar and S. S. Negi, India</i>	
IP1.5	Content Based Retrieval of Emotions in Face Images <i>J. Nileema, Priti Chandra, C. Bhagvati, Arun K. Pujari and B. L. Deekshatulu, India</i>	
IP1.6	Multilevel Approach for Color Image Segmentation <i>Kanchan Deshmukh, Abhijeet Nandedkar, Yeshwant Joshi and Ganesh Shinde, India</i>	

IPI.7	Diagnostic Analysis Using Textural Features of the Lachrymal Fluid Crystals Images <i>N. Yu. Ilyasova, A. V. Kupriyanov, A. M. Malapheev and A. G. Khramov, Russia</i>
IPI.8	Contrast Enhancement of Electron Magnetic Resonance Images Using Linear and Non Linear Unsharp Masking Techniques <i>P. Alli, Murali C. Krishna and R. Murugesan, India</i>
IPI.9	Evaluation of Algebraic Iterative Algorithms for Reconstruction of Electron Magnetic Resonance Images <i>S. Sivakumar, Murali C. Krishna and R. Murugesan, India</i>
IPI.10	A New Algorithm for Image Reconstruction for Positron Emission Tomography <i>Partha P. Mondal and K. Rajan, India</i>
IPI.11	Wavelet Packet Based Digital Image Watermarking <i>A. Adhipathi Reddy and B. N. Chatterji, India</i>
IPI.12	Unsupervised Segmentation of Texture Images Using a Combination of Gabor and Wavelet Features <i>Shivani G. Rao, Manika Puri and Sukhendu Das, India</i>
IPI.13	Watermarking Scheme for Blind Quality Assessment in Multimedia Mobile Communication Services <i>Santi P. Maity, Malay K. Kundu and Prasanta K. Nandi, India</i>
IPI.14	Facial Model Improvement Using 3D Texture Mapping Feedback <i>Yongjie Liu, Anup Basu and Jong-Seong Kim, South Korea</i>
IPI.15	Region of Interest Based Coding of 2-D and 3-D Magnetic Resonance Images <i>R. Srikanth and A. G. Ramakrishnan, India</i>
IPI.16	Fractal Based Image Segmentation <i>Tushar Londhe, Asim Banerjee and Suman K. Mitra, India</i>
IPI.17	Content Based Image Retrieval with Multiresolution Salient Points <i>Minakshi Banerjee and Malay K. Kundu, India</i>
IPI.18	Image Retrieval Using Relevance Feedback Based on Mann-Whitney Test <i>Sanjoy K. Saha, Amit K. Das and Bhabatosh Chanda, India</i>

### Plenary Session

<b>Plenary – IV</b>		<b>Chair: A. Zisserman</b>
<b>Friday, December 17, 2004</b>		<b>15:30—16:10</b>
<b>Venue:</b>		<b>Mini Auditorium</b>
P.4	The Space of Human Shapes <i>Brian Curless, University of Washington, USA</i>	

### Oral Session

<b>Industry Presentation</b>		<b>Chair: N. Gupta and A. Bagchi</b>
<b>Friday, December 17, 2004</b>		<b>16:10—17:50</b>
<b>Venue:</b>		<b>Mini Auditorium</b>
IN.1	Adobe in the World of Imaging <i>Naveen Goel, Adobe Systems India</i>	
IN.2	HPTC (High Performance Computing) Strategy <i>K Jayan, HP (India)</i>	
IN.3	Real-time Vision at Siemens Corporate Research <i>Visvanathan Ramesh, Siemens Corporate</i>	

IN 4	Embedded implementation of H.264 video decoder <b>Arun K. Pradhan and Tanushyam Chattopadhyay, Embedded Software Solutions Group, TCS</b>
IN 5	Challenges of Fingerprints Based Analysis System in Civilian Applications: Role of CMC R&D <b>G. S. Raghu Raman, CMC</b>

<b>Banquet</b>	
<b>Friday, December 17, 2004</b>	<b>19:00</b>
<b>Venue:</b>	<b>Hotel Taj Bengal</b>
<b>Sitar recital by <i>Pandit Sugato Nag</i></b>	<b>19:00 - 20:00</b>
<b>Banquet Dinner</b>	<b>20:00 - 21:30</b>

### Poster Session

<b>Image Processing – II</b>		<b>Chair: P. Gupta</b>
<b>Saturday, December 18, 2004</b>		<b>9:30—11:00</b>
<b>Venue:</b>		<b>Cafeteria</b>
IP2.1	A Very Efficient Table Detection System from Document Images <b>S. Mandal, S. P. Chowdhury, A. K. Das and Bhabatosh Chanda, India</b>	
IP2.2	Similarity Retrieval of Symbolic Images with Multiple Instances of Iconic Objects: A Novel Approach <b>P. Punitha and D. S. Guru, India</b>	
IP2.3	Recognition of Unconstrained Malayalam Handwritten Numeral <b>U. Pal, S. Kundu, Y. Ali, H. Islam and N. Tripathy, India</b>	
IP2.4	Video Summarization: A Machine Learning Based Approach <b>Koustav Bhattacharya, Santanu Chaudhury and Jayanta Basak, India</b>	
IP2.5	A Color-Texture Histogram from the HSV Color Space for Video Shot Detection <b>A. Vadivel, M. Mohan, Shamik Sural and A. K. Majumdar, India</b>	
IP2.6	Some New Similarity Measures for Histograms <b>Dietrich Van der Weken, Mike Nachtegael and Etienne Kerre, Belgium</b>	
IP2.7	Improved Cut-Based Foreground Identification <b>Sharat Chandran, Satwik Hebbar, Vishal Maman and Abhineet Sawa, India</b>	
IP2.8	A Perceptual No-Reference Blockiness Metric for JPEG Images <b>R. Venkatesh Babu, Ajit S. Bopardikar and Andrew Perkis, Norway</b>	
IP2.9	Face Recognition Using Legendre Moments <b>S. Annadurai and A. Saradha, India</b>	
IP2.10	Recognition of Non-symmetric Faces Using Principal Component Analysis <b>N. Krishnan, G. Raja Jothi and G. Lakhs Aaron, India</b>	
IP2.11	G-Images: Towards Multilevel Unsupervised Image Segmentation <b>Harbir Singh and Reyer Zwiggelaar, UK</b>	
IP2.12	Curse Word Recognition Using a Novel Feature Extraction Method and a Neural Network <b>José Ruiz-Pinales and René Jaime-Rivas, Mexico</b>	
IP2.13	Lung Disease Detection Using Frequency Spectrum Analysis <b>Ching Ming Jimmy Wang, Mamatha Rudrapatna and Arcot Sowmya, Australia</b>	

IP2.14	A Comparative Study on Discrete Orthonormal Chebyshev Moments and Legendre Moments for Representation of Printed Characters <i>Sarat Saharia, Prabin K. Bora and Dilip K. Saikia, India</i>
IP2.15	Emotion Recognition from Facial Expressions: A Target Oriented Approach Using Neural Network <i>Sreevatsan A N, Sathish Kumar K G, Rakeshsharma S and Mohd. Mansoor Roomi, India</i>
IP2.16	Local Correlation-based Fingerprint Matching <i>Karthik Nandakumar and Anil K. Jain, USA</i>
IP2.17	CODE: An Adaptive Algorithm for Detecting Corners and Directions of Incident Edges <i>Partha Bhowmick and Bhargab B. Bhattacharya, India</i>
IP2.18	Transcoding of Document Images for Mobile Devices <i>Tabassum Yasmin, Santanu Chaudhury and Richa Jain, India</i>

### Plenary Session

<b>Plenary – V</b>		<b>Chair: B. L. Deekshatulu</b>
<b>Saturday, December 18, 2004</b>		<b>11:00—11:40</b>
<b>Venue:</b>		<b>Mini Auditorium</b>
P5	Digital Distance Geometry and its Applications to Image Analysis <i>Partha P. Das, Interra Systems, India</i>	

### Oral Session

<b>Image Segmentation</b>		<b>Chair: B. B. Chaudhuri</b>
<b>Saturday, December 18, 2004</b>		<b>11:40—13:00</b>
<b>Venue:</b>		<b>Mini Auditorium</b>
IS1	Information Content Driven Unsupervised Top-Down Image Segmentation <i>Emanuel Diamant, Israel</i>	
IS2	An Unsupervised Boosting Learning Algorithm for Finite Mixture Model-based Image Segmentation <i>Yu lin-Sen and Zhang Tian-Wen, China</i>	
IS3	A Novel Merging Method in Watershed Segmentation <i>Maria Frucci, Italy</i>	
IS4	Quantitative Comparison of Automatic ICV Segmentation Methods Using 3T MR Images <i>Suja S. and Rakesh Mullick, India</i>	

### Poster Session

<b>Image Processing – III</b>		<b>Chair: D. S. Guru</b>
<b>Saturday, December 18, 2004</b>		<b>14:00—15:30</b>
<b>Venue:</b>		<b>Cafeteria</b>
IP3.1	Sports Video Characterization Using Scene Dynamics <i>R. S. Jadon, Santanu Chaudhury and K. K. Biswas, India</i>	
IP3.2	Line Segmentation and Analysis with Special Interest to the Duct of a Line <i>Carola Schonlieb and Kung Chieh Wang, Austria</i>	
IP3.3	CONFERM: Connectivity Features with Randomized Masks and Their Applications to Image Indexing <i>Arindam Biswas, Partha Bhowmick and Bhargab B. Bhattacharya, India</i>	

IP3.4	A Modified BTC Using Quincunx Subsampling and Pattern Fitting for Very Low bpp <b>Bibhas Chandra Dhara and Bhabatosh Chanda, India</b>
IP3.5	Multi Biometric System for Verification with Minimum Training Data <b>Mayank Vatsa, Richa Singh and P. Gupta, India</b>
IP3.6	Bitplane Based Area Morphology for CBIR <b>K. Kiran Kumar, Chakravarthy Bhagvati, A. K. Pujari and B. L. Deekshatulu, India</b>
IP3.7	A System for Joining and Recognition of Broken Bangla Numerals for Indian Postal Automation <b>K. Roy, U. Pal and B. B. Chaudhuri, India</b>
IP3.8	Recognition of Modification-based Scripts Using Direction Tensors <b>Lalith Premaratne, Yaregal Assabie and Josef Bigun, Sweden</b>
IP3.9	Correcting Colours for Aided Recomposition of Fragments <b>G. Carlomagno, F. Renna, N. Ancona, N. Mosca, G. Attolico and A. Distante, Italy</b>
IP3.10	A Robust Nonparametric Estimation Framework for Implicit Image Models <b>Himanshu Arora, Maneesh Singh and Narendra Ahuja, USA</b>
IP3.11	Robust Fingerprint Classification Using an Eigen Block Directional Approach <b>P Madhusoodhanan and Sumantra Dutta Roy, India</b>
IP3.12	Minutiae Verification in Fingerprint Images Using Steerable Wedge Filters <b>Sharat Chikkerur, Venu Govindaraju, Sharath Pankanti and Ruud Bolle, India</b>
IP3.13	Recognition of Binary Image Represented by a String of Numbers <b>Kallol Bhattacharya, Krishnendu Goswami and Dipankar Biswas, India</b>
IP3.14	Searching in Document Images <b>C. V. Jawahar, Million Meshesha and A. Balasubramanian, India</b>
IP3.15	A Study on the Application of Color Transfer Technique for Video Compression <b>K. Madhu Sudhana Rao and Suman K. Mitra, India</b>
IP3.16	Hidden Markov Model Based Structuring of Cricket Video Sequences Using Motion and Color Features <b>M. H. Kolekar and S. Sengupta, India</b>
IP3.17	Key Video Object Plane Selection by MPEG-7 Visual Shape Descriptor for Summarization and Recognition of Hand Gestures <b>M. K. Bhuyan, D. Ghosh and P. K. Bora, India</b>
IP3.18	An Architecture for Real Time Face Recognition Using WMPCA <b>A. Pavan Kumar, V. Kamakoti and Sukhendu Das, India</b>

### Oral Session

<b>Biometrics and Related Application</b>		<b>Chair: D. Dutta Majumder</b>
<b>Saturday, December 18, 2004</b>		<b>15:30—17:30</b>
<b>Venue:</b>		<b>Mini Auditorium</b>
BR1	Fingerprint Classification Using Orientation Field Flow Curves <b>Sarat C. Dass and Anil K. Jain, USA</b>	
BR2	Multi-Cue Exemplar-Based Nonparametric Model for Gesture Recognition <b>Vinay D. Shet, V. Shiv Naga Prasad, Ahmed Elgammal, Yaser Yacoub and Larry S. Davis, USA</b>	
BR3	Towards a Robust and Real-time Face Detection and Tracking Framework <b>Peihua Li and Kai Xie, China</b>	
BR4	Robust Face Recognition by Fusion <b>K. Srinivasa Rao, Lilesh S. Ghadi, Y. Anoop Kumar and A. N. Rajagopalan, India</b>	

BR5	Dynamic Hand Gesture Recognition Using Predictive Eigen Tracker <i>Kaustubh S. Patwardhan and Sumantra Dutta Roy, India</i>
BR6	Fast and Robust Projective Matching for Fingerprints Using Geometric Hashing <i>Rintu Boro and Sumantra Dutta Roy, India</i>

<b>Valedictory Session</b>	
<b>Saturday, December 18, 2004</b>	<b>17:30—18:10</b>
IUPRAI GB Meeting	

## **Guest Houses, Hostels and Hotel for ICVGIP 2004 Participants**

### ***ISI Guest House***

205 B. T. Road  
Kolkata - 700108  
Phone: +91 033 25778597, 25778598

### ***Students' House/ Executive Hostel***

National Institute of Technical Teachers' Training and Research (NITTTR)  
(Earlier known as TTTL, Calcutta)  
FC Block, Sector-III, Salt Lake (Opposite of Laboni Housing Estate)  
Kolkata - 700 106,  
Phone: +91 33 2337-0479, 2337-4125

### ***The University Guest House*** (also know as Alumni Guest House)

Bengal Engineering and Science University, Sibpur  
(Formerly Bengal Engineering College)  
College Road, Sibpur  
Howrah 711 103  
Phone: +91 33 26682223

### ***Taj Bengal***

34-B, Belvedere Road,  
Alipore  
Kolkata-700 027  
Tel: +91 033 22233939  
Fax: +91 033 22311766, 22238805

## CALCUTTA

**On August 24, 1690, an Englishman on his travels, took a "mid-day halt". And since then, from the stopover of Job Charnock "grew a city..... so it spread.....chance directed, chance erected.....".**

Bustling with trade, shimmering with colours and jewels, it was till 1911 the capital of British India. The Indian renaissance started here and India's struggle for freedom was born here. Even today, Calcutta retains its splendour and glory. It is the nerve centre of cultural ferment and the home of many modern movements in art, cinema and theatre in India.

Calcutta, with its ten million people, is a fascinating city vibrating with life.

Calcutta is indescribable. Life never stops in Calcutta. At any time of the year there is something going on - a festival, a wedding, a match, a demonstration, a concert or a party. One has to live it, breathe it, love it and eventually when it is time to go, leave behind a bit of one's heart.

### **AIR CONNECTIONS**

Calcutta is internationally connected by air directly to New York, London, Paris, Frankfurt, Rome, Moscow, Dubai, Bangkok, Singapore, Tokyo and others.

Within India it is linked with Delhi, Mumbai, Chennai, Bangalore, Guwahati, Dibrugarh, Nagpur, Bhubaneswar, Hyderabad and other important cities.

### **PLACES TO VISIT**

#### **Academy of Fine Arts**

Established in 1933, the Academy is a place where the city's culturally conscious intellectuals converge. Its art galleries feature exhibitions by contemporary artists throughout the year. The Rabindra Gallery contains personal belongings, manuscripts and paintings by Tagore. Situated near Victoria Memorial, its galleries are open daily from 3 pm to 8 pm (except the Rabindra Gallery which remain open from 12:00 noon to 6 pm daily, closed on Mondays).

#### **Belur Math**

Founded by Swami Vivekananda, the world famous yogi and disciple of Sri Ramakrishna Paramhansa, it is the Headquarters of the Ramakrishna Mission. This International tourist attraction is located on the banks of the river Hooghly near Belur, 6.4 kms. from Howrah Station. Its sprawling prayer hall with a statue of Ramakrishna is remarkable. Connected by train and bus.

### **Birla Industrial & Technological Museum**

Established in 1959, it is located at 19A Gurusaday Road. It features permanent exhibition on scientific and technological progress. Has workshop which designs and produces much of its exhibits. Entry by ticket, Monday closed.

### **Birla Planetarium**

One of the largest in Asia, it is located at 96 Jawaharlal Nehru Road, Daily programmes in English, Bengali and Hindi from 12 noon to 7 pm. It can accommodate 500 persons. Entry by ticket, Monday closed.

### **Botanical Garden**

The largest and oldest of its kind in India, it was laid out in 1787. It covers an area of 109.27 ha and is famous for the over 250 years old Great Banyan tree which covers 382 m in its circumference, with over 600 aerial roots. There are more than 30,000 varieties of trees and plants. Situated about 9 km from Calcutta, across the Hooghly river, it is a lovely picnic spot, best reached by a ferry across the Hooghly river from Metiabruz. Open from 7:00 am to 5:00 pm. Entry by ticket.

### **Dakshineswar**

Built by Rani Rasmoni in the 19<sup>th</sup> century on the bank of the river Hooghly, in the northern suburb of Calcutta. It is here that Sri Ramakrishna Paramhansa, the renowned spiritual personality and the guru of Swami Vivekananda had worshipped the goddess Kali. A world famous place of pilgrimage.

### **Eden Gardens**

A sprawling garden set up by the British in the early 20<sup>th</sup> century with a band stand and a beautiful pagoda. An attractive picnic spot on Strand Road. A stadium has been built adjacent to it for cricket test matches which can accommodate about 100,000 people.

### **Indian Museum**

A National Museum housing rare antiques, armaments, armour, fossils, stones, paintings of Mughal India, regal dresses/uniforms, rare animal skeletons, mummies, etc. Entry by ticket. Situated on J L Nehru Road.

### **Kalighat Temple**

Legend goes that the name of Calcutta, is derived from the famous Kali deity of this temple located at Kalighat in South Calcutta. A great attraction for Hindu pilgrimage.

### **Metro Rail**

The underground railway system is the main traffic artery of the city, running from Dum Dum in the North to Tollygunge in the South. Stations are placed at all major junctions along the length of the city.

### **National Library**

Previously vice-Regal House, it is one of the largest libraries in Asia with a collection of rare books and manuscripts. Located opposite the Zoological Gardens, Alipore.

### **Nicco Park**

An amusement park with a variety of enjoyable games and rides. Located at Salt Lake. Entry by ticket.

### **Saheed Minar**

Previously known as Ochterloney Monument, it resembles the Qutab Minar of Delhi. Located near Esplanade on the Maidan and seat of many memorable political meetings.

### **St. Paul's Cathedral**

The Anglican Cathedral of Calcutta built in 1847, adjacent to the Birla Planetarium. Its tower is 65 m high and is famous for the serene service conducted on Christmas Eve.

### **Science City**

One of the few such facilities in the World, the Science City on the Eastern Metropolitan Bypass has a Convention Center and Science Theme Park. Here, hitech combines with impressive visuals to bring science closer to people. Entry by ticket.

### **Victoria Memorial**

Built in memory of Queen Victoria, between 1906 and 1921, imitating the Taj Mahal, topped with an angel, this memorial faces the Calcutta maidan. It houses paintings, manuscripts, and other objects of historic value in its Museum and Art

Gallery. Two regular sound and light shows are held in the evening. Entry by ticket, Monday closed.

### **Zoological Garden**

One of the biggest zoological gardens in India, it has a vast collection of animals, birds, snakes and reptiles. It also has a section for children. It remains a favourite picnic spot during winter and attracts a large number of emigrant birds. Directly across the main zoo is an aquarium, with a variety of aquatic life from around the world. Entry by ticket.

### **ESSENTIAL INFORMATION**

#### **Hospitals Nursing Homes**

Advanced Medicare & Research Institute Ltd. : 440-4102/9753/54

Assembly of god Hospital & Research Centre : 229-4853/4886

Belle Vue Clinic : Ambulance with medical facilities including oxygen, 24-hr doctor/nurse available : 247-7473/6925/7920/7918/6921

B. M. Birla Heart Research Centre : 456-7900/7100/7705/7102-5

CMRI : 456-7700/02/03/04, Fax : 456-7880

Calcutta Medical College : 241-49012-4/3953/3177/2962

Kothari Medical Centre : 456-7051/7055/7059

Lansdown Nursing Home : ideal place with life saving equipment: 217-1001 to 04, Tel./Fax : 217-7860

Peerless Hospital : 462-0955/0766/6394/2394/2462

SSKM Hospital : 223-9692

Woodlands Nursing Home : 456-7079/7080

#### ***Ambulance & Other Medical Services***

East West Medical Complex : Ambulance Services : 476-2252/2280

Happy Calcuttans : Ambulance available with oxygen and emergency drugs : 440-0160

Life Aid : Ambulance available : 473-5807/417-1845

Lokenath Divine Society of India : 24-hour hours service : 479-3301

Nightangle Ambulance Service : 475-4169

Meera Seva Kendra : Ambulance, Oxyge, Medical care, nurse available : 411-9400/0968/8316

Medicare Services : 247-6111 to 12, 247-6223

St. John Ambulance Association : 24-hour ambulance with oxygen Sealdah : 350-4199

## ***Trains / Flights***

Howrah Station (inquiry) : 660-2581/3542/7412

Fairlie Place (inquiry) : 220-4025

Reservation : Manual : 135 (05 lines) Computerised : 136 (Eng) 137 (Hindi) 138 (Bengali)

Howrah (New Complex) : 660-2217

Train information : Central Enquiry Manual : 1310, Recorded : 1331

Sealdah Station (inquiry) : 350-3537/3535

Public Information Centres/Sealdah : 3503536

Air India : 282-2356-59/282-1187 Airport : 511-9031

Indian Airlines : 236-4433 (24 hours)/236-0810/0730 Reservations : 141, 236-6869 (1900 to 0900 hrs)

Royal Brunei Airlines : 229-7112/7105/9577/2014 Airport : 511-8685, 511-8787 extn. : 4309

Sahara India Airlines : 282-7685 (City Office) Airport : 511-8357/8442

Singapore Airlines : Reservations/Ticketing : 280-9898/8882/8883, Airport : 511-9179/8978

British Airways: 288-3451/32/53/54, 288-9161/62 (City Office)

Airport: 511-8262/8424

Bangladesh Biman: 229-2844 Airport: 511-8787 extn.: 4207

Druk Air: 280-5376, 240-2419, Airport: 511-9894/9895 Telecheck in 511-8836

## **ICVGIP Bus Service (Location & Time)**

<b>Source Station</b>	<b>Destination</b>	<b>Departure from source at:</b>
Taj Bengal	Science City	08:00 AM
ISI Guest House	Science City	08:00 AM
NITTTR	Science City	08:15 AM
Science City	Taj Bengal	06:15 PM
Science City	ISI Guest House	06:15 PM
Science City	NITTTR	06:15 PM

**\*\*\* On December 17, 2004 all of these three buses will go to Taj Bengal for Banquet Dinner from Science City at 05:45 PM and all of these Buses will left Hotel Taj Bengal to it's destination at 09:45 PM \*\*\***