PREMI'07

Second International Conference on

Pattern Recognition and Machine Intelligence

December 18 – 22, 2007

Program Brochure

Machine Intelligence Unit
Indian Statistical Institute
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About the Conference

The primary goal of the conference is to present state-of-the-art scientific results, encourage academic and industrial interaction, and promote collaborative research and developmental activities in Pattern Recognition, Machine Intelligence and related fields, involving scientists, engineers, professionals, researchers and students from India and abroad. The conference is scheduled to be held every two years to make it an ideal platform for researchers to share their views, and experiences in the said areas. Particular emphasis of PReMI'07 is placed on data mining, soft computing, bioinformatics, biometrics, video and image analysis as well as various upcoming pattern recognition/image processing problems. There are tutorials, plenary talk, keynote talks and invited talks, delivered by speakers of international repute from both academia and industry.

About Machine Intelligence Unit (MIU)

The objective of the Machine Intelligence Unit (MIU) is to carry out basic research concerning certain aspects of machine intelligence and soft computing. This signifies the work associated with attempting to make a machine behave like a human being. In other words, it conveys the core concept of pattern recognition and machine learning with the advanced technologies like fuzzy logic, artificial neural networks, evolutionary computation, particle swarm optimization and rough sets, collectively called the soft computing paradigm. They provide techniques for flexible information processing, to deal with real life ambiguous situations in an efficient manner like human beings, and therefore form the basis of future generation computing systems. The investigation that is currently being done in MIU comprises both developing these technologies individually and in an integrated manner, and demonstrating their effectiveness in solving various problems of pattern recognition, machine learning, image and video processing, biometrics, data mining, bio-informatics etc. related to the design of intelligent systems.

About Indian Statistical Institute (ISI)

Founded by late Prof. P C Mahalanobis in December 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, Economics, Quality, Reliability, Operations Research, 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. 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 specialized areas like Pattern Recognition, Image Processing, Computer Vision, Data Mining, Soft Computing and Artificial Intelligence among others.

The platinum jubilee celebration of ISI was started in December 2006. Several events like conferences, schools, visionary lectures are being organized in this regard in different centres of ISI to commemorate this significant landmarks. This conference achives special significance since it coincides with the platinum jubilee celebrations.

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P Siarry
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Sriparna Saha
S Shevade
T Nagabhushan
U Bhattacharyya
U Chakraborty
U Garain
U Pal
Y Hayashi

Venue of the Conference

The Kolkata campus of the Indian Statistical Institute is located in a sprawling 30-acre estate on the Barrackpore Trunk Road (B T Road) in the Baranagore suburb of Greater Kolkata. It consists of two approximately equal parts - the office complex and the residential complex, - separated by a public road. This road (Girish Chand Ghosh Street) connects B T Road with Gopal Lal Tagore Road, a road that runs along the western boundary of the main campus. The office complex bears door numbers 202, 203 and 204, and the residential complex, 205 and 206. There is a subway connecting the two parts of the campus - residential and office complexes; to move between the residential and office complexes.

The principal buildings in the office complex are the R A Fisher Bhavan (RAFB), the Pamela Robinson Bhavan (PRB), the A N Kolmogorov Bhavan (ANKB), the Satyendra Nath Bose Bhavan (SNBB), the P N Haksar Bhavan (PNHB), the Rani Kuthi (Canteen) and the Amrapali. The residential campus at 205 and 206 B. T. Road premises includes, apart from several staff quarters, the Guest House, the Medical Welfare Unit, the Boys' Hostel, the M Tech hostel, the Research Scholars' and ISEC hostel, the Ladies hostel.

Registration Desk: CSCR Meeting Room: R A Fisher Bhavan (1st Floor)

Inauguration, Plenary and Keynote Talks, and Valedictory Session:

PRB Auditorium: Pamela Robinson Bhavan (2nd Floor)

Tutorial: ANKB Seminar Hall 1: A N Kolmogorov Bhavan (Ground Floor)

Invited Talks and Conference Sessions:

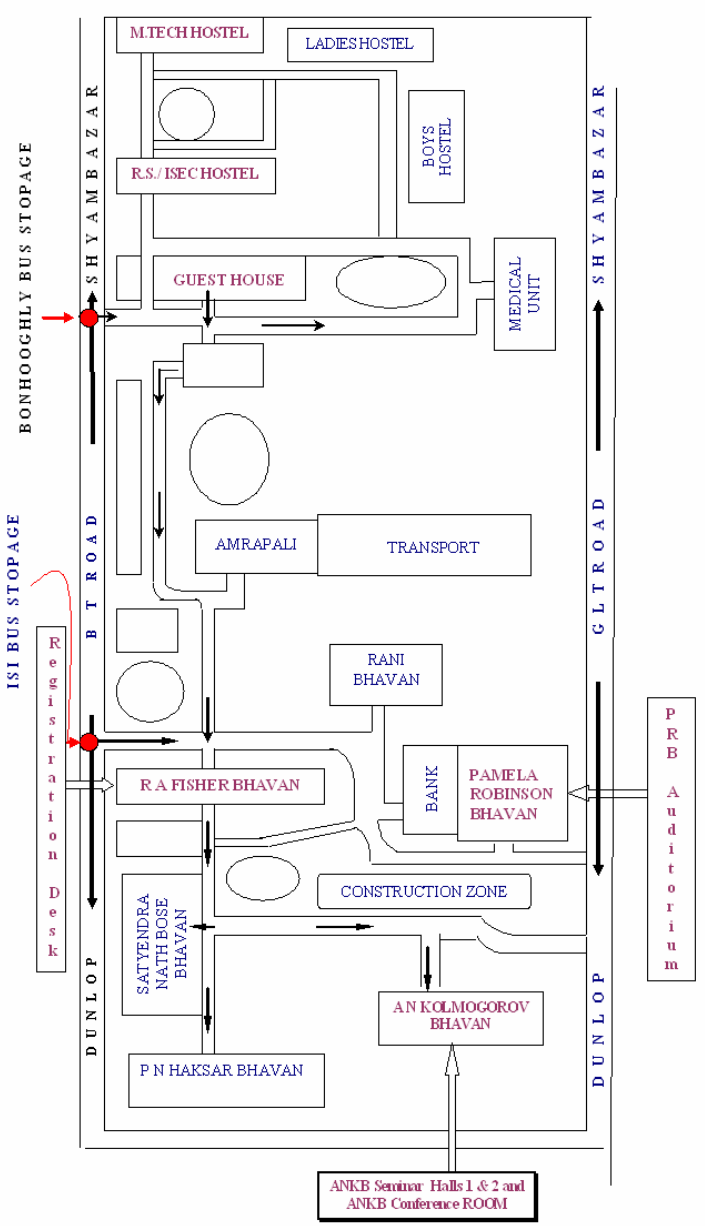
* ANKB Seminar Hall 1: A N Kolmogorov Bhavan (Ground Floor)
* ANKB Seminar Hall 2: A N Kolmogorov Bhavan (Ground Floor)
* ANKB Conference Room: A N Kolmogorov Bhavan (2nd Floor)

Poster Sessions: ANKB Conf Room Lounge: A N Kolmogorov Bhavan (2nd Floor)

Conference Lunch: ISI Guest House

Email: Laboratory-3 of Machine Intelligence Unit: R A Fisher Bhavan (1st Floor)

Accommodation: ISI Guest House, ISEC Hostel, R S Hostel and M Tech Hostel



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.

Instructions for Speakers:

- Time allotted for **plenary and each keynote** talk is 60 minutes.
- Time allotted for each **invited** talk is 45 minutes.
- Time allotted for each **contributed** talk is 20 minutes.

Instructions for Chairpersons:

- Please request the speakers to finish their presentation 5 minutes before the allotted time.
- 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 the volunteers present in the room. The chairperson may seek assistance of the registration desk for contacting organizing committee members.

Guidelines for Poster Sessions:

- 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.
- Maximum size of a **poster area** is **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 name of the author(s) with affiliations.
- All posters should be displayed in the pre-numbered locations at the site for poster presentations.

PROGRAM DETAILS: AT A GLANCE

Tutorials

Venue: ANKB Seminar Hall 1

18 December 2007

08:30 – 09:45	**TUTORIAL REGISTRATION** *(CSCR Meeting Room)*
10:00 – 13:00	**Speaker: Gabriella Pasi** University of Milan, Italy **Topic:** *Discovery of Process Models from Data and Domain Knowledge:A Rough-granular Approach*
13:00 – 14:00	**LUNCH BREAK** *(ISI Guest House)*
14:00 – 17:00	**Speaker: Dominik Slezak** Infobright Inc., Canada **Topic:** *Rough Sets in Data Mining and Data Warehousing*

19 December 2007

10:00 – 13:00	**Speaker: Meghana J Deodhar** The University of Texas at Austin, USA **Topic:** *Simultaneous Segmentation and Modeling of Complex Data*
13:00 – 14:00	**LUNCH BREAK** *(ISI Guest House)*
14:00 – 17:00	**Speaker: Nasser M Nasrabadi** Naval Research Laboratory, USA **Topic:** *Hyperspectral Image Processing*

PROGRAM DETAILS: AT A GLANCE

20 December 2007

08:30 – 9:45	**REGISTRATION** *(CSCR Meeting Room)*
10:00 – 10:45	**INAUGURATION** *(PRB Auditorium)*
10:45 – 11:30	**HIGH TEA**
11:30 – 12:30	**Plenary Talk** *(PRB Auditorium)* **Speaker: S Mitra** **Chair: S K Pal** **Title:** *Recent Research Results in Image and Video Processing*
12:30 – 13:15	**Invited Talk I** *(PRB Auditorium)* **Speaker: M Nachtegeal** **Chair: V D Gesu** **Title:** *The Possibilities of Fuzzy Logic in Image Processing* **Invited Talk II** *(ANKB Seminar Hall 1)* **Speaker: S B Cho** **Chair: N Zhong** **Title:** *Ensemble Approaches of Support Vector Machines for Multi-class Classification*
13:15 – 14:30	**LUNCH BREAK** *(ISI Guest House)*
14:30 – 16:10	**Session I: *Pattern Recognition*** *(ANKB Seminar Hall 1)* **Session II: *Biometrics*** *(ANKB Conference Room)*
16:10 – 16:25	**TEA BREAK**
16:25 – 17:25	**Keynote Talk I** *(PRB Auditorium)* **Speaker: N Zhong** **Chair: G Pasi** **Title:** *Towards Human Level Web Intelligence: A Brain Informatics Perspective*
17:25 – 18:25	**POSTER SESSION–I** *(Conference Room Lounge)*
19:00 Onwards	**WELCOME DINNER** *(ISI Guest House)*

PROGRAM DETAILS: AT A GLANCE

21 December 2007

09:30 – 10:15	**Invited Talk III** *(ANKB Seminar Hall 1)* **Speaker: L Bruzzone** **Chair: N M Nasrabadi** **Title:** *A Multi-scale Change Detection Technique Robust to Registration Noise* **Invited Talk IV** *(ANKB Conference Room)* **Speaker: G Wang** **Chair: Simon C K Shiu** **Title:** *Quick Knowledge Reduction Based on Divide and Conquer Method in Huge Data*
10:15 – 10:30	**TEA BREAK**
10:30 – 11:15	**Invited Talk V** *(ANKB Seminar Hall 1)* **Speaker: B C Lovell** **Chair: L Buzzone** **Title:** *Intelligent Surveillance and Pose-invariant 2D Face Classification* **Invited Talk VI** *(ANKB Conference Room)* **Speaker: Vito Di Gesu** **Chair: P P Majumder** **Title:** *Data Analysis and Bioinformatics*
11:15 – 12:35	**Session III: *Image Analysis–I*** ***(ANKB Seminar Hall 1)*** **Session IV: *Document Analysis–I*** ***(ANKB Conference Room)***
12:35 – 13:50	**LUNCH BREAK** *(ISI Guest House)*
13:50 – 14:50	**Industry Presentation** *(ANKB Conference Room)*
14:50 – 15:05	**TEA BREAK**
15:05 – 16:45	**Session V: *Image Analysis–II*** ***(ANKB Seminar Hall 1)*** **Session VI: *Data Mining*** ***(ANKB Conference Room)*** **Session VII: *Soft Computing & Appls.–I*** *(ANKB Seminar Hall 2)*
19:00 onwards	**BANQUET** including **CULTURAL PROGRAM** *(Royal Bengal Hall, City Center, Salt LakeCity)*

PROGRAM DETAILS: AT A GLANCE

22 December 2007

10:00 – 11:00	**Keynote Talk II** *(PRB Auditorium)* **Speaker: N M Nasrabadi** **Chair: C A Murthy** **Title:** *Kernel-based Spectral Matched Signal Detectors for Hyperspectral Target Detections*
11:00 – 11:15	**TEA BREAK**
11:15 – 12:15	**POSTER SESSION–II** *(Conference Room Lounge)*
12:15 – 13:00	**Invited Talk VII** *(ANKB Conference Room)* **Speaker: A Tepavcevic** **Chair: D Dutta Majumder** **Title:** *Representation of Families of Subsets by Lattice Valued Fuzzy Sets*
13:00 – 14:15	**LUNCH BREAK** *(ISI Guest House)*
14:15 – 15:55	**Session VIII: *Bioinformatics*** *(ANKB Seminar Hall 1)*
	Session IX: *Video Analysis* *(ANKB Conference Room)*
	Session X: *Signal & Speech Processing* *(ANKB Seminar Hall 2)*
15:55 – 16:10	**TEA BREAK**
16:10 – 17:50	**Session XI: *Document Analysis-II*** *(ANKB Seminar Hall 1)*
	Session XII: *Soft Computing Appls.-II* *(ANKB Conference Room)*
18:00 – 19:00	**VALEDICTORY SESSION**

23 December 2007

08:00 – 17:00	**SIGHT SEEING** **(Kolkata on Boat)**

CONFERENCE SESSIONS

Session I: Pattern Recognition		
20 December 2007	**Venue: *ANKB Seminar Hall 1***	**14:30 – 16:10**
Session Chair: S B Cho		
1.	*Robust Approach for Estimating Probabilities in Naive-Bayes Classifier* B Chandra, M Gupta and M P Gupta	
2.	*Weighted k-nearest Leader Classifier for Large Data* V Suresh Babu	
3.	*Hybrid Approaches for Clustering* L Kankanala and M Narasimha Murty	
4.	*Recognizing Patterns of Dynamic Behaviors Based on Multiple Relations in Soccer Robotics Domain* H Ayanegui and Femando Ramos	
5.	*Fault Diagnosis using Dynamic Time Warping* Rajshekhar, A Gupta, B D Kulkarni, V K Jayaraman and A N Samanta	

Session II: Biometrics		
20 December 2007	**Venue: *ANKB Conference Room***	**14:30 – 16:10**
Session Chair: M Natchgael		
1.	*Mixture of Laplacian Faces and Its Application to Face Recognition* S Noushath, A Rao and G Hemantha Kumar	
2.	*Age Transformation for Improving Face Recognition Performance* R Singh, M Vatsa, A Noore and S K Singh	
3.	*Recognizing Facial Expression using Particle Filter Based Feature Tracker* R Tripathi and R Aravind	
4.	*Human Gait Recognition using Temporal Slices* S Srivastava and S Sural	
5.	*Accurate Iris Boundary Detection in Iris Based Biometric Authentication Process* S Dey and D Samanta	

Poster Session - I		
20 December 2007	Venue: *ANKB Confe Room* Lounge.	**17:10 – 18:10**
1.	*FEM 2D Analysis of Mild Traumatic Brain Injury on a Child* Ernesto Ponce and Daniel Ponce	
2.	*Automatic Guidance of a Tractor using Computer Vision* Jaime Gomez Gil	
3.	*Entropy Based Skew Correction of Document Images* Arvind K R, Jayanth and A G Ramakrishnan	
4.	*Segmentation Multiple Textured Objects using Geodesic Active Contour and DWT* Surya Prakash and Sukhendu Das	
5.	*Improved Tracking of Multiple Vehicles using Invariant Feature-based Matching* Jae-Young Choi, Hyoung-Jong Jang and Young-Kyu Yang Jychoi	
6.	*Multiscale Boundary Identification for Medical Images* Zu Ying Wang, Zoltan Koles and Mrinal Mandal	
7.	*Modified 9DLT Matrix for Similarity Retrieval of Line Drawing Images* Naveen Onkarappa and D S Guru	
8.	*Neuromorphic Adaptable Ocular Dominance Maps* Priti Gupta, Mukti Bansal and C M Markan	
9.	*Computationally Efficient MCTF for MC-EZBC Scalable Video Coding Framework* Karunakar A Kotegar and Manohara Pai M M	
10.	*Automatic Detection of Human Fall in Video* Vinay Viswakarma, C R Mandal and Shamik Sural	

Session III: Image Analysis–I		
21 December 2007	Venue: *ANKB Seminar Hall 1*	**11:15 – 12:35**
Session Chair: B Lovell		
1.	*Spatial Topology of Equitemporal Points on signatures for Retrieval* H N Prakash, D S Guru and T N Vikram	
2.	*Image Retrieval using Fuzzy Relevance Feedback and Validation with MPEG-7 Content Descriptors* M Banerjee and M K Kundu	
3.	*Recognition of Isolated Handwritten Kannada Numerals Based on Image Fusion Approach* G G Rajaput and Mallikarjun	
4.	*Semi-supervised Learning with Multilayer Perceptron for Detecting Changes of Remote Sensing Images* S Patra, S Ghosh and A Ghosh	

Session IV: Document Analysis – I		
21 December 2007	Venue: *ANKB Conference Room*	**11:15 – 12:35**
Session Chair: M K Kundu		
1.	*Keywords Extraction from a Document using Centrality Measures* Girish Keshav Palshikar	
2.	*A HMM-Based Approach to Recognize Ultra Low Resolution Anti-Aliased Words* Farshideh Einsele, Jean Hennebert and Rolf Ingold	
3.	*Text Region Extraction from Quality Degraded Document Images* *S Abirami and D Manjula*	
4.	*Offline Handwritten Devanagari Word Recognition: An HMM Based Approach* S K Parui and Bikash Shaw	

Session V: Image Analysis – II		
21 December 2007	Venue: *ANKB Seminar Hall 1*	**15:05 – 16:25**
Session Chair: B Chanda		
1.	*Image Quality Assessment Based on Perceptual Structural Similarity* D Venkata Rao and L Pratap Reddy	
2.	*Topology Adaptive Active Membrane* Sitansu Kumar Das and Dipti Prasad Mukherjee	
3.	*Bit Plane Encoding and Encryption* Anil Yekkala and C EVeni Madhavan	
4.	*Projection Onto Convex Sets with Watermarking for Error Concealment* Chinmay Kumar Nayak, M S N Merchant, Jayalakshmi and U B Desai	

Session VI: Data Mining		
21 December 2007	Venue: *ANKB Conference Room*	**15:05 – 16:45**
Session Chair: S B Cho		
1.	*Efficient Multi-method Rule Learning for Pattern Classification, Machine Learning and Data Mining* Chinnmay Maiti and Somenath Pal	
2.	*High Confidence Association Mining without Support Pruning* Ramkishore Bhattacharyya and Balaram Bhattacharyya	
3.	*Automatic Reference Tracking With On-Demand Relevance Filtering based on User's Interest* G S Mahalakshmi, Sendhilkumar Selvaraju and P Karthik	
4.	*Personalized Web Search Based on a Search Flow Graph* S Sendhilkumar and T V Geetha	
5.	*Semantic Integration of Information Through Relation Mining -Application to Bio-Medical Text Processing* Lipika Dey, Muhammad Abulaish, Rohit Goyal and Jahiruddin	

Session VII: Soft Computing & Applications – I		
21 December 2007	Venue: *ANKB Seminar Hall I*	**15:05 – 16:45**
Session Chair: M. K. Chakraborty		
1.	*A Practical Fuzzy Logic Controller for Sumo Robot Competition* Hamit Erdem	
2.	*Hierarchical Fuzzy Case Based Reasoning With Multi-Criteria Decision Making for Financial Applications* Shanu Sushmita and Santanu Chaudhury	
3.	*Rough Set Theory of Pattern Classification in the Brain* Andrzej W Przybyszewski	
4.	*Rough Core Vector Clustering* S Verma, S Asharaf and M Narasimha Murthy	
5.	*A Decomposition Approach for Combined Heuristic and Differential Evolution Method for the Reactive Power Problem* Biplab Bhattacharyya and S. K. Goswami	

Poster Session - II

22 December 2007	Venue: *ANKB Conf. Room* Lounge	11:15-12:15

1.	*New Results on Energy Balance Analysis of Metabolic Networks* Qinghua Zhou, Simon C K Shiu, Sankar K Pal and Yan Li
2.	*An Adaptive Algorithm for Failure Recovery During Dynamic Service Composition* Xingzhi Feng
3.	*A GA-Based Pruning Strategy and Weight Update Algorithm for Efficient Nonlinear System Identification* G Panda, B Majhi, D Mohanty and A KSahoo
4.	*Prefix-Suffix Trees: a Novel Scheme for Compact Representation of Large Datasets* Radhika M Pai and V S Ananthanarayana
5.	*An Unbalanced Data Classification Model Using Hybrid Sampling Technique For Fraud Detection* T M Padmaja, N Dhulipalla, R R Krishna, B Raju and A Laha
6.	*Enhanced Quantum Evolutionary Algorithms for Difficult Knapsack Problems* C Patvardhan, Apurva Narain and A Srivastav
7.	*Language Independent Skew Estimation Technique Based on Gaussian Mixture Models: A Case Study on South Indian Scripts* Manjunath Aradhya VN, Ashok Rao and Hemantha Kumar G
8.	*Comparison of Neural Network Boolean Factor Analysis Method with Some Other Dimension Reduction Methods on Bars Problem* Dusan Husek, Pavel Moravec, Vaclav Snasel, Alexander Frolov, Hana Rezankova and Pavel

Session VIII: Bioinformatics

22 December 2007	Venue: *ANKB Seminar Hall 1*	14:15 – 15:55

Session Chair:

1.	*Discovering Patterns of DNA Methylation: Rule Mining with Rough Sets and Decision Trees, and Comethylation Analysis* Niu Ben, Simon C K Shiu and Sankar K Pal
2.	*Parallel Construction of Conflict Graph for Phylogenetic Network Problem* Prasanta Kumar Jana
3.	*Granular Support Vector Machine based Method for Prediction of Solubility of Proteins on Overexpression in Escherichia Coli* Pankaj Kumar, V K Jayaraman and B D Kulkarni
4.	*Evolutionary Biclustering with Correlation for Gene Interaction Networks* Ranajit Das, Sushmita Mitra, Haider Banka and Subhasis Mukhopadhyay
5.	*Identification of Gene Regulatory Pathways: A Regularization Method* Mouli Das, Rajat K De and Subhasis Mukhopadhyay

Session IX: Video Analysis

22 December 2007	Venue: *ANKB Conference Room*	14:15 – 15:55

Session Chair: S Chowdhury

1.	*Confidence Measure for Temporal Registration of Recurrent Non-uniform Samples* Meghna Singh, Mrinal Mandal and Anup Basu
2.	*Deformable Object Tracking: a Kernel Density Estimation Approach via Level Set Function Evolution* Niranjan Ray and Baidya Nath Saha
3.	*Spatio-temporal Descriptor using 3D Curvature Scale Space* A Dyana and Sukhendu Das
4.	*Shot Boundary Detection using Frame Transition Parameters and Edge Strength Scatter* Partha Pratim Mohanta, Sanjoy Kumar Saha and B Chanda
5.	*An Adaptive Bayesian Technique for Tracking Multiple Objects* Pankaj Kumar, Michael J Brooks and Anton van den Hengel

Session X: Signal and Speech Processing		
22 December 2007	Venue: *ANKB Seminar Hall 2*	**14:15 – 15:55**
Session Chair: B P Sinha		
1.	*Computation of QRS Vector of ECG Signal for Observation of it's Clinical Significance* Sucharita Mitra, M Mitra and B B Chaudhuri	
2.	*Signal Resampling Technique Combining Level Crossing and Auditory Features* Nagesha B K and Hemantha Kumar G	
3.	*Cepstral Domain Teager Energy for Identifying Perceptually Similar Languages* Hemant A Patil and T K Basu	
4.	*Spoken Language Identification for Indian Languages using Split and Merge EM Algorithm* *Suman K Mitra, M V Joshi and Naresh Manwani*	
5.	*Audio Visual Speaker Identity Verification Based on Cross Modal Fusion* Girja Chetty and Michael Wagner	
6.	*Voice Transformation by Mapping the Features at Syllable Level* K Sreenivasa Rao, R H Laskar and Shashidhar G Koolagudi	

SessionXI: Document Analysis – II		
22 December 2007	Venue: *ANKB Seminar Hall 1*	**16:10 – 17:50**
Session Chair: B B Chaudhuri		
1.	*HMM Parameter Estimation with Genetic Algorithm for Handwritten Word Recognition* Tapan Kumar Bhowmik, Swapan Kumar Parui, Manika Kar and Utpal Roy	
2.	*A Hidden Markov Model Based Bengali Named Entity Recognition System* Asif Ekbal and Sivaji Bandyopadhyay	
3.	*Detecting Misspelled Words in Turkish Text Using Syllable n-gram Frequencies* Rýfat A¸slýyan, Korhan G¨unel and Tatyana Yakhno	
4.	*Self Adaptable Recognizer for Document Image Collections* C V Jawahar and Million Meshesha	

Session XII: Soft Computing and Applications – II		
22 December 2007	Venue: *ANKB Conference Room*	**16:10 – 17:50**
Session Chair: A Tepavcevic		
1.	*Fuzzy Ordering Relation and Fuzzy Poset* Branimir Seselja and Andreja Tepavcevic	
2.	*Cunning Ant System for Quadratic Assignment Problem with Local Search and Parallelization* S. Tsutsui and Lichi Liu	
3.	*Use of Ant Colony Optimization for Finding Neighbourhoods in Non-stationary Markov Random Field Models* S. Le Hegarat, A. Kallel and S. Descombes	
4.	*A Neuro-fuzzy Scheme for Integrated Input Fuzzy Set Selection and Optimal Fuzzy Rule Generation for Classification* Santanu Sen and Tandra Pal	

KOLKATA

In the fall of 1687, Job Charnock, an agent of the East India Company secured permission from the Mughals to found a base at Sutanati. In 1696, Old Fort William was established and this was the origin of the city of Kolkata. The name Kolkata is derived from Kalikata, one of the three villages whose lands became a part of the new settlement. In the three centuries, Kolkata has grown from a mere fishing village into the largest cities in the India with a population of 10.5 million, and indeed, one of the largest cities in the world. Kolkata served as the capital of British India until 1912 and it is not surprising that one sees predominantly Western architectural styles in its many buildings and monuments. Two of the finest examples are Writers Building and the Victoria Memorial, where the architecture is a medley of the best of Occidental and Oriental styles. It is proud to have one of the best libraries and museum in Asia. Kolkata is a city with strong cultural, literary and scientific flavors. This is reflected in the ever increasing flow of activities in such diverse fields as science, fine arts, writing, music, dance and theatre. The first Nobel laureate in literature from Asia was from Kolkata and it was the main place of work of several other Nobel laureates.

Kolkata 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 Kolkata, 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 19th century on the bank of the river Hooghly, in the northern suberb of Kolkata. 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 20th 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 Kolkata, is derived from the famous Kali deity of this temple located at Kalighat in South Kolkata. A great attraction for Hindu pilgimage.

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 Octerloney 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 Kolkata 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 Kolkata 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.: 2440-4102/9753/54
Assembly of god Hospital & Research Centre: 2229-4853/4886
Belle Vue Clinic: Ambulance with medical facilities including oxygen, 24-hr doctor/nurse available: 2247-7473/6925/7920/ 7918/6921
B. M. Birla Heart Research Centre: 2456-7900/7100/7705/7102-5 St. John Ambulance Association: 24-hour ambulance with Oxygen Sealdah: 2350-4199
CMRI: 2456-7700/02/03/04, Fax: 2456-7880
Kolkata Medical College: 2241-49012-4/3953/3177/2962
Kothari Medical Centre: 2456-7051/7055/7059
Lansdown Nursing Home: Ideal place with life saving equipment: 2217-1001 to 04, Tel./Fax: 2217-7860
Peerless Hospital: 2462-0955/0766/6394/2394/2462
SSKM Hospital: 2223-9692
Woodlands Nursing Home: 2456-7079/7080

Ambulance & Other Medical Services

East West Medical Complex: Ambulance Services: 2476-2252/2280
Happy Kolkatans: Ambulance available with oxygen and emergency drugs: 2440-0160
Life Aid: Ambulance available: 2473-5807/417-1845
Lokenath Divine Society of India: 24-hour hours service: 2479-3301
Nightangle Ambulance Service: 2475-4169
Medicare Services: 2247-6111 to 12, 2247-6223

Trains / Flights

Howrah Station (inquiry): 2660-2581/3542/7412
Fairlie Place (inquiry): 2220-4025
Reservation : Manual : 135 (05 lines) Computerized: 136 (Eng) 137 (Hindi) 138 (Bengali)
Howrah (New Complex): 660-2217
Train information: Central Enquiry Manual: 1310, Recorded: 1331
Sealdah Station (Enquiry): 2350-3537/3535
Public Information Centres/Sealdah: 23503536
Air India: 2282-2356-59/282-1187 Airport: 2511-9031
Indian Airlines: 2236-4433 (24 hours)/236-0810/0730 Reservations: 141, 236-6869
Royal Brunei Airlines: 2229-7112/7105/9577/2014 Airport: 2511-8685, 2511-8787
Sahara India Airlines: 2282-7685 (City Office) Airport : 511-8357/8442
Singaport Airlines: Reservations/Ticketing: 2280-9898/8882/8883, Airport: 2511-9179/8978
British Airways: 2288-3451/32/53/54, 2288-9161/62 (City Office)
Airport: 511-8262/8424
Bangladesh Biman: 2229-2844 Airport: 2511-8787 Extn.: 4207
Druk Air: 2280-5376, 2240-2419, Airport: 2511-9894/9895 Telecheck in 2511-8836
KLM: 2240-3151, 2247-4593 (Fax) 2247-2444(Sales) Airport: 2511-8329
Royal Nepal: 2288-8549/8534/8635
NECON AIR: 2229-1802
Royal Jordanian: 47645091-3/4745094 Airport: 2511-9069
Thai Airways: 2280-1630-35 Airport: 2511-8189/8389

Police: Lalbazar (Police Control Room): 2215-5000, 2235-3024/0230
Bhawani Bhawan: 2479-1761-9, 2479-1933-6

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The International Association for Pattern Recognition (IAPR)

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