

BIO-DATA

1. Name : Dr. Sukhendu Das.
2. Date of birth : June 22, 1962.
3. Designation : Associate Professor,
and Address : Deptt. of Computer Science and Engg.,
IIT Madras, Chennai - 600036.
INDIA.

4. Academic qualifications:

Degree	Institute	Area/Discipline	Year
Ph. D	IIT Kharagpur	Computer Vision	1993
M. Tech	IIT Delhi	Computer Technology	1987
B. Tech	IIT Kharagpur	Electrical Engg.	1985

5. Experience :

(a) Work in India :

Organization	Designation	Period
IIT Madras	Lecturer	1989 - 1994.
IIT Madras	Asstt. Prof.	1994 – 2004.
IIT Madras	Assoc. Prof.	Since Jan. 2004.

(b) Work Abroad:

- Post-doctoral research work at the Deptt. of ET&IT, University of Applied Sciences, Pforzheim, Germany, from Dec. 2001 till May 2003.
- Gledden visiting scientist at the Deptt. Of CS&SE, University of Western Australia, Perth, Australia, from June – Aug. 2006.

- Australian Leadership Award Fellowship at the Deptt. Of CS&SE, University of Western Australia, Perth, Australia, from July – Sept. 2008.

(c) Visits Abroad :

Duration:	Place	Purpose
Oct. - Nov. 1995;	Neunkirchen, Germany.	Consultancy assignment.
Sept. 2002	Toulouse, France	Present a paper at EUSIPCO '02 Conf.
Sept. 2002	Malaga, Spain	Present a paper at IASTED/VIIP '02 Conf.
Aug. 2006	Hong Kong	Present a paper at IEEE-ICPR '06 Conf.
Jan. 2008	Seoul, Korea	Tutorial talks on “Computer Vision”
Nov. 2009	Cairo, Egypt	Present a paper at IEEE – ICIP '09 Conf.

6. Teaching Interests :

Course No:	Course Title
* CS 110	Introduction to Computing
* CS 212	Data Structures and Algorithms (& Lab.)
* CS 220	Switching theory and Digital Design (& Lab.)
* CS 240	Numerical Computing
* CS 321	Integrated Circuit Electronics (& Lab.)
CS 310	Programming Languages
CS 324	Microprocessors
CS 610	Programming and Data Structures
* CS 711	Introduction to Operating Systems
* CS 636	Computer Graphics
* CS 635	Computer Vision

- * **CS 671** **Advances in Visual Perception**
- CS 784 Computing with Artificial Neural Networks.
- * **CS 634** **Soft Computing**
- * **CS 687** **Digital Video Processing**

*- Courses taught so far.

7. Research interests :

Visual Perception - Computer Vision, Digital Image Processing, Pattern Recognition; Computer Graphics; Biometry; Computational Science and Engineering; Soft Computing.

8. Guidance (Ph. D./M.S./M. Tech./B. Tech.) :

Degree	Year	Name of the student	Title of the thesis
*Ph. D	2001	R. Balasubramanian	Some mathematical methods and simulation for the reconstruction of 3-D object primitives from arbitrary perspective views
*M. S.	1997	N. Sudha	Principal Component Neural Networks for Applications in Signal Processing.
M. S.	1998	N. Jagadeesh Babu	Texture Invariant Image Matching.
M. S.	1999	M. Sanjay	Matching Noisy Bitmap Images Based on Distance Transform.
*MS	2001	P. Kiran Kumar	Texture Edge Extraction using One Dimensional Processing
*M.S.	2002	S. Ramesh	Edginess Image for Face Recognition
*MS	2002	K. Sharat Reddy	Source and System Features for Speaker Recognition
*MS	2003	KVS Prasada Reddy	Automatic road detection from satellite images of urban areas.
*MS	2004	N.V. Palenkeswara Rao	Sneha-Samuham:A Parallel Computing Model over Grids

*MS	2004	P.Vinod	Text-dependent audio-visual biometric person authentication
*MS	2004	B. S. Venkatesh	Face detection in still gray image using Neural Networks
*MS	2006	A. Pavan Kumar	A WMPCA-based Face Recognition System on Programmable chip
MS	2007	Shivani G Rao	Estimation of orientation of an inclined planar texture using DWT: An approach to shape from texture
MS	2007	Arpita Patra	Development of Efficient method for face Recognition and Multimodal biometry
MS	2007	Manish Kalra	Framework for the fusion of 3D appearance and 2D shape cues for generic object recognition
MS	2007	P. Deepti	Generic object recognition with virtual Manifolds and its application
MS	2007	Lalit Gupta	Efficient texture segmentation by integrating region and edge information
MS	2008	Surya Prakash	Active Contour Based Foreground Object Segmentation
*MS	2008	R. Abhilash	Video Cut and Paste for 3D Composition – A Method of Video-Based Rendering for Virtual Reality Applications
MS	2009	Sunando Sengupto	Issues in 3D Reconstruction from Multiple Views
M.Tech	1991	S. Bandyopadhyay	An Approach to Determine the 3-D Position and Orientation of a Vehicle.
M.Tech	1994	M.Kulanthaivel	Recognition of 2-D Polygonal Shapes using Pattern Specific Features.
M.Tech	1994	S. R. Sharma	A study of Real Time Tracking of Moving Objects in Noisy Environments.
M. Tech	1994	S. Sujatha	Rendering of Simple 3D Geometrical Shapes.
*M.Tech	1994	B. M. B. Tikarya	Estimation of Motion and Structure Parameters from a Sequence of Noisy Images using

	Kalman Filter Approach.
M. Tech 1995 A. S. Arumugham	Errors in Reconstruction of a 3-D Line from Noisy Stereo Images : some Studies and Experimentation.
M. Tech 1995 Anupam	Depth Map Construction from Line Correspondences in Stereo Images.
*M. Tech 1995 Babu Thomas	Stereo Correspondences using Gabor Logons and Neural Networks.
*M. Tech 1996 V. Somanath	Compression Techniques for Database Query Project : INQUEST.
M. Tech 1996 V. K. Beri	Solid Object Modeling and Object Management for a 3-D Graphics Package: SOLIDRAW.
M. Tech 1996 B. Shivaramakrishnan	Viewing and Rendering Schemes for a 3-D Graphics Package: SOLIDRAW.
M. Tech 1996 P. Narasimhamoorthy	Raster Snap Function for Vectorization of Image Maps.
*M. Tech 1997 Viswam Gampala	3D Graphics Engine – An Object Oriented Approach (Visual Realism, Graphical User Interface).
*M. Tech 1997 S. Chandramouleeswaran	3D Graphics Engine – An Object Oriented Approach (Scene Definition and Management).
*M. Tech 1998 Ravindranathan K. R.	Unsupervised texture Segmentation Using Gabor Filters.
*M. Tech 1998 Amit Kumar Agrawal	An Interactive Graphics System for the Design of Buildings : A Structured Approach.
M. Tech 1998 H. M. Rafi Assadi	Optimal Filtering Approach and Neural Network Model for Edge Detection.
M. Tech 1998 Hanumanthu R.	Fingerprint identification.
M. Tech 1998 Sunil Kumar	Ridge Orientation based Fingerprint Matching.
*M. Tech 1998 S. Jagadish	Surface Reconstruction from Planar Contours Extracted from MRI Images.
M. Tech 1999 J. N. Subramanyam	Design and Development of an Image

	Processing Engine on X-Windows.
M. Tech 1999 B. V. J. Manohar	Reconstruction of Road Network from Aerial Images for GIS Applications.
M. Tech 1999 J. Rajamohan	Raster Snap function for Vectorization of Bitmap Images.
M. Tech 1999 K. S. Praneshwar Rao	Organization of Video database for Browsing and Retrieval.
*M. Tech 1999 V. Kondala Rao	Speaker Clustering using SOM.
M. Tech 1999 D. V. Bhaskar Reddy	Development of a Software Tool for the Aid of Cricket Umpires.
M. Tech 1999 G. Vidyasagar	Person Authentication Using Audio and Video Data.
M. Tech 2006 Pragya Minz (Dual)	Navigation tool in 3D environment
M. Tech 2008 M. P. Subramanian	Content Based Video Retrieval Based on Shape and Motion Trajectory of Video Objects.
M. Tech 2008 Krishna Biswas	Design and Implementation of a Game Description language using OpenGL
M. Tech 2009 Nimit Jain (Dual)	3-D Modeling and Realistic Image Based Rendering
B. Tech 1995 Praveen Kumar	Image Compression techniques : A comparative study.
*B. Tech 1998 Ajay Chakraborty	Traffic Flow Simulator.
B. Tech 1998 Chandrasekhar Yalangi	A Graphical Tool for the Aid of Cricket Umpires.
*B. Tech 2007 J. Deepak	Procedural Texture Synthesis and 3D Surface Wrapping
B. Tech 2008 Mahesh Kumar Reddy	A Real-time Face Recognition System using Modular PCA approach
B. Tech 2009 Ravi Teja	Image Enhancement, Segmentation and Pose Estimation in Videos.

* -- Guided jointly with another faculty member.

Currently, guiding **three (one submitted theses) Ph.D and Eight (8) M.S. Scholars and two (2) B. Tech.** students.

9. Courses introduced:

CS 635	Computer Vision. (1994, modified July 2005)
CS 671	Advances in Visual Perception (July 2005)
CS 687	Digital Video Processing (Oct. 2008)

10. Lab/Design/Development Activity :

(i) **VISUALIZATION and PERCEPTION Laboratory** was established and set up in August 2004.

(URL: //www.cse.iitm.ac.in/~sdas/vplab.html).

(ii) Faculty in-charge of departmental computing facility (DCF), from 2003-2005.

(iii) Faculty in-charge - Classroom Electronic facility– PC + projection + PA system; 2004-2009.

11. Projects undertaken:

(a) Sponsored:

(Prior to year 2004)

Agency	Value	Title	Other Coordinators	Year
ONR, USA	Rs. 19.00 Lakhs	&&	Prof. B. Yegnanarayana	1998-2001
ISRO, INDIA	Rs. 7.80 Lakhs	##	Prof. B. Yegnanarayana, Dr. Koshy Varghese	1997-2000
INTEL ASIA	Rs. 60.00 Lakhs	@@	Prof. B. Yegnanarayana Dr. C. Chandrasekhar Dr. Hema A Murthy	1999-2004
ISRO, INDIA	Rs. 1.00 Lakhs	**	Prof. B. Yegnanarayana	1998-1999

- && - Information Recovery from Partial Data for Image Processing Applications.
- ## - Development of techniques for Classification of Urban Features from remote Sensed Data for use in GIS Applications : A Multi-disciplinary approach.
- @@ - Development of Phonetic Engine for Speech in Indian Languages.
- ** - Neural Network Models for Health Monitoring of Propulsion Systems.

Since year 2004:

Agency	Value	Title	Whether as PI	Year
MHRD (GOI)	Rs. 20.80 Lakhs	&&	YES	2004-2006 (Completed)
DRDO (GOI)	Rs. 10.00 Lakhs	\$\$	YES	2004-2006 (Completed)
DRDO (GOI)	Rs. 22.92 lakhs	**	YES	2004-2006 (Completed)
MIT (GOI)	Rs. 39.60 Lakhs	%%	NO	2005-2007
DST (GOI)	Rs. 14.04 Lakhs	§§	NO	2005-2007
DRDO (GOI)	Rs. 9.85 Lakhs	@@	YES	2006-2007
DRDO (GOI)	Rs. 9.95 Lakhs	##	YES	2007-2009
DIT (GOI)	Rs. 40.4 Lakhs	++	NO	2008-2011
ICMR (Indo-German)	Rs. 15.00 lakhs	!!	NO	2008-2010
DIT	Rs. 104.0 Lakhs	~~	NO	2009-2012

- && - Multi-modal biometrics based secured access system using face and fingerprint recognition.
- \$\$ - SAR image exploitation, Classification of Man-made and Natural regions, Automatic Target Detection.
- ** - Probabilistic Classification of Satellite Images to Obtain Landform Patterns.
- %% - Minimal Object Oriented Linux.
- §§ - Integration Knowledge system on soil Nutrient management through Image Processing of Chromatograms.
- @@ - Recovery of 3D shapes based on multiview textures.
- ## - Combining Classifiers using Decision Fusion: An approach to Probabilistic Landform Segmentation.
- ++ - Research and Development of Multi-camera algorithms for security and surveillance.
- !! - Telemedicine station for Rural Health Monitoring and diagnosis of epidemic diseases.
- ~~ - Service Oriented Architecture and its implementation for the Linux Kernel, middleware (NRCFOSS Phase II)

(b) Consultancy :

Agency	Value	Title	Other Coordinators	Year
PGG, Nuenkirchen, Germany.	Rs. 2.5 lakhs	**	Prof. B. Yegnanarayana (PI)	1994-96
HCL Technologies, India	Rs. 0.45 Lakhs	&&	NIL	2000-01
Metricone Technologies, India	Rs. 1.0 Lakhs	@@	NIL	2001
HCL Technologies, India.	Rs. 0.40 Lakhs	%%	NIL	2001
ATB, (GOI) Secundrabad	Rs. 15.00 lakhs	++	Dr. Anurag Mittal	2008-09

DRDO (GOI)	Rs. 9.98 Lakhs	""	Prof. T. S. Natarajan (Deptt. of Phys.)	2009-11
**	-		Image Processing algorithms for GIS.	
&&	-		Algorithms for Simulation and Image Analysis	
@@	-		Algorithms for Fingerprint Identification	
%%	-		Traffic Signal Identification	
++	-		Sizing of Sensors for Tracking Trainee Movements in Simulation Arena.	
""	-		Smart segmentation of objects in images	

12. Text Books, Monographs, etc. Authored :

NIL

13. CEC programs and Conferences organized :

- (a) CEC Short-term course on “**Computer Graphics and Image Processing**”, conducted at IIT Madras during 18-19th, April, 1997, for Industries and Academic Institutions, with Dr. Hema A Murthy.
- (b) Co-convenor of the **International Conference on Multimedia Processing and Systems**, IIT Madras, Chennai, during August 13-15, 2000.
- (c) Faculty incharge on the IBM-day event held in IIT Madras, on August 11, 2007.
- (d) **Technical co-chair** – Conference on Cloud Computing and Virtualization – May 2010, Singapore.

14. Awards/Honours Received & Patents:

- (i) **Winner (best design) at the design contest of "SOPC World" event on Embedded Systems and VLSI systems,**

conducted by ALTERA in Bangalore, 2004; jointly with Dr. V. Kamakoti and Pavan Kumar.

(ii) Best paper award at National Conference on Image Processing (NCIP '05), Bangalore, for Vinod Pathangay and Dr. Sukhendu Das for their work published in the paper entitled "Exploring the use of selective Wavelet Subbands for PCA based Face Recognition", March 2005.

(iii) Best paper at National Conference on Computer Vision, AI and Robotics (NCCVAIR '07), at Chennai, awarded to Sunando Sengupta and Dr. Sukhendu Das for their work published in the paper entitled "Error Norm for Determining 3D Structure from Different Appearances of an Object", October 2007.

15. Professional Societies involved : IEEE, USA (Computer and SMC).

Reviewed technical papers for the following international journals:

- (i) IEEE Transactions on Pattern Analysis and Machine Intelligence
- (ii) IEEE Transactions on Image Processing
- (iii) IEEE Transactions on Systems, Man and Cybernetics
- (iv) Pattern Recognition Letters.
- (v) Journal of Information Fusion
- (vi) International Journal of Biomedical Imaging
- (vii) Signal Processing
- (viii) Pattern Recognition
- (ix) Neuro-Computing

16. Research work in progress:

- (a) Established a framework on GENERIC OBJECT RECOGNITION
- (b) Generic Scene classification, using perceptual models
- (c) Decision fusion and multi-modal feature fusion strategies for applications in biometry, scene classification, probabilistic classification of aerial images etc.
- (d) Matching images from noisy scenes - special relevance to texture and satellite images.
- (e) Adaptive edge detection for textured and non-textured images.

- (f) Reconstruction of 3D primitives from a turn-table sequence (modified auto-calibration from projective transforms).
- (g) Integration of Audio-Image-Video for Biometry.
- (h) Analyzing video sequence for tracking, estimation, detection and reconstruction of moving objects and CBVR - noisy and noise-free cases.
- (i) Exploration of invariant shape features for shape matching and target detection.
- (j) Content based Video object (shot) representation and retrieval.
- (k) GDL – a new “Game Description language”, with OpenGL game engine modules
- (l) Video-based rendering for 3-D composition
- (m) Foreground object detection
- (n) Blind Image Quality assessment.

17. List of research publications :

A. JOURNAL (Published/Accepted)

- 1.1). "Thresholding for Edge Extraction of Intensity Images"; Jayanta Mukherjee, S. Das and B.N. Chatterji; Publication of Indian Journal of Engineers, Annual Number 1992; pp 20-29.
- 1.2). " Cut-off Frequencies of Transmission Lines Consisting of Pair of Cylinders " ; B. N. Das, S. B. Chakraborty and S. Das ; IEEE Transactions on Microwave Theory and Techniques, Vol. 44, No: 11, Nov., 1996, pp. 2110-2112.
- 1.3). " 3D Tool Wear Measurement and Visualization using Stereo Imaging"; Karthik A, S. Chandra, B. Ramamoorthy and S. Das; International Journal of Machine Tools and Manufacture, Vol. 37, No. 11, 1997, pp. 1573-1581.
- 1.4). " Evaluation of characteristic impedance of twin-wire transmission line insulated by multilayer dielectric " ; S. B. Chakraborty, B. N. Das, S. Das and R. Bhattacharjee ; International Journal of Electronics, Vol. 83, No. 5, pp. 615-622, 1997.
- 1.5). " Analysis of a pair of dielectric coated cylinders above a ground plane using conformal transformation " ; S. Das and B. N. Das ; IETE (India) Journal of Research, Vol. 44, NO. 3, May-June 1998, pp 99-103.
- 1.6). "Capacitance of Transmission Line of Parallel Cylinders with Variable

Radial Width"; B. N. Das, S. Das and Debashis Parida; IEEE Transactions on Electromagnetic Compability, Vol. 40, No. 4, Nov. 1998, pp 325 - 330.

1.7). "Analysis of a pair of dielectric coated cylinders above a Dielectric Substrate"; B. N. Das and S. Das; IETE journal of Research; Vol. 46, No. 3, May-June 2000, pp 157-161.

1.8). "Capacitance matrix of a pair of Dielectric Coated Cylinders of unequal Diameters above a ground plane"; B. N. Das, Debashis Parida, S. Das and G. Panda"; International Journal of Electromagnetics; Vol. 21, No. 3, April 2001, pp 231-245.

1.9). "Error Analysis in Reconstruction of a Line in 3-D from Two arbitrary perspective Views"; R. Balasubramanian, Sukhendu Das and K. Swaminathan, International Journal of Computer Mathematics, Vol. 78, No. 2, Feb. 2001, pp 191-212.

1.10). "Quantization error in stereo imaging systems"; R. Balasubramanian, Sukhendu Das, S. Udayabaskaran and K. Swaminathan; International journal of Computer Mathematics, Vol. 79, No: 6, July, 2002, pp 671-691.

1.11). "Reconstruction of quadratic curves in 3-D from two or more perspective views"; R. Balasubramanian, Sukhendu Das and K. Swaminathan; Mathematical problems in Engineering, Vol. 8, No. 2, 2002, pp 207-219.

1.12). "Simulation studies for the performance analysis of the reconstruction of a line in 3-D from two arbitrary perspective views using two plane intersection method", R. Balasubramanian, Sukhendu Das and K. Swaminathan, International Journal of Computer Mathematics, Vol. 80, No.5, 2003, pp. 559-571.

1.13). "Bestimmung der Objektform durch Bildanalyse der Oberfluentextur-Merkmalsgewinnung mittels M-Kanal Wavelet-Transformation"; Thomas Greiner and Sukhendu Das, Journal of "Automatisierungstechnik", Oldenbourg Publishers (Germany): Vol. 54 (10), Oct., 2006, pp 475-485.

1.14). "System-on-Programmable-Chip Implementation for online Face Recognition", A. Pavan Kumar, V. Kamakoti, Sukhendu Das, Pattern Recognition Letters (Elsevier), Volume 28, No. 3, pages: 342-349, February 2007.

1.15). "Indoor Vs. Outdoor Scene Classification using Probabilistic Neural Network", Lalit Gupta, Vinod Pathangay, Arpita Patra, A. Dyana and Sukhendu Das, EURASIP Journal of Advances in Signal Processing (JASP), Vol. 2007, pp 1-10.

1.16). "A method of shape recognition using group delay function", Sreyasee D.B., Sukhendu Das and Amitava Datta, International Journal of Imaging

Science and Engineering (IJISE, GA, USA, ISSN:1934-9955,), Vol.1, No.3, pp. 90-95, July 2007.

1.17). "SnakeCut: An Integrated Approach Based on Active Contour and GrabCut for Automatic Foreground Object Segmentation"; Surya Prakash, R. Abhilash and Sukhendu Das; Special Issue on Vision and Multimedia Processing, in the Journal of *Electronic Letters on Computer Vision and Image Analysis* (ELCVIA), Vol. 6, No. 3, December 2007, pp 13-29.

1.18). "Automatic Curvilinear Structure detection from Satellite Images using Multiresolution GMM ", Mirnalinee Dhinesh, Sukhendu Das and Koshy Varghese, International Journal of Imaging Science and Engineering (IJISE, GA, USA, ISSN:1934-9955), Vol.2, No.1, pp. 154-157, January 2008.

1.19). "Enhancing Decision Combination of Face and Fingerprint by Exploitation of Individual Classifier Space: An approach to Multi-modal Biometry", Arpita Patra and Sukhendu Das, Journal of PATTERN RECOGNITION (Elsevier), Vol. 41, No. 7, pp. 2298-2308, July 2008.

1.20). "Integrating Region and Edge Information for Texture Segmentation using a modified Constraint Satisfaction Neural Network", Lalit Gupta, Utthara G.M. and Sukhendu Das, Journal of Image and Vision Computing (Elsevier; Impact Factor: 1.496), Vol.26, No.8, pp 1106-1117, August 2008.

1.21). "A Framework for Fusion of 3D Appearance and 2D Shape Cues for Generic Object Recognition", Manisha Kalra, Sunando Sengupta and Sukhendu Das, Journal of Pattern Recognition Research (JPRR), Vol. 3, No. 1, September 2008, pp 54-70.

1.22). "Trajectory Representation using Gabor Features for Motion-Based Video Retrieval", A. Dyana and Sukhendu Das, Pattern Recognition Letters (Elsevier; Impact Factor: 1.559), Vol. 30, No. 10, pp. 877-892, July 2009.

1.23). "Estimation of Orientation of a Textured Planar Surface using Projective Equations and Separable Analysis with M-Channel Wavelet Decomposition" Thomas Greiner, Shivani G Rao and Sukhendu Das, Journal of PATTERN RECOGNITION (Elsevier; Impact Factor: 3.279), Vol. 43(1), pp 230-243, January 2010.

1.24). "Design of an improved framework for stratified 3-D reconstruction from a pair of images, with reduced ambiguity", Sunando Sengupta and Sukhendu Das; Accepted for publication in International Journal of Computer Mathematics (Impact Factor: 0.308), June 2009.

1.25). "A Survey of Decision Fusion and Feature Fusion Strategies for Pattern Classification", Utthara Gosa Mangai, Suranjana Samanta, Sukhendu Das and Pinaki Roy Chowdhury; Accepted for publication in IETE Technical Review, October 2009.

B. CONFERENCES/WORKSHOPS/SYMPOSIUM (Published/Accepted)

2.1). "Wire Framing of Range Images "; J. Mukherjee, S. Das, B. N. Chatterji et. al.; Proceedings of the INDO-US Workshop on Spectral Analysis in one or two Dimensions ; Nov. 27-29, 1989, New Delhi, INDIA.

2.2). "A Recursive algorithm for modal Analysis of the Histogram of images " ; J. Mukherjee, S. Das and B. N. Chatterji ; Proceedings of the IEEE International Conference of Image Processing ; Sept. 1989, Singapore.

2.3). "Analysis of difference pictures for detecting object motion " ; S. Das, J. Mukherjee and B. N. Chatterji ; Proceedings of the first International Conference on Automation, Robotics and Computer Vision, Singapore , 19-21 Sept. 1990, pp 866-870.

2.4). "Detecting occlusion from feature correspondences of multiple moving rigid objects " ; S. Das, J. Mukherjee and B. N. Chatterji ; Proceedings of the second International Conference on Automation, Robotics and Computer Vision ; Singapore , 15 - 18 Sept. 1992.

2.5). "Motion Analysis from of Dynamic Stereo Images " ; S. Das, J. Mukherjee and B. N. Chatterji ; Proceedings of the discussion meeting on Recent Advances in Signal Processing and Communications ; Jan., 18-20, 1993; Indian Institute of Science, Bangalore, India ; pp 53-58.

2.6). "Parallel Implementation of a Robust Algorithm for tracking moving objects "; S. Das and B. N. Chatterji ; Proceedings of the International Workshop on Parallel Processing ; Dec. 26-31, 1994; Bangalore, India, pp 151-156.

2.7). "Stereo Correspondence using Gabor Logons"; Babu Thomas, B. Yegnanarayana and S. Das ; IEEE Conference on Image Processing (ICIP'95); 23-26 Oct., 1995, Washington D.C., USA, pp 386-389.

2.8). "Performance Analysis of a Dynamic Programming based Algorithm for matching lines in Stereo Images " ; Anupam and S. Das ; International Conference on Automation (IC- AUTO'95), Dec. 12-16, 1995, Indore, India.

2.9). "On a Fuzzy Neural Network Approach to Pattern Recognition " ; R. Karthikeyan and S. Das ; Indian Conference on Pattern Recognition, Image Processing and Computer Vision (ICPIC' 95) Dec. 13-15, 1995, IIT Kharagpur, India, pp 111.

2.10). "Matching Noisy Bitmap Images based on Distance Transform " ; N. Jagadeesh Babu, M. Sanjay, B. Yegnanarayana and Sukhendu Das ;

Proceedings of the International Symposium on Intelligent Robotic Systems ; Jan. 10-12, 1998, Bangalore, India, pp. 386-391.

2.11). "One-Dimensional Gabor Filtering for Texture Edge Detection"; B. Yegnanarayana, G. Pavan Kumar and Sukhendu Das, Indian Conference on Computer Vision, Graphics and Image Processing, 21-23 Dec., 1998, New Delhi, INDIA, pp 231-237.

2.12). "Robust Template Matching for Noisy Bitmap Images Invariant to Translation and Rotation"; M. Sanjay, Sukhendu Das and B. Yegnanarayana, Indian Conference on Computer Vision, Graphics and Image Processing, 21-23 Dec., 1998, New Delhi, INDIA, pp 82-88.

2.13). "Reconstruction of Road Network from scanned aerial images for GIS Applications" ; B.V.J. Manohar, Sukhendu Das, B. Yegnanarayana and Koshy Varghese ; Geoinformatics : Beyond 2000, an International Conference on Geoinformatics for Natural Resource Assessment, Monitoring and Management ; March 9-11, 1999 ; Indian Institute of Remote Sensing (NRSA), Dehradun, India.

2.14). "Analytical Formulations for Reconstruction of a line in 3-D Space from Two Arbitrary Perspective Views"; R. Balasubramanian, Sukhendu Das and K. Swaminathan; International Satellite Conference on Image Analysis in Materials and Life Sciences, IGCAR, Kalpakkam, India, Nov. 7-11, 1999 (proceedings yet to appear).

2.15). "Reconstruction of a 3-D (Object) Depth Map Using Shape from Shading with Perspective Projections "; R. Balasubramanian, Rajan M.P., Sukhendu Das and K. Swaminathan; Proceedings of the International Conference on Mathematical Modeling of Non-linear Systems; Vol. 1, IIT Kharagpur, India, Dec. 8-11, 1999, pp 119-133.

2.16). "One Dimensional Processing of Image"; P. Kiran Kumar, Sukhendu Das and B. Yegnanarayana; International Conference on Multimedia processing and Systems, ICMPS-2000, August 13-15, 2000, IIT Madras, India, pp 181-185.

2.17). "Reconstruction of 3-D Quadratic curves from Arbitrary Perspective Views"; R. Balasubramanian, Sukhendu Das and K. Swaminathan; International Conference on Communications, Computers and Devices (ICCCD 2000);, Dec. 14-16, 2000, IIT Kharagpur, INDIA, pp 477-480.

2.18). "Detecting Road segments from Satellite Images"; K. V. S. Prasada Reddy, Sukhendu Das, Koshy Varghese and B. Yegnanarayana; International Conference on Communications, Computers and Devices (ICCCD 2000); Dec. 14-16, 2000, IIT Kharagpur, INDIA, pp 451-454.

2.19). "1-D Gabor phase for edge detection in texture Images"; P. Kiran Kumar, B. Yegnanarayana and Sukhendu Das; International Conference on Communications, Computers and Devices (ICCCD 2000); Dec. 14-16, 2000, IIT Kharagpur, INDIA, pp 425-428.

2.20). "Effect of unequal focal length cameras in two perspective views"; R. Balasubramanian, Sukhendu Das and K. Swaminathan; International Conference on Recent Advances in mathematical Sciences"; Dec. 20-22, 2000, IIT Kharagpur, INDIA, pp 193-200.

2.21). "One-Dimensional Processing for Edge Detection using Hilbert Transform"; P. Kiran Kumar, Sukhendu Das and B. Yegnanarayana; Indian Conference on Computer Vision, Graphics and Image Processing, ICVGIP-2000, Dec. 20-22, 2000, Bangalore, INDIA, pp 25-31.

2.22). "Simulation studies for the performance analysis of reconstruction of a line using stereoscopic projections" ; R. Balasubramanian, Sukhendu Das and K. Swaminathan; Indian Conference on Computer Vision, Graphics and Image Processing, ICVGIP-2000, Dec. 20-22, 2000, Bangalore, INDIA, pp 338-344.

2.23). "Multi-resolution approach to linear feature extraction from satellite images: application to semi-automatic road identification"; K. V. S. Prasada Reddy, Sukhendu Das and Koshy Varghese; International Conference on Remote Sensing and GIS (ICORG-2001); Feb. 01-04, 2001, Hyderabad, INDIA, pp 562-565.

2.24). "Edge extraction from noisy stochastic textures using 1-D Gabor phase"; B. Yegnanarayana and Sukhendu Das; Workshop on Nonlinear Signal and Image Processing (NSIP-2001); June 3-6, 2001; Baltimore, Maryland USA

2.25). "Simulation studies for the reconstruction of a straight line in 3D from two arbitrary perspective views using epipolar line method"; K. Swaminathan, S. Das, R. Balasubramanian , SPIE Symposium on Photonics-West 2002; Vol. 4667, 19 - 25 January 2002, San Jose, California, USA, pp. 418-428.

2.26). S. Ramesh, B. Yegnanarayana, Sukhendu Das and Rama Chellappa," Face Recognition using edginess-based representation", Proceedings of the Workshop on Signal Processing, Communication, Chaos and Systems, Newport, USA, June 2002, pp 136-141.

2.27). "Eigenedginess vs. eigenhill, eigenface and eigenedge"; S. Ramesh, Sukhendu Das and B. Yegnanarayana, XI European Signal Processing Conference (EUSIPCO' 2002), Vol. III/III, September 3-6, 2002, Toulouse, France, pp 559-562.

2.28) "Wavelet based separable analysis of texture images for extracting orientation of a planar surface"; Sukhendu das and Thomas Greiner; Second International Conference on Visualization, Imaging and Image processing (IASTED-VIIP), Malaga, Spain, Sept.9-12, 2002, pp 607-612.

2.29). "Recovering Orientation of a textured planar surface using Wavelet transform"; Thomas Greiner and Sukhendu Das, Indian Conference on Computer Vision, Graphics and Image Processing, ICVGIP-2002, Dec. 16-18, 2002, SAC Ahmedabad, INDIA, pp 254-259.

2.30) "Face recognition using Weighted Modular Principle Component Analysis"; A Pavan Kumar, Sukhendu Das and V. Kamakoti, International Conference On Neuro-Information Processing (ICONIP-2004), LNCS 3316, pp. 362-367, Nov. 2004, Kolkata, India.

2.31) "Unsupervised segmentation of texture images using a combination of Gabor and wavelet features; Shivani G. Rao, Manika Puri, Sukhendu Das; Indian Conference on Computer Vision, Graphics and Image Processing, ICVGIP-2004, Dec. 2004, ISI Calcutta, India, pp 370-375.

2.32). "An Architecture for Real Time Face Recognition using WMPCA; A. Pavan Kumar, V. Kamakoti, Sukhendu Das; Indian Conference on Computer Vision, Graphics and Image Processing, ICVGIP-2004, Dec. 2004, ISI Calcutta, India, pp 645-649.

2.33) "Classification of Textures in SAR Images using multi-channel multi-resolution filters" ; Lalit Gupta, Sukhendu Das, Shivani G. Rao; NCIP-2005, March-2005, NIAS IISc. Bangalore, India, pp 198-201.

2.34). "Exploring the use of selective Wavelet Subbands for PCA based Face Recognition"; Vinod Pathangay, Sukhendu Das; NCIP-2005, March-2005, NIAS IISc. Bangalore, India, pp 182-185.

2.35). "Texture Edge Detection using Multi-resolution Features and Self Organizing Map"; Lalit Gupta and Sukhendu Das; IEEE International Conference on Pattern Recognition (ICPR-06), , Hong Kong, Vol. 2, Aug.20-24 2006, pp 199-202.

2.36). Study of the performance of different texture features for Classification of SAR images"; Lalit Gupta, S. Lekshmi, Jharna Majumdar and Sukhendu Das; IEE Visual Information Engineering (VIE) Conference, Bangalore, Sept. 26-28, 2006, pp 315-320.

2.37). "Dual space based face recognition using information fusion"; Arpita Patra and Sukhendu Das; IEE Visual Information Engineering (VIE) Conference, Bangalore, Sept. 26-28, 2006, pp 155-160.

2.38). "Error Analysis of M-channel DWT based method for orientation estimation of an inclined planar texture surface"; Shivani G Rao, Sukhendu Das and Thomas Greiner; IEE Visual Information Engineering (VIE) Conference, Bangalore, Sept. 26-28, 2006, pp 321-326.

2.39). "Generic Object Recognition using 2D PCA and Virtual Manifolds"; P. Deepti and Sukhendu Das; IEE Visual Information Engineering (VIE) Conference, Bangalore, Sept. 26-28, 2006, pp 18-23.

2.40). "Generic Object Recognition using a combination of ICA and Shape Cues", Manisha Kalra, Sukhendu Das and Amitava Datta; IEEE Conference on Advanced Video and Signal based Surveillance (AVSS '07), Australia, Nov. 22-24, 2006, pp 14(6).

2.41). "Pose invariant Generic Object Recognition based on orthogonal axis Manifolds in linear subspace", Manisha Kalra, P. Deepti, R. Abhilash and Sukhendu Das, Indian Conference on Computer Vision, Graphics and Image Processing, ICVGIP' 06, LNCS 4338, Madurai, India, Dec 13-16, 2006, pp 619-630.

2.42). "A Hierarchical approach to Landform Classification of Satellite Images using a Fusion Strategy", Aakanksha Gagrani, Lalit Gupta, B. Ravindran, Sukhendu Das, PinakiRoy Choudhary and V.K Panchal Das, Indian Conference on Computer Vision, Graphics and Image Processing, ICVGIP' 06, LNCS 4338, Madurai, India, Dec 13-16, 2006, pp 140-151.

2.43). "Selection of Wavelet Subbands using Genetic Algorithm for Face Recognition", Vinod Pathangay and Sukhendu Das, Indian Conference on Computer Vision, Graphics and Image Processing, ICVGIP' 06, LNCS 4338, Madurai, India, Dec 13-16, 2006, pp 585-596.

2.44). "External Force Modeling of Snakes using DWT for Texture Object Segmentation", Surya Prakash and Sukhendu Das, 6th International Conference on Advances in Pattern Recognition (ICAPR '07), Kolkata, January 2-4, 2007, pp 215-219.

2.45). "Integrating Linear Subspace Analysis and Interactive Graphcuts For content-Based Video Retrieval", P.Deepti, R.Abhilash and Sukhendu Das, 6th International Conference on Advances in Pattern Recognition (ICAPR '07), Kolkata, January 2-4, 2007, pp 263-267.

2.46). "A framework for fusion of 3D appearance and 2D shape cues for generic object recognition", Manisha Kalra and Sukhendu Das, 6th International Conference on Advances in Pattern Recognition (ICAPR '07), Kolkata, January 2-4, 2007, pp 332-337.

2.47). "An efficient Approach for Texture Classification with Multi-resolution features by Combining Region and Edge information using a modified

CSNN", Lalit Gupta and Sukhendu Das, 6th International Conference on Advances in Pattern Recognition (ICAPR '07), Kolkata, January 2-4, 2007, pp 407-412.

2.48). "Analysis of Difference in Orientations and Focal Lengths of Two Arbitrary Perspective Viewing Cameras", Aishwarya Ramachandran, R. Balasubramanian, K. Swaminathan, and Sukhendu Das, Vision Geometry XV, IS&T/SPIE International Symposium on Electronic Imaging-2007, January 28-February 1, 2007, San Jose, California, USA. Vol.6499, pp 1-12.

2.49). "Automatic Curvilinear Structure Detection from Satellite images using Multi resolution GMM", T T Mirnalinee, Sukhendu Das and Koshy Varghese, ICACC' 07, Madurai, India, February 9-10, 2007, pp. 146-149.

2.50). "A Method of Shape Recognition Using the Smoothed Group Delay Function", Sreyasee Das Bhattacharjee, Sukhendu Das and Amitava Datta, ICACC' 07, Madurai, India, February 9-10, 2007, pp. 621-626.

2.51). "Chromatogram Image Pre-Processing and Feature Extraction for Automatic Soil Analysis", Saritha V, Minu Mary Joseph, Sukhendu Das, and Deepak Khemani, International Conference on Computing: Theory and Applications (ICCTA '07), ISI Kolkata, March 5-7, 2007, pp 726-730.

2.52). "Error Norm for Determining 3D Structure from Different Appearances Of an Object"; Sukhendu Das and Sunando Sengupta; National Conference on Computer Vision, AI and Robotics (NCCVAIR'07); 3rd-5th October 2007; Chennai, India, pp 1-7.

2.53). "A modified curvature Scale space for Convex shapes"; *A. Dyana and Sukhendu Das*; National Conference on Computer Vision, AI and Robotics (NCCVAIR'07); 3rd-5th October 2007; Chennai, India, pp 23-27.

2.54) "Spatio-temporal Descriptor using 3D Curvature Scale Space", A. Dyana and Sukhendu Das, International Conf. on Pattern Recognition and Machine Intelligence (PREMI '07), 18-22 Dec. 2007, ISI Kolkata, LNCS-4815, pp 632-640.

2.55) "Segmenting Multiple Textured Objects using Geodesic Active Contour and DWT", Surya Prakash and Sukhendu Das, International Conf. on Pattern Recognition and Machine Intelligence (PREMI '07), 18-22 Dec. 2007, ISI Kolkata, LNCS-4815, pp 111-118.

2.56) "Road extraction from high resolution images using Orientation and Area Discrimination", T.T Mirnalinee and Sukhendu Das, National Conference on Computer Vision, Pattern Recognition, Image processing and Graphics (NCVPRIPG '08), Gandhinagar, Gujarat, India, January 11-13, 2008, pp 83-88.

2.57) "Refinement in 3D Reconstruction using Chirality Constraints ", Sunando Sengupta and Sukhendu Das; National Conference on Computer Vision, Pattern Recognition, Image processing and Graphics (NCVPRIPG '08), Gandhinagar, Gujarat, India, January 11-13, 2008, pp 65-72.

2.58) "Video Cut and Paste for 3D Composition", Abhilash Raipally, and Sukhendu Das; International Conference of ACM-Compute 2008, Bangalore, India, January 18-20, 2008, pp 1-8.

2.59). "Symmetry-based Face Pose Estimation from a Single Uncalibrated View", Vinod Pathangay and Sukhendu Das, Eighth IEEE International Conference on Automatic Face and Gesture Recognition, Amsterdam, Netherlands, September 17-19, 2008, pp 1-8.

2.60). "Modified Auto-calibration for 3D Reconstruction from Multiple Views of an Object", Sunando Sengupta and Sukhendu Das, IEEE TENCON 2008, Hyderabad, India, November 18-21, 2008, pp 1-6.

2.61). "Occluded Shape (2-D) Recognition Using Edge Based Features", Sreyasee Das Bhattacharya, Sukhendu Das and Amitava Datta, IEEE TENCON 2008, Hyderabad, India, November 18-21, 2008, pp 1-6.

2.62). "Interpretation of Chromatogram Image to Automate Soil Analysis", V. Saritha, Minu J., Deepak Khemani and Sukhendu Das, IEEE TENCON 2008, Hyderabad, India, November 18-21, 2008, pp 1-6.

2.63). "Soil Nutrient Analysis by Image Processing of Chromatograms through CBR techniques of Knowledge management", A. Sivakumar, S.M. Michael, Deepak Khemani and Sukhendu Das, International Conference on "Spirit of Research, Spirit of Innovation", PIRS '08, Chennai, India, Dec. 19-20, 2008, pp 66-69.

2.64). "Eigen-domain Relighting of Face Images for Illumination-invariant Face Verification", Vinod Pathangay and Sukhendu Das, IEEE Conf. on ICAPR '09, Kolkata, India, Feb. 4-6, 2009, pp 437-440.

2.65). "Integration of Region and Edge-based information for efficient Road Extraction from High Resolution Satellite Imagery", T.T. Mirnalinee, Sukhendu Das and Koshy Varghese, IEEE Conf. on ICAPR '09, Kolkata, India, February 4-6, 2009, pp 373-276.

2.66). "Combining features for Shape and Motion Trajectory of Video Objects for efficient Content based Video Retrieval", A. Dyana, M.P. Subramanian and Sukhendu Das, IEEE Conf. on ICAPR '09, Kolkata, India, February 4-6, 2009, pp 113-116.

2.67). "A Novel method of Supervised Edge detection for identifying Boundaries of Texture Regions", Utthara G. Mangai and Sukhendu Das,

International Conference on Innovative Technologies (ICIT-09): Research and Development in Science, Technology and Management, Bahadurgarh, India, June 18-19, 2009.

2.68). "Unsupervised Texture Segmentation Using Feature Selection And Fusion" , Suranjana Samanta and Sukhendu Das, Accepted in IEEE Conf. on Image processing (ICIP '09), Cairo, Nov. 7-11, 2009.

2.69). "A Fast Supervised Method of Feature Ranking and Selection For Pattern Classification", Suranjana Samanta and Sukhendu Das; Accepted in 3rd International Conference on Pattern Recognition and Machine Intelligence (PReMI'09), LNCS Publication, IIT Delhi, Dec. 16-20, 2009.

18. Additional responsibilities, academic and extra-curricular:

- i) **Chairman, PRSG review committee** for the Ministry of Information Technology (GOI) project entitled "Robust Watermarking of Digital Images using Wavelet like Transforms for Image Security"; Univ. of Madras, Chennai, India, 2005-08.
- ii) **Chairman, PRSG review committee** for the Ministry of Information Technology (GOI) project entitled "An investigation on the impact of encoding schemes in Steganography and Watermarking algorithms"; Andhra University, Vishakapatnam, India, 2009-10.
- iii) Member, PRSG review committee for the Ministry of Information Technology (GOI) project entitled "Design of New Iris Recognition System for Personal Authentication with Orthogonal Polynomials Model" by Bharathidasan Institute of Technology, Anna University, Tiruchirappalli; India, 2009-11.
- iv) Member of the GIES-IMINT project review board in ADE, DRDO, Bangalore, 2004-2006.
- v) Member of the DRDO-RAC recruitment and Assessment Committee, DRDO (Delhi), since 2006.
- vi) Department (CS&E) faculty representative in the Institute Board of Academic Courses (*BAC member, Deptt. Of CS&E, IIT Madras*), since 2005-2007.
- vii) Department (CS&E) Faculty representative in the IIT time-table

committee from 2004-2007.

- viii) Department (CS&E) faculty representative in the Institute Board of Training and Placement (BT&P member, Deptt. Of CS&E, IIT Madras), since 2008.
 - ix) Appointed as the General Secretary of the Staff Club, IIT Madras, 2004-2006.
 - x) NPTEL (MHRD program) video lecture series in "Computer Graphics" (available in Doordarshan – Ekalvya Channel and now on Youtube), completed in Sept. 2005.
-

Brief Biodata

Dr. Sukhendu Das was born in 1962, in Kharagpur, W.B., India. He is currently working as an Associate Professor in the Deptt. Of Computer Science and Engg., IIT Madras, Chennai, India. He completed his B.Tech degree from IIT Kharagpur in the Deptt. Of Electrical Engg. in 1985 and M. Tech Degree in the area of Computer Technology from IIT Delhi in 1987. He then obtained his Ph.D degree from IIT Kharagpur in 1993. His current areas of research interests are: Visual Perception, Computer Vision: Digital Image Processing and Pattern Recognition, Computer Graphics, Artificial Neural Networks, Computational Science and engineering, and Soft Computing. Dr. Sukhendu Das has been a faculty of the Deptt. of CS&E, IIT Madras, INDIA since 1989. He has worked as a visiting scientist in the University of Applied Sciences, Pforzheim, Germany, for post-doctoral research work, from Dec. 2001 till May 2003; and in the Univ. of UWA, Perth Australia, during June-Aug. 2006, and July-Sept. 2008. He has guided one (currently guiding three) Ph.D student, 19 M.S (currently guiding eight), several M. Tech and B. Tech students. He had completed several international and national sponsored projects and consultancies, both as principle and co-investigators. Currently, he is involved in four (4) sponsored projects/consultancies in IIT Madras. He has published more than 90 technical papers in international and national journals and conferences. He has reviewed several papers in international journals (IEEE, Elsevier etc.) and chaired several sessions in conferences. He has received two best papers and a best design contest award.
