

Curriculum Vitae

1. *Name:* **SUMANTRA DUTTA ROY**
2. *Date of Birth:* 27th December, 1971
3. *Contact Information:* Department of Electrical Engineering,
I.I.T. Bombay, Powai, Mumbai - 400 076.
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4. *Educational Qualifications:*

B.E. (Computer Engg.)	D.I.T.	1993	University Topper in Engineering (all disciplines), Recipient of President's Gold Medal
M.Tech. (Comp. Sc. & Engg.)	I.I.T. Delhi	1995	C.G.P.A. 9.41 (on a scale of 10)
Ph.D. (Comp. Sc. & Engg.)	I.I.T. Delhi	2001	“Active Object Recognition through Next View Planning”

5. *Research Experience:*

I completed my Ph.D. at the Department of Computer Science and Engineering, I.I.T. Delhi immediately after my M.Tech. My field of interest is Computer Vision and the title of my Ph.D. thesis was '*Active Object Recognition through Next View Planning*'. Immediately after my Ph.D., I joined the Department of Electrical Engineering at I.I.T. Bombay, as an *Assistant Professor* (27 March 2001 - to date).

6. *Areas of Interest:*

Computer Vision and Image Processing, Pattern Recognition, Audio Data Retrieval and Analysis, Biometrics, Bioinformatics

7. *Topics of Current Research Activity:*

- Active 3-D Object Recognition
- Tracking and Gesture Analysis
- Image Mosaicing
- Audio Data Retrieval and Analysis
- Biometrics: Fingerprint Analysis
- Bioinformatics: Protein Structure Analysis

8. *Awards and Honours:*

- Awarded BOYSCAST Fellowship, 2004 - 2005 (Department of Science and Technology, Government of India).
- One of the 12 selected for the INAE Young Engineer Award, 2003 (Indian National Academy of Engineering).
- Project from the Naval Research Board, Government of India, Title of the Project: "Vision Based Activity Monitoring for Surveillance Applications"
No. NRB-73/SC/06-07
Total Cost: Rs. 61.76 lakhs, Duration: 3 years. (In progress)
- Project under the **SERC FAST TRACK PROPOSAL FOR YOUNG SCIENTISTS (2001-2002) - (ENGINEERING SCIENCES)** Science and Engineering Research Council, Department of Science and Technology. Title of the Project: "Automated Fingerprint Analysis and Recognition"
No. SR/FTP/ET-199/2001
Total Cost: Rs. 5.52 lakhs, Duration: 3 years. (Completed)
- **University Topper** in all branches of Engineering (COE, ECE, Mech, EE, ICE, Prod, Civil, D.C.E. + D.I.T) Delhi University, in B.E. Recipient of **President's Gold Medal** at D.I.T. Annual Convocation, 1994.

9. *Professional membership:*

- Member of the I.E.E.E. (Membership No. 40121994) since 1995
- Life Member of the I.E.T.E. (Membership No. M149744)

- Life Member of the I.S.T.E. (Membership No. LM35853)
- Life Member of the I.U.P.R.A.I

10. *Other Information:*

- Invited Lectures:
 - Microsoft Research, Redmond, Seattle, USA. (June 2001)
 - Dr. Babasaheb Ambedkar Technological University, Lonere. (September, 2001)
 - IEEE Students Section, IIT Bombay, DSP Week. (October, 2001)
 - School of Computer Engineering, Nanyang Technological University, Singapore. (June, 2002)
 - MGM College of Engineering. (2002)
 - Fr. Agnel: Father Conceicao Rodrigues Institute of Technology, Vashi, Mumbai. (May, 2003)
 - Gogte Institute of Technology, Belgaum. (May, 2003)
 - Simhagad College of Engineering, Pune. (June 2003)
 - INAE Young Engineer Awardee Lecture, INAE Annual Function, Chennai. (December, 2003)
 - Dr. Babasaheb Ambedkar Technological University, Lonere. (March, 2004)
 - IIT Bombay CEP Course on Role of Technology in Crime Prevention (November 2004)
 - Thadomal Shahani Engineering College, Mumbai (February, 2005)
 - Motorola Labs, Schaumberg Campus, Illinois, USA (September, 2005)
 - IIT Bombay CEP Course on Role of Technology in Crime Prevention (October 2005)
 - Jawaharlal Nehru Engineering College, Aurangabad (April, 2006)
 - Naval Research Board Workshop on Gesture Analysys and Tracking (April, 2006)

– Ramrao Adik Institute of Technology, Mumbai (July 2006)

- Reviewed papers for journals and conferences, including Artificial Intelligence; I.E.E.E. Transactions on Systems, Man and Cybernetics Part B; I.E.E.E. Transactions on Automation Science and Engineering; I.E.E.E. Transactions on Knowledge and Data Engineering; I.E.E.E. Transactions on Circuits and Systems for Video Technology; I.E.E.E. Signal Processing Letters; Pattern Recognition Letters; Pattern Analysis and Applications; EURASIP Journal on Applied Signal Processing; The I.E.E.E. International Conference on Computer Vision (ICCV); I.E.T.E. Journal of Research; I.E.E.E. Tencon; The I.E.E.E. International Symposium on Circuits and Systems (ISCAS); The I.E.E.E. Workshop on Applications of Computer Vision (WACV); The IAPR-sponsored International Conference on Pattern Recognition (ICPR); The IAPR-sponsored Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP); International Conference on Advances in Pattern Recognition (ICAPR); The Asian Conference on Computer Vision (ACCV); The European Signal Processing Conference (EUSIPCO); The I.E.E.E. and IAPR-sponsored Digital Image Computing: Techniques and Applications (DICTA); The I.E.E.E. International Conference on Advanced Computing and Communications (ADCOM); National Conference on Communications (NCC); International Conference on Information Technology (CIT); The International Fall Workshop on Vision, Modeling, and Visualization (VMV) (co-sponsored by the I.E.E.E. Signal Processing Society); Asian Applied Computing Conference (AACC); Workshop on Computer Vision, Graphics and Image Processing (WCVGIP), India.
- Have been on the Program Committee of the The IAPR-sponsored International Conference on Pattern Recognition (ICPR) 2004, 2006. The I.E.E.E. International Conference on Computer Vision (ICCV) 2005, The IAPR-sponsored Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP) 2004, 2006, and The I.E.E.E. Workshop on Applications of Computer Vision (WACV) 2002
- International Conferences Attended:
 1. IEEE Computer Society International Conference on Computer Vision and Pattern Recognition (CVPR) 2005.

- 2. IEEE International Conference on Image Processing (ICIP) 2004.
- 3. IEEE International Conference on Computer Vision (ICCV) 1998, 2001.
- 4. Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP) 1998, 2000, 2002, 2004.
- 5. International Symposium on Intelligent Robotic Systems (ISIRS) 1998.
- 6. Indian Conference on Pattern Recognition, Image Processing and Computer Vision (ICPIC) 1995.
- National Conferences Attended:
 - 1. National Conference on Communications (NCC) 2002, 2003, 2004, 2005, 2006.
 - 2. Workshop on Computer Vision, Graphics and Image Processing (WVGIP) Madurai, 2002.
- Hobbies include Sketching and Painting, and Playing the Flute.

10. *Courses Taught:*

- EE610: Image Processing (Autumn Semester 2004 - 2005, 2001 - 2002)
- EE206: Digital Circuits (Spring Semester 2005 - 2006, 2004 - 2005, 2003 - 2004, 2002 - 2003, 2001 - 2002)
- IT602: Multimedia Systems (co-taught at the Kanwal Rekhi School of Information Technology, I.I.T. Bombay) (Spring Semester 2002 - 2003)
- EE309: Computer Organization, Architecture and Microprocessors (Originally, Microprocessors) (Autumn Semester 2003 - 2004, 2002 - 2003)
- EE315: Microprocessors Lab (co-taught) (Autumn Semester 2003 - 2004)
- EE443: Digital Signal Processing Lab (co-taught) (Spring Semester 2005 - 2006)

Sumantra Dutta Roy: List of Publications

Journal Publications:

- K. S. Patwardhan, S. Dutta Roy.
“Hand Gesture Modeling and Recognition involving Changing Shapes and Trajectories, using a Predictive EigenTracker.” *Pattern Recognition Letters*, (Accepted for publication, January 2006).
- S. Dutta Roy, S. Chaudhury, and S. Banerjee.
“Recognizing Large Isolated 3-D Objects through Next View Planning using Inner Camera Invariants.”
IEEE Transactions on Systems, Man and Cybernetics - Part B: Cybernetics, vol. 35, no. 2, pp. 282 – 292, April, 2005.
- U. Bhosle, S. Dutta Roy, S. Chaudhuri.
“Multispectral Panoramic Mosaicing.”
Pattern Recognition Letters, vol. 26, no. 4, pp. 471 – 482, March 2005.
- S. Dutta Roy, S. Chaudhury, and S. Banerjee.
“Active Recognition through Next View Planning: A Survey.”
Pattern Recognition, vol. 37, no. 3, pp. 429 – 446, March 2004.
- S. Dutta Roy, S. Chaudhury, and S. Banerjee.
“Aspect Graph Construction with Noisy Feature Detectors.”
IEEE Transactions on Systems, Man and Cybernetics - Part B: Cybernetics, vol. 33, no. 2, pp. 340 – 351, April 2003.
- N. Gupta, P. Mittal, S. Dutta Roy, S. Chaudhury, and S. Banerjee.
“Developing a Gesture-based Interface.”
IETE Journal of Research, vol. 48, nos. 3 and 4: *Special Issue on Visual Media Processing*, pp. 237 – 244, May - August 2002.
- U. Bhosle, S. Chaudhuri, S. Dutta Roy.
“A Fast Method for Image Mosaicing using Geometric Hashing.”
IETE Journal of Research, vol. 48, nos. 3 and 4: *Special Issue on Visual Media Processing*, pp. 317 – 324, May - August 2002.

- S. Dutta Roy, S. Chaudhury, and S. Banerjee.
“Aspect Graph Based Modeling and Recognition with an Active Sensor: A Robust Approach.”
Proc. Indian National Science Academy (INSA) Part A, Special Issue on Image Processing, Vision and Pattern Recognition,
vol. 67, no. 2, pp. 187 – 206, March 2001.
- S. Dutta Roy, S. Chaudhury, and S. Banerjee.
“Isolated 3D Object Recognition through Next View Planning.”
IEEE Transactions on Systems, Man and Cybernetics - Part A: Systems and Humans,
vol. 30, no. 1, pp. 67 – 76, January 2000.

Book Chapters and Refereed Conference Papers:

- P. Kumar, M. Joshi, S. Hariharan, S. Dutta Roy, P. Rao.
“Sung Note Segmentation for a Query-by-Humming System.”
In *Proc. International Workshop on Artificial Intelligence and Music (in conjunction with the International Joint Conference on Artificial Intelligence (IJCAI))*, 2007. (Accepted for Presentation).
- V. Srikrishnan, S. Chaudhuri, S. Dutta Roy.
“Stabilisation of Active Contours using Tangential Evolution: An Application to Tracking.”
In *Proc. International Conference on Computing: Theory and Applications (ICCTA)*, 2007. (Accepted for Presentation).
- S. Dutta Roy, P. Rao, R. Bhargava.
“Optimal Parameter Estimation and Performance Modelling in Melodic Contour-Based QBH Systems.”
In *Proc. National Conference on Communications (NCC)*, pp. 199 – 202, 2006.
- S. Dutta Roy, P. Rao, A. S. Galinde, R. Bhargava.
“Melodic Contour-Based QBH Systems: Analytical Modeling and Performance Evaluation.”
In *Proc. National Conference on Communications (NCC)*, pp. 475 – 479, 2005.
- S. Dutta Roy, N. Kulkarni.
“Active 3-D Object Recognition using Appearance-Based Aspect Graphs.”

In *Proc. IAPR-sponsored Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP)*, pp. 40 – 45, 2004.

- K. S. Patwardhan, S. Dutta Roy.
“Dynamic Hand Gesture Recognition using Predictive EigenTracker.”
In *Proc. IAPR-sponsored Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP)*, pp. 675 – 680, 2004.
- R. Boro, S. Dutta Roy.
“Fast and Robust Projective Matching for Fingerprints using Geometric Hashing.”
In *Proc. IAPR-sponsored Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP)*, pp. 681 – 686, 2004.
- P. Madhusoodhanan, S. Dutta Roy.
“Robust Fingerprint Classification using an Eigen Block Directional Approach.”
In *Proc. IAPR-sponsored Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP)*, pp. 605 – 610, 2004.
- N. Gupta, P. Mittal, K. S. Patwardhan, S. Dutta Roy, S. Chaudhury, and S. Banerjee.
“On-line Predictive Appearance-based Tracking.”
In *Proc. IEEE International Conference on Image Processing (ICIP)*, pp. 1041 – 1044. 2004.
- K. A. Barhate, K. S. Patwardhan, S. Dutta Roy, S. Chaudhuri, and S. Chaudhury.
“Robust Shape Based Two Hand Tracker.”
In *Proc. IEEE International Conference on Image Processing (ICIP)*, pp. 1017 – 1020, 2004.
- K. A. Barhate, K. S. Patwardhan, S. Dutta Roy, S. Chaudhuri, and S. Chaudhury.
“Robust Two Hand Tracker using Predictive EigenTracking.”
In *Proc. National Conference on Communications (NCC)*, pp. 101 – 105, 2004.
- S. Dutta Roy, P. Rao, and A. S. Galinde. “Contour-Based Melody Representation: An Analytical Study.”

In *Proc. National Conference on Communications (NCC)*, pp. 536 – 540, 2004.

- U. Bhosle, S. Dutta Roy, and S. Chaudhuri.
“Multispectral Panoramic Mosaicing.”
In *Proc. International Conference on Advances in Pattern Recognition (ICAPR)*, pp. 188 – 191, 2003.
- V. Deodeshmukh, S. Chaudhuri, S. Dutta Roy.
“Cooperative Infrared and Visible Band Tracking.” In *Proc. International Conference on Advances in Pattern Recognition (ICAPR)*, pp. 402 – 405, 2003.
- U. Bhosle, S. Chaudhuri, and S. Dutta Roy.
“Background Mosaicing for Scenes with Moving Objects.”
In *Proc. National Conference on Communications (NCC)*, pp. 85 – 89, 2003.
- N. Gupta, P. Mittal, S. Dutta Roy, S. Chaudhury, S. Banerjee.
“CONDENSATION-based Predictive EigenTracking.”
In *Proc. IAPR-sponsored Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP)*, pp. 49 – 54, 2002.
- U. Bhosle, S. Chaudhuri, and S. Dutta Roy.
“The Use of Geometric Hashing for Automatic Image Mosaicing.”
In *Proc. National Conference on Communications (NCC)*, pp. 533 – 537, 2002.
- N. Gupta, P. Mittal, S. Dutta Roy, S. Chaudhury, S. Banerjee.
“A Predictive Scheme for Appearance-based Hand Tracking.”
In *Proc. National Conference on Communications (NCC)*, pp. 513 – 522, 2002.
- S. Dutta Roy, S. Chaudhury, and S. Banerjee.
“Recognizing Large 3-D Objects through Next View Planning using an Uncalibrated Camera.”
In *Proc. IEEE International Conference on Computer Vision (ICCV)*, IEEE Computer Press, pp. II: 276 – 281, 2001.

- S. Dutta Roy, S. Chaudhury, and S. Banerjee.
“Part-based Isolated 3-D Object Recognition through Next View Planning using Inner Camera Invariants.”
In *Proc. Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP)*, pp. 87 – 94, 2000.
- M. Werman, S. Banerjee, S. Dutta Roy and M. Qiu.
“Robot Localization Using Uncalibrated Camera Invariants.”
In *Proc. IEEE International Conference on Computer Vision and Pattern Recognition (CVPR)*, IEEE Computer Press, pp. II: 353 – 359, 1999.
- S. Dutta Roy, S. Chaudhury, and S. Banerjee.
“Aspect Graph Construction with Noisy Feature Detectors.”
In *Computer Vision, Graphics and Image Processing: Recent Advances*, S. Chaudhury and S. K. Nayar (Eds.), Viva Books Private Limited, pp. 166 – 172, 1999.
- S. Dutta Roy, S. Chaudhury, and S. Banerjee.
“Isolated 3D Object Recognition through Next View Planning.”
In *Intelligent Robotic Systems*, M. Vidyasagar (Ed.), Tata McGraw-Hill Publishing Company Limited, New Delhi, pp. 494 – 501, 1998.
- S. Dutta Roy, S. Chaudhury, and S. Banerjee.
“3D Object Recognition through Next View Planning.”
In *Pattern Recognition, Image Processing and Computer Vision: Recent Advances*, P. P. Das and B. N. Chatterji (Eds.), Narosa Publishing House, pp. 241 – 246, 1996.

Technical Magazine and Newsletter Articles:

- S. Dutta Roy.
“Active 3-D Object Recognition through Next View Planning.”
{Invited article}
IEEE Systems, Man and Cybernetics (SMC) eNewsletter, June 2005.
<http://www.ieeesmc.org/announcements/Newsletter/June2005/ROY.php>