

ANNUAL REPORT FOR 2003-2004

1. Books and Book-Chapters published

1. Laxmidhar Behera, Parametric Optimization of a Fuzzy Logic Controller for Nonlinear Dynamical Systems using Evolutionary Computation, in **NEW OPTIMIZATION TECHNIQUES IN ENGINEERING**, Springer Verlag, 2004, Chapter 19, pp. 479-500.
2. Y.N. Singh, Lecture Notes on Digital Switching – Electronic Book distributed via Web.
3. S. Kar, M. Houssa, H. Iwai, D. Landheer, M. Morais, R. Singh, and D. Misra, Editors, **Physics and Technology of High-K Gate Dielectrics -II**, PV 2003-22; The Electrochemical Society Proceedings Series, Pennington, NJ (2003).

2. Research Papers Published in Journals and Conference Proceedings.

Journals

- (1) M. Sachidananda and D.S. Zrnica, "Unambiguous range extension by overlay reduction in **staggued** PRT Techniques" *Journal of Amorphous and Organic Technology*, vol. 20, May 2003, pp. 673-684.
- (2) Satyendra Kumar, AK Biswas, VK Shukla, A. Awasthi, **RS Anand** & J. Narain, Jr. of Synthetic Metals, vol. 139, 2003, pp. 751-753.
- (3) A.K.Srivastava, Ram M.Shrestha, S.C.Srivastava, Rabin Shrestha, and Dharam Paul, "*Power Sector Development in India with CO₂ Emission Targets: Effects of Regional Grid Integration and the Role of Clean Technologies*", *International Journal of Energy Research*, Vol. 27, 2003, pp. 671-685.
- (4) Ashwani Kumar, SC Srivastava and SN Singh, "*A Zonal Congestion Management Approach Using Real and Reactive Power Rescheduling*", *IEEE Trans. on Power Systems*, Vol.19, No.1, Feb.2004, pp. 554-562.
- (5) Ashwani Kumar, SC Srivastava and SN Singh, "*Available Transfer Capability Assessment in a Competitive Electricity Market using Bifurcation Approach*", Accepted for publication in the IEE Proceedings Part-C on 'Generation, Transmission and Distribution' Vol.151, Issue 02, March 2004.
- (6) Laxmidhar Behera and Frank Schweitzer, On spatial consensus formation: Is the Sznajd model different from a voter model, *Int. Journal of Modern Physics, Part C*, 14(10), 2003 (<http://arxiv.org/abs/condmat/0306576>)
- (7) Laxmidhar Behera, Query based model learning and stable tracking of a robot arm using radial basis function network, *Computers and Electrical Engineering* 29 (2003) 553-573.
- (8) M. K. Mishra, A. Joshi and A. Ghosh, "Control schemes for equalization of capacitor voltages in neutral clamped shunt compensator," *IEEE Trans. Power Delivery*, Vol. 18, No. 2, pp. 538-544, 2003.
- (9) N. K. Sharma, A. Ghosh and R. K. Varma, "A novel placement strategy for FACTS controllers," *IEEE Trans. Power Delivery*, Vol. 18, No. 3, pp. 982-987, 2003.
- (10) G. N. Pillai, A. Ghosh and A. Joshi, "Torsional interaction studies on a power system compensated by SSSC and fixed capacitor," *IEEE Trans. Power Delivery*, Vol. 18, No. 3, pp. 988-993, 2003.
- (11) A. Ghosh and G. Ledwich, "Load compensating DSTATCOM in weak ac systems," *IEEE Trans. Power Delivery*, Vol. 18, No. 4, pp. 1302-1309, 2003.

- (12) A Ghosh, A. K. Jindal and A. Joshi, "Design of a capacitor supported dynamic voltage restorer (DVR) for unbalanced and distorted loads," *IEEE Trans. Power Delivery*, Vol. 19, No. 1, pp. 405-413, 2004.
- (13) M. Basu, S. P. Das, and G. K. Dubey, "New parallel converter scheme for high power active power filters," To appear in the coming issue of IEE Proceedings (In Press).
- (14) SN Singh, *A Practical Approach to Teach Power System Transients into the Electrical Engineering Curriculum*, International Journal of Electrical Engineering Education, UK, Vol. 40, No.2, April 2003, pp. 144-157.
- (15) SN Singh and AK David, *Congestion Management in Dynamic Security Constrained Open Power Markets*, International Journal of Computer and Electrical Engineering, Vol. 29, No. 5, July 2003, pp. 575-588.
- (16) L Srivastava, SN Singh and J Sharma, *Parallel Self-Organising Hierarchical Neural Network based Estimation of Degree of Voltage Insecurity*, International Journal of Computer and Electrical Engineering, Vol. 29, No. 5, July 2003, pp. 589-602.
- (17) T Jain, L Srivastava and SN Singh, *Fast Voltage Contingency Screening using Radial Basis Function Neural Network*, IEEE Trans. on Power Systems, Vol. 18, No. 4, November 2003, pp. 1359-1366.
- (18) Sachchidanand and R. P. Gupta, *"Technology Development for Power Distribution Automation"*, BEACON, IEEE Delhi Section Journal, Vol. 21, No. 1, P. 26, June 2002.
- (19) Anjan K. Ghosh and Kopinesh Patil, "The Radiation of Light from Laser Machined Taps on Optical Fibers", IETE Journal of Research, vol. 49, pp. 359-364, Nov.-Dec. 2003.
- (20) Nandini Gupta, WW Stoffels and G. Kroesen, "Numerical Simulation of primary cluster formation in silane plasmas, Jr. of Physics D: applied Physics, 36(2003), pp. 837-841.

Conferences

- (1) B. Mazhari and Yogesh S. Chauhan, 'A new negative feedback based Poly-Silicon AMOLED pixel circuit with highly linear transfer characteristics,' proceedings, 10th International Display workshops, Fukuoka, 2003.
- (2) B. Mazhari and Yogesh S. Chauhan, 'Design of current programmed amorphous silicon AMOLED pixel circuit,' proceedings, 8th Asian Symposium on information display, Nanjing, China, 2004.
- (3) B. Mazhari and M. Tewari, 'Crosstalk in passive matrix OLED displays with single integrated organic FET ,' proceedings, 8th Asian Symposium on information display, Nanjing, China, 2004.
- (4) S. Nagar and B. Mazhari, ' A new approach to topology selection for cell level analog circuits,' proceedings, 17th International conference on VLSI design, Mumbai, 2004.
- (5) Barjeev Tyagi and S.C. Srivastava, "*A Fuzzy Logic Based Load Frequency Controller petitive Electricity Environment*", Proc. Of the IEEE Power Engineering Society General Meeting 2003, Toronto Canada, 13-18 July, 2003.
- (6) Ashwani Kumar, S.C. Srivastava and S.N. Singh, "*Zonal Congestion Management using Phase Angle Regulators*", Proc. of the International Conference on 'Intelligent System Application to Power Systems (ISAP2003)', Lemnos, Greece, 1-5 August 2003.
- (7) M.K. Varma and S.C. Srivastava, "*Voltage Stability Based Contingency Ranking Considering Post-Contingency Var Requirement*", Proc. of the IASTED International Conference on 'European Power & Energy Systems (Euro-PES 2003), Marbella, Spain, 3-5 September 2003.
- (8) R.P. Gupta, Sachchidanand and S.C. Srivastava, "*Automated Versus Conventional Distribution System*", Proc. of the IASTED International Conference on 'European Power & Energy Systems (Euro-PES 2003), Marbella, Spain, 3-5 September 2003.
- (9) N.Satish and S.C. Srivastava, "*Impact of FACTS Controllers on System Loadability and Transmission System Available Transfer Capability*", Accepted for presentation and publication in the Proc. of Int. Conference on 'Electric Supply Industry in Transition: Issues and Prospects for Asia' at Asian Institute of Technology, Thailand, 14-16 January 2004.

- (10) B. Kalyan Kumar, S.N. Singh and S.C. Srivastava, 'Optimal Control Strategy Using Pseudo-Decentralization for Coordination of Power System Stabilizer and FACTS in a Multi-machine System', Accepted for presentation and publication in the Proc. of Int. Conference on 'Electric Supply Industry in Transition: Issues and Prospects for Asia' at Asian Institute of Technology, Thailand, 14-16 January 2004.
- (11) Laxmidhar Behera and Indrani Kar, Recurrent quantum Neural Networks – A New Approach to Cognitive Modeling, Int Conf Systemics, Cybernetics and Informatics, ICSCI-04, Feb, Hyderabad.
- (12) Indrani Kar and Laxmidhar Behera, Adaptive control of robot manipulators using Quantum neural networks, International Conference on Intelligent Signal Processing and Robotics, ISPR-04, Feb, Allahabad.
- (13) Laxmidhar Behera, Swagat Kumar and Awhan Patnaik, A novel learning algorithm for feedforward networks using Lyapunov function approach, Proceedings Int. Conf. Int. Sensors and Inf. Processing, ICISIP-2004, Chennai, 277-282.
- (14) Laxmidhar Behera and Bharat Sundaram, Stochastic filtering and and Speech Enhancement using a Recurrent Quantum Neural Network, Proceedings Int. Conf. Int. Sensors and Inf. Processing, ICISIP-2004, Chennai, 165-170.
- (15) Laxmidhar Behera, Macroscopic analysis of stochastic cellular automata, Proceedings, Int. Conf on information Technology, 2003, 267-274, Bhubaneswar.
- (16) Nimit Kumar and Laxmidhar Behera, A Quantum Clustering algorithm for Visual motor coordination, Proceedings, ICAPR, 2003, Calcutta
- (17) Debashis Dash, Rishi Dhingra and Laxmidhar Behera, Approaches to fragment assembly for DNA sequencing, Proceedings, HiPC Workshop on Soft Computing, 2003, 116-131, Hyderabad.
- (18) Laxmidhar Behera, Bharat Sundaram and Gaurav Singhal, Speech enhancement using a recurrent quantum neural network, Proceedings, Indian International Conference on Artificial Intelligence, IICAI-2003, Hyderabad, India.
- (19) Laxmidhar Behera, Swagat Kumar and Subhas Das, Identification of non-linear dynamical systems using recurrent neural networks, TENCON, 2003, Bangalore
- (20) A. Ghosh, A. K. Jindal and A. Joshi, 'Operation and control of a DSTATCOM in the presence of non-integer harmonics,' *Proc. IEEE Asia-Pacific Region-10 Conference TENCON*, pp. 43-47, Bangalore, October 2003.

- (21) A Ghosh, A. K. Jindal and A. Joshi, "Inverter control using output feedback for power compensating devices," *Proc. IEEE Asia-Pacific Region-10 Conference TENCON*, pp. 49-52, Bangalore, October 2003.
- (22) A. Ghosh, A. K. Jindal and A. Joshi, "The operation of dynamic voltage restorer (DVR) using output feedback control," *Proc. 27th National Systems Conference (NSC-2003)*, pp. 319-323, IIT Kharagpur, December 2003.
- (23) K. Vasudevanand BK Rai, Predictive Iterative Decoding of Turbo Codes in Coloured Gaussian Nouis, *Proc. NCC'04*, pp. 308 -312.
- (24) S. Behera, S. P. Das, and S. R. Doradla, "A Novel Soft-Switching Quasi-Resonant Inverter for Variable Power Factor Load," *Conf. Proceeding of National Power Electronics Conference (NPEC 2003)*, IIT Bombay, pp. 246-252, Oct. 2003.
- (25) Y. Y. Kolhatkar and S. P. Das, "An Improved DVR with Optimum Series Voltage Injection for Minimum VA Requirement of UPQC," *Conf. Proceedings of National Systems Conference (NSC 2003)*, IIT Kharagpur, pp. 324-327, Dec. 2003.
- (26) T. Jain, L. Srivastava and S.N. Singh, *Feature Selection Techniques for Voltage Contingency Ranking using RBFN*, Proceedings of Conference on Services through I.T. Enabled Systems (SITES-2003) Gwalior, April 19-20, 2003, pp 175-180.
- (27) T. Jain, L. Srivastava and S.N. Singh, *Voltage Security Assessment Unsupervised and Unsupervised Learning*, Proceedings of All India Jamia Electrical Conference 2003, Jamia Millia Islamia, New Delhi, August 16-17, 2003.
- (28) JG Singh and SN Singh, *Optimal Power Flow Control Using Generalized Unified Power Flow Controller*, National Conference on Modern aspect of FACTS and its Applications at Coimbatore, August 29-30, 2003, pp. 89-97.
- (29) SN Singh, *Future of FACTS Controllers in Restructured Power System*, National Conference on Modern aspect of FACTS and its Applications at Coimbatore, August 29-30, 2003, pp. I-XI.
- (30) T Jain, L Srivastava and SN Singh, *Fast Voltage Estimation Using Parallel Radial Basis Function Neural Network*, International Conference on Electric Supply Industry in Transition: Issues and Prospect for Asia, during 14-16 January 2004, AIT Bangkok, pp. 8-10:8-18.
- (31) S.K Srivastava, K. G. Upadhyay, S. Khalid and S.N. Singh, *Simulink Based d-q Axis Model of Unified Power Flow Controller*, National Conference on Control, Communication and Information Systems (CCIS2004), Goa, January 23-24, 2004.

- (32) S. Kar, "Extraction of the Capacitance of Ultrathin High-K Gate Dielectrics", IEEE Trans. Electron Devices 50, pp. 2112-2119(2003).
- (33) T. Kachru, R. Singh, M. Bhagat, and S. Kar, "Experimental Values of a Quantization Index of the Accumulation Layers of Different High-K Gate Dielectrics," in *Physics and Technology of High-K Gate Dielectrics - II*, S. Kar, M. Houssa, H. Iwai, D. Landheer, M. Morais, R. Singh, and D. Misra, Editors, PV 2003-22, The Electrochemical Society Proceedings Series, Pennington, NJ (2003), pp. 143-151. Also presented at the Second International Symposium on High Dielectric Constant Materials: Materials Science, Processing, Manufacturing, and Reliability Issues, Orlando, Florida, 12-16 Oct 2003.
- (34) S. Kar, "Extraction of the High-K Gate Dielectric Parameters from the Capacitance Data," in *Physics and Technology of High-K Gate Dielectrics - II*, S. Kar, M. Houssa, H. Iwai, D. Landheer, M. Morais, R. Singh, and D. Misra, Editors, PV 2003-22, The Electrochemical Society Proceedings Series, Pennington, NJ (2003), pp. 373-384. Also presented at the Second International Symposium on High Dielectric Constant Materials: Materials Science, Processing, Manufacturing, and Reliability Issues, Orlando, Florida, 12-16 Oct 2003.
- (35) S. Kar, "Extraction of Parameters of High-K Gate Dielectrics", in *Physics of Semiconductor Devices*, K. N. Bhat and A. DasGupta, Editors, IWPSD-2003, pp. 414-419, Narosa Publishing House, New Delhi (2003). Also presented at the Twelfth International Workshop on the Physics of Semiconductor Devices, Chennai, 16-20 Dec 2003.
- (36) A.R. Harish and T. Mittal, "Propagation measurements and characterization for wireless LAN applications", National Symposium on advances in microwaves and lightwares, Oct. 2003, New Delhi, pp.41 – 44
- (37) A.R. Harish, "Neural network based yield prediction of microwave filters", Asia-Pacific Conference on Applied Electromagnetics (APACE), Kuala Lumpur, Malaysia, Aug 2003.
- (38) A.R. Harish and M. Sachidananda, "Compact tapered slot antenna", Proceedings of International radar symposium India 2003, Bangalore, India, 02-05 Dec 2003.
- (39) A. Sivabalan, Joseph John, "Effect of Multiple Transmitters on the Power Distribution in Indoor Optical Wireless Systems", *Proceedings of the Tenth National Conference on Communications (NCC-2004)*, Jan 30-Feb 1, 2004, Indian Institute of Science, Bangalore, pp.572-576.
- (40) R. Tripathi and **Joseph John**, "Experimental Realization of DPPM for Power Efficient Optical Wireless Systems", *Proceedings of the Tenth National Conference on Communications (NCC-2004)*, Jan 30-Feb 1, 2004, Indian Institute of Science, Bangalore, pp.336-340.

- (41) A.Sivabalan and **Joseph John** ‘Power Distribution of Diffuse Indoor Optical Wireless Systems Considering Multiple Sources and Multiple Reflections’, , *Second International Conference on Optical Communications & Networks, (ICOCON 2003)* Bangalore, India, October 20-22, 2003, Paper ID:2041.
- (42) A.Sivabalan, **Joseph John** ‘Modeling and Simulation of Indoor Optical Wireless Channels: A Review’, , *Convergent Technologies for the Asia-Pacific, IEEE TENCON 2003*, Bangalore, India, Oct.14-17, 2003.
- (43) Chaturi Singh, **Joseph John**, Y.N.Singh, K.K.Tripathi ‘High-Capacity Indoor Optical Wireless LAN Architecture’, *Convergent Technologies for the Asia-Pacific, IEEE TENCON 2003*, Bangalore, India, Oct.14-17, 2003.
- (44) Anjan K. Ghosh, ‘Optical processing of signals in surface plasmon resonance based opticalbio-sensors’, in Proc. Of SPIE, vol. 5202 Optical Information Systems, edited by B. Javidi & D. Psaltis, SPIE, Bellingham, WA, USA, 2003, pp. 192-200.
- (45) Anjan K. Ghosh, ‘Effects of Misalignments in Packaging of Array based Optical Interconnects and Processors’, Proc. Of SPIE, vol. 5202 Optical Information Systems, edited by B. Javidi & D. Psaltis, SPIE, Bellingham, WA, USA, 2003, pp. 276-286.
- (46) Anjan K. Ghosh, ‘Surface Plasmon resonance based optical biosmors “invited talk in National symp. On Engineering Optics, Meerut, April 2003, Paper appears in Perspectives in Engg. Optics, ed. Kehar Singh and VK Rastogi, Anita Publications, New Delhi, pp. 57-65, April, 2003.
- (47) S. Qureshi & M.K. Suaidi, ‘Establishing Chip Design Activities in Malaysia : Role of Malaysian Universities’, Proceedings of Engineering Technology Conference, EnTech 2003 held on July 31-Aug 2003, Kuching, Malaysia.
- (48) R. P. Gupta, Sachchidanand and R. K. Varma, “**Novel Software Architecture for Power Distribution Automation**”, *Proceedings of IEEE Power Engineering Society General Meeting*, Toronto, Ontario, Canada, July 13-17, 2003.
- (49) R. P. Gupta, and A. Khastagir, "**Web Based Energy Audit and Accounting Software for Power Distribution Utilities**", *Proceedings of the International Conference on Electric Supply Industry in Transition: Issues and Prospects*, Asian Institute of Technology, Thailand, January 14-16, 2004, pp. 9/26-37.

- (50) R. P. Gupta, and N. Srivastava, "**Substation Automation Communication Protocol**", *Proceedings of the International Conference on Systemics, Cybernetics and Informatics (ICSCI-2004)*, Pentagram Research Center Pvt. Ltd., Hyderabad, India, February 12-15, 2004, pp. 499-503.
- (51) R. P. Gupta and Mitali Pandey, "**A Comparative Study of IEC61850 Communication Protocol with DNP3.0 and UCA2.0**", *Proceedings of National Workshop on Communication Protocol for Power System Automation*, Central Power Research Institute, Bangalore, India, January 22-23, 2004, pp. IV / 1-6.
- (52) R. P. Gupta and A. Singh, "**Web Based Monitoring of Power Distribution System**", *Proceedings of Seminar on Power System Data Repository and Load Research*, Organized by Central Power Research Institute, Bangalore, India, November 20-21, 2003, pp. TS-V / 42-48.
- (53) R. P. Gupta and S. C. Srivastava, "**Development of Power Distribution Automation System**", *Proceedings of Seminar on Power System Data Repository and Load Research*, Organized by Central Power Research Institute, Bangalore, India, November 20-21, 2003, pp. TS-V / 34-41.
- (54) R. P. Gupta, "**Remote Terminal Units (RTU) and Data Communication for Distribution Automation System**", *Proceedings of Workshop on Demand Side Management and Distribution Automation*, Asian Institute of Technology, Bangkok, Thailand, August 20-22, 2003.
- (55) R. P. Gupta, "**Master Distribution Automation Software and Open Architecture**", *Proceedings of Workshop on Demand Side Management and Distribution Automation*, Asian Institute of Technology, Bangkok, Thailand, August 20-22, 2003.
- (56) R. P. Gupta, "**Sensors and Instrumentation for Distribution Automation System**", *Proceedings of Workshop on Demand Side Management and Distribution Automation*, Asian Institute of Technology, Bangkok, Thailand, August 20-22, 2003.
- (57) R. P. Gupta, "**Power Distribution Automation Developed at IIT Kanpur**", *Proceedings of Workshop-cum-Technology Dedication of Power Distribution Automation*, Indian Institute of Technology Kanpur, India, February 22-23, 2003.

- (58) R. P. Gupta, "**Substation Automation: Data Communication Issues**", *The International Conference on Planning and Operation of Reliable Distribution Systems*, Organized by Council of Power Utilities, Delhi, India, April 15-16, 2004 (*communicated*).
- (59) RN Sharma, AK Chaturvedi, and G Sharma, "Acoustic Echo Cancellation using Multiple Sub-Filters," Proceedings IEEE TENCON 2003, pp. 393-396, Oct 2003, Bangalore.
- (60) R Subudhi and AK Chaturvedi, "A Novel Interleaver Design for Use in Turbo-SPC Codes," Proceedings Tenth National Conference on Communications, pp. 313-316, Jan 2004, IISc, Bangalore.
- (61) R Agarwal, AK Chaturvedi, F Tufvesson and P Almers, "A Simulation Study on Modeling the MIMO Propagation Channel Using the 3GPP/3GPP2 Spatial Channel Model," Proceedings Tenth National Conference on Communications, pp. 390-394, Jan 2004, IISc, Bangalore.
- (62) K Mehrotra, A Jindal and AK Chaturvedi, "A Novel Scheme for Capacity Enhancement in DS-CDMA Systems," 2003 WNCG Wireless networking Symposium Oct 2003, University of Texas, Austin.

3. Seminars Presented:

- (1) P. Sensarma, "Harmonic Currents in a Distribution system", National Workshop on Custom Power, IISc. & ERDC(I), June 13, 2003.
- (2) R.S. Anand, "Reverse Leakage Current in Polymer Light emitting Diodes", Workshop on Organic Electronics held at IIT Kanpur, Oct. 14-17, 2003.
- (3) S.C. Srivastava, Resource person to the workshops organized at AIT Bangkok, Thailand on 'Demand Side management and Distribution Automation', during 20-22 August 2003.
- (4) A training programme on 'Power System Operation Automation & Management' during 1-19 December 2003.
- (5) SC Srivastava delivered invited lectures in the 'POWERFEST 2003' conference during 28-29 November 2003 at National Institute of Technology Kurukshetra on 'Power System Restructuring'.
- (6) Laxmidhar Behera, Evolution of Neural Networks from Artificial to Real, Invited Talk, International Conference on Information Technology, CIT 2003, Bhubaneswar
- (7) Laxmidhar Behera, Recurrent Quantum Neural Networks – A New Approach to Cognitive Modeling, Invited Lecture, International Conference on Intelligent Signal Processing and Robotics, ISPR-04, IIT, Allahabad.
- (8) Arindam Ghosh presented a ten and a half hours lecture series titled "Power Electronics Applications in Power Systems" during June 23-26, 2003, as a part of the prestigious Grainger Lecture Series at the University of Illinois at Urbana-Champaign in cooperation with the Power Systems Engineering Research Center, University of Wisconsin at Madison. The lecture slides and audio can be obtained from the web site
- (9) K. Vasudevan presented a seminar on "Optimal Predictive Iterative Decoding of Turbo Codes in Coloured Gaussian Noise" invited by IETE on 29.02.2004 at IIT Kanpur.
- (10) Alope Dutta presented a seminar on RF MOSFET, I.I.T. Kanpur, October 20, 2003.
- (11) Alope Dutta presented a seminar on Overview of RF Circuit Design, IIT Kanpur, Feb. 19, 2004.
- (12) S.P. Das delivered an invited lecture "Modern Trends in Power Electronics" in HBTI, Kanpur, Feb. 2004 during TechEra 2004.

- (13) S. Das delivered a seminar entitled "UPQC-Q for Power Distribution System" on 13th Dec. 2003 at IIT Madras, Chennai.
- (14) S. N. Singh presented the seminar of Rural Elect and Distributed Gen. for Sustainable Development (Four lectures), AIT Thailand, July 9-10, 2003
- (15) S. N. Singh presented the seminar of Power System Restructuring: An Introduction, PSG Tech. Coimbatore, August 28, 2003.
- (16) S. N. Singh presented the seminar of Future of FACTS Controllers in Restructured Power System, KCT, Coimbatore, August 29, 2003.
- (17) S. N. Singh presented the seminar of Challenges for Electricity Generating Utilities in the Context of Restructuring, IIM Lucknow, Sept. 29, 2003.
- (18) S. N. Singh presented the seminar of Fundamental of Power System Deregulation, BVCOE, Pune Oct. 16-17, 2003
- (19) S. N. Singh presented the seminar of Role of FACTS Controllers in Competitive Power Market, BVCOE, Pune, Oct. 16-17, 2003.
- (20) S. N. Singh presented the seminar of Power System Operation, Automation & Deregulation (15 Lectures), AIT Bangkok, Nov. 29-Dec. 19, 2003
- (21) S. N. Singh presented the seminar of Artificial Neural Network: An Introduction, MITS, Gwalior, January 19, 2004.
- (22) Power System Restructuring: An Introduction, MITS, Gwalior, January 19, 2004
- (23) S. N. Singh presented the seminar of Evolutionary Computation, MITS, Gwalior, January 19, 2004.
- (24) Anjan K. Ghosh delivered a seminar on "Packaging considerations in array based optical interconnects" in Nov. 2003, IIT Kanpur sponsored by IEEE UP section.
- (25) Anjan K. Ghosh delivered a seminar on "Technical Writing" in Feb. 2004 during Techkriti-04.
- (26) Anjan K. Ghosh delivered a talk on "Fiber optic sensors" in march 2004 in BHEL R&D Centre, Hyderabad.

4. Conference Attended Outside IIT Kanpur

- (1) P. Sensarma, National Power Electronics Conference, NPEC, Mumbai, October, 2003. Chaired a Session.
- (2) G.C. Ray and Gautam Das, Signal Processing Approach to Brain and Consciousness (invited paper), International Conf. On Intelligent Signal Proc. And Robotics, Indian Institute of Information Technology, Allahabad, Feb. 2003, 2004.
- (3) R.S. Anand, International Workshop on Physics of Semiconductor Devices 2003, IIT Madras, Chennai, Dec. 16-20, 2003.
- (4) S.C. Srivastava :Int. Conference on 'Electric Supply Industry in Transition: Issues and Prospects for Asia' at Asian Institute of Technology, Thailand, 14-16 January 2004.
- (5) S.C. Srivastava: 'POWERFEST 2003' conference at NIT Kurukshetra during 28 - 29 November 2003.
- (6) Laxmidhar Behera: International Conference on Advanced Pattern Recognition, ICAPR-03, ISI, Calcutta, 10-13, December, Contributed one Paper.
- (7) Laxmidhar Behera: Indian International Conference on Artificial Intelligence, IICAI-03, Hyderabad, 18-20, December, Contributed one Paper.
- (8) Laxmidhar Behera: International Conference on Information Technology, CIT-03, Bhubaneswar, 21-24, December, Contributed one paper and delivered an invited talk.
- (9) Laxmidhar Behera: International Conference on Intelligent Sensors and Information Processing, ICISIP-04, Chennai, 4-7 January, Contributed two papers and Chaired one session.
- (10) Laxmidhar Behera: International Conference on Intelligent Signal Processing and Robotics, ISPR-04, IIT, Allahabad, 20-23 February, Invited Lecture.
- (11) A. Ghosh attended IEEE Asia-Pacific Region-10 Conference TENCON, Bangalore, October 2003. He chaired a session in the conference.
- (12) A. Ghosh attended 27th National Systems Conference (NSC-2003), IIT Kharagpur, December 2003. He chaired two sessions in the conference.
- (13) K. Vasudevan presented contributed paper at NCC'04, IISc Bangalore.

- (14) S.P. Das attended National Power Electronics Conference (NPEC), IIT Bombay 17-18 Oct. 2003.
- (15) S.P. Das Chaired the technical session on "Resonant Converters" in National Power Electronics Conference (NPEC 2003), Oct. 16-17 2003, IIT Bombay.
- (16) S.P. Das Presented a contributed paper "A Novel Soft-Switching Quasi-Resonant Inverter for Variable Power Factor Load."
- (17) S.N. Singh: Dissemination workshop on GHG mitigation, (May 9, 2003), New Delhi. (Type of participations: Invited in Discussion)
- (18) S.N. Singh: National Workshop on Custom Power Devices, 13th June 2003. (Type of participations: Invited in Discussion)
- (19) S.N. Singh: International Conference on Intelligent system Application in Power Systems (ISAP03) Greece, 31st August- 3rd September 2003. (Type of participations: Contributed paper.)
- (20) National Conference on Modern aspect of FACTS and its Applications at Coimbatore, August 29-30, 2003. (Type of participations: Keynote speaker)
- (21) SN Singh was the **Organising Chair** of the ' Second International Symposium on High Dielectric Constant Materials: Materials Science, Processing, Manufacturing, and Reliability Issues' , Orlando, Florida, 12-16 Oct 2003.
- (22) S. Iyer and RS Anand attended the Twelfth International Workshop on the Physics of Semiconductor Devices, Chennai, 16-20 Dec 2003.
- (23) Joseph John attended Second International Conference on Optical Communications & Networks, (ICOCN 2003) Bangalore, India, October 20-22, 2003.
- (24) Nandini Gupta attended the Workshop on Modelling of Power Devices with PSPICE, CPRI, Bangalore, June 2003.
- (25) Anjan K. Ghosh presented papers in a conference on Optical Information Systems, organized by SPIE in San Diego, CA, USA in Aug. 2003. He chaired one session in this conference.
- (26) Anjan K. Ghosh presented invited paper in National Symposium on Engineering Optics in Meerut, Apr 2003. He chaired one session in this conference.
- (27) Dr. A.K. Chaturvedi chaired a session at the Tenth National Conference on Communications, Jan 30- Feb 2, 2004, IISc, Bangalore

- (28) Dr. S. Qureshi presented contributed paper in Engineering and Technology Conference, EnTech 2003, held in Kuching, Malaysia, July 31-Aug 2, 2003.
- (29) R.P. Gupta attended IEEE Power Engineering Society General Meeting, Toronto, Ontario, Canada, July 13-17, 2003 and contributed paper 'Novel Software Architecture for Power Distribution Automation.
- (30) R.P. Gupta attended Workshop on Demand Side Management and Distribution Automation, Asian Institute of Technology, Bangkok, Thailand, August 20-22, 2003.
- (31) R.P. Gupta attended the International Conference on Systemics, Cybernetics and Informatics (*ICSCI-2004*), Pentagram Research Center Pvt. Ltd., Hyderabad, India, February 12-15, 2004. and *Chaired a Tech. Session and Contributed Paper: Substation Automation Communication Protocol*
- (32) R.P. Gupta attended Workshop on Distribution System Upgrades and Modernization, Center for Management Education, Administrative Staff College of India (ASCI), Hyderabad, India, February 16-20, 2004.
- (33) R.P. Gupta attended National Workshop on Communication Protocol for Power System Automation, Central Power Research Institute, Bangalore, India, January 22-23, 2004. *Invited Paper: A Comparative Study of IEC61850 Communication Protocol with DNP3.0 and UCA 2.0.*
- (34) R.P. Gupta attended the Seminar on Power System Data Repository and Load Research, Central Power Research Institute, Bangalore, India, November 20-21, 2003 and *Invited Papers: Development of Power Distribution Automation System Web Based Monitoring of Power Distribution System.*
- (35) R.P. Gupta attended Workshop on Development of Strategy for a Model 33 kV Substation at Institute of Engineering and Technology, Lucknow, India, September 5, 2003. *Invited Lecture: IT Solution in Power Distribution Sector.*

5. Other Activities

(a) *Technology Developed*

Name of the Technology/Product, Ready for Transfer/further development needed.

- (1) Anaesthesia Monitor: This equipment has been developed by GC Ray and Gautam Das. It is a complete product and ready for transfer.
- (2) R.S. Anand, Developed the Polymer Light Emitting Diode (PLED) technology of ITO/PEDOT/MEHPPV/Ca/Al and achieved 912 Cd/m^2 for the devices, which were test operated for more than 44 hours, first ever done in India. Further development for commercialization is required
- (3) R.S. Anand, PLED devices have been made on thin plastic sheet, first ever in India. Further development for commercialization is required
- (4) R.P. Gupta and S.C. Srivastava led the efforts on Technology Development on Power Distribution Automation hardware and software including
 - Automation software to enable remote monitoring, alarm generation and remote control
 - Remote terminal unit (RTU)
 - Remotely operable load break switches suitable both for HV and LV side of distribution transformer
 - Client-Server data communication link over dialup network
 - System instrumentation
 - Automation protocols
 - Distribution automation simulator (a scaled down model of a real-life automated distribution network) to provide a test bed for a comprehensive testing of the developed technology, components and software.

(b) *Software Developed*

Title of the software, Ready for Transfer/further development needed.

- (1) R.P. Gupta developed following softwares:
 1. "Monitoring and Control Software for Power Distribution Automation"
 2. "Server Software for Remote Terminal Unit"
 3. "Application Software for Remote Terminal Unit"
 4. "Energy Audit and Accounting Software for Power Distribution Utilities"
 5. "Trouble Call Management Software for Power Distribution Utilities"
 6. "Dynamic Interaction Study Program for Small Signal Stability Analysis"

- (2) Animesh Biswas developed FDTD code for characterizing inhomogeneous dielectric resonator and also, code developed for generalized filter theory.

- (3) Y.N. Singh, Brihaspati, Brihaspati Synchron. (Ready for transfer)

(c) Industry visited/visit to other Institute for research Industry/Institute Name, Purpose, Period.

- (1) P. Sensarma, CAT, Indore, for DGFS Student and exploring possible avenues for collaboration, December, 2003.
- (2) S.C. Srivastava: Visited Asian Institute of Thailand during 20-22 August 2003 and 1-19 December 2003 to deliver invited lectures in the short term course on 'Demand Side management and Distribution Automation' and 'Power System Operation Automation & Management', respectively. Also visited this institute during 24-26 September 2003 and 14-16 January 2004 to attend a project review meeting and attend an International conference, respectively.
- (3) S.C. Srivastava: Visited IOE Tribhuvan university, Nepal during 27th Sept. to 1st Oct. 2003 to deliver invited lectures to their Masters students in the Electrical Eng. Department.
- (4) S.C. Srivastava: Visited NIT Kurukshetra on 28th November 2003 to deliver invited lectures during 'POWERFEST 2003' conference.
- (5) S.P. Das visited Indian Institute of Science, Bangalore in Aug. 2003 as an examiner of MSc (Engg.) Thesis
- (6) S.P. Das visited General Electric, Bangalore in Aug. 2003. To have general interaction.
Indian Institute of Science, Bangalore in Jan. 2004 as an examiner of Ph.D. Thesis.

S.P. Das visited BHEL, Hyderabad in Nov. 2003 as the Chairman, Preliminary Design Review and Critical Design Review Committees (May 2001 and Nov. 2003) for review of ADA, Bangalore sponsored project to BHEL, Hyderabad. The project was on "The development of compact 40 kVA, 400 Hz generator for Light Combat Aircraft."

ADE, Bangalore in Jan. 2004 to have general discussion.
- (7) S.N. Singh visited Power Grid Corporation of India, Bhauti, Kanpur with UG/PG Students (EE330, EE630, EE632).
- (8) S.N. Singh visited Centre of Advanced Technology, Indore (6/2/2004) for discussion related to projects.
- (9) S. Kar visited Department of Electrical and Computer Engineering, Clemson University, Clemson, South Carolina, USA. To carry out research activities under the ongoing Indo-US collaborative project sponsored by DST and NSF [DST/EE/20000160]. 07-12 October 2003.

- (10) Nandini Gupta visited to SAMTEL factory in Ghaziabad in connection to CRT Tubes.
- (11) A.R. Harish visited M/s Wibhu Technologies, Pune in March 2004 to deliver a talk on antenna for wireless LAN applications.
- (12) Anjan K. Ghosh visited AICTE, New Delhi as an expert on making the syllabus for AMIE courses on Electrical Engineering, Nov. 2003.
- (13). Anjan K. Ghosh visited HBTI Kanpur as an AICTE expert for evaluating AICTE proposals, Dec. 2003.
- (14) Anjan K. Ghosh visited UP Tech University, Lucknow to attend a seminar organized by AICTE on evaluating Technical Colleges, Dec. 2003.
- (15) Anjan K. Ghosh visited BHEL R&D Centre in Hyderabad in March 2004.
- (16) Dr. S. Qureshi visited, Faculty of Engineering, University of Malaysia, Sarawak, December 15, 2003-December 26, 2003.
- (17) R.P. Gupta visited Interra IT Pvt. Ltd., Noida several times during Feb. 2003 to Feb. 2004.
- (18) Animesh Biswas visited M/s Cypress Semiconductor Inc., Bangalore, from June 2003-July 2003.

(d) ***Patents***

(Title, Patents No.)

G.C. Ray, Anaesthesia Monitor: Provisional Patent No. 167/DEL/2004

Y.N. Singh, Appliation with TIFAC

(e) *Awards and Honours*

Title, Awarded by

- (1) R.S. Anand, A. Awasthi, J. Narain,: Awarded a cash prize of Rs.1000/- and a Certificate for the **Best** Poster Paper entitled ‘Effect of the CN -PPV Layer on the performance of PPV/CN-PPV Polymer LED’ at IWPSD 2003 held at IITM from 16 – 20 Dec 2003.
- (2) S.C. Srivastava :Invited to join Editorial Board of the ‘International Journal of Emerging Electric Power Systems (IJEEPS) (Berkley Electronic Press).
- (3) S.C. Srivastava: Invited to be an Editor of the Narosha Publisher’s International Series on ‘Power & Energy’.
- (4) Laxmidhar Behera and Bharat Sundaram, Stochastic filtering and and Speech Enhancement using a Recurrent Quantum Neural Network, **Best paper of the conference**, International Conference on Intelligent Sensors and Information Processing, ICISIP-04, Chennai, 4-7 January.
- (5) Debashis Dash, Rishi Dhingra and Laxmidhar Behera, Approaches to fragment assembly for DNA sequencing, **Best Student paper**, HiPC Workshop on Soft Computing, 2003.
- (6) Arindam Ghosh was awarded the Fulbright Scholarship by the United States Department of State for visiting the University of Illinois at Urbana-Champaign between May-July, 2003.
- (7) S.P. Das won Indian National Academy Young Engineers Award 2003. Awarded by Indian National Academy

(f) ***Continuing Education Activities***

Name of the courses, type (QIP, Self-sponsored/Specific Industry),
Place: Kanpur/Outside, Dates, Number attended from academic, Industry/others.

- (1) G.C. Ray , QIP Sponsored Summer School: Real-time Signal Processing and neural Computation using DSP Work Station, IIT Kanpur, July 7-19, 2003.
- (2) G.C. Ray, Self-sponsored, Real-time Signal Processing and neural Computation using DSP Work Station, IIT Kanpur, Sept. 29 – Oct. 4, 2003.
- (3) G.C. Ray, Self-sponsored course on Hands on Experience with DSP Work Station, Winter School, December 1-6, 2003, IIT Kanpur.
- (4) B. Mazhari, QIP Course : Recent trends in Displays : Organic Light emitting diodes, March 15-19, 2004
- (5) Delivered invited lectures in a Q.I.P. course on ‘Electric Power System Operation and Management in Restructured Environment ‘ during July 21 -25, 2003 at IIT Kanpur.
- (6) S.N. Singh organized a Short term course on Electric Power System Operation and Management in Restructured Environment, QIP sponsored, IIT Kanpur, 21-25 July 2003 (Participants: Academics- 30, Industry- 23).
- (7) R.P. Gupta organised Workshop-cum-Technology Dedication of Power Distribution Automation, Indian Institute of Technology Kanpur, India, February 22-23, 2003.
- (8) Anjan K. Ghosh, Self sponsored short course on Trends in Techniques and Practices in Sensors and Instrumentation, Sept. 8-12, 2003.
- (9) Anjan K. Ghosh, organizing committee members in Joint Indo US Science and Technology Forum on Futuristic Manufacturing, IIT Kanpur March 2004.

(g) ***Participation in High Level Industry Academia Interaction Programme during Summer.***

Name of the Industry, Period

R.P. Gupta : Commercialisation of the indigenously developed Distribution Automation components under ‘Technology Development Mission on Power Distribution Automation at IIT Kanpur’ is an important aspect. The above objective can be easily achieved through the demonstration project at pilot level in the utility environment. To realize the above demonstration project, while IIT Kanpur will provide its expertise to develop and integrate the system, it will take help of other industries such as Indian Telephone Industries, Raebareli and Interra Software (India), Noida for executing specific tasks in the project. These may include providing necessary components and equipments along with its installation and commissioning on the site for the implementation of the Distribution Automation project. It may be noted that the INTERRA Software (India) Limited and Indian Telephone Industry, Raebareli are already involved and signed MOU with IIT Kanpur in the automation activities of distribution system.

(h) Any other important activity not specified in above columns.

- (1) P. Sensarma, Acquisition (in process) of a high-end rapid PCB prototyping facility with scope for PTH rendering and multi-layer board fabrication.
- (2) Laxmidhar Behera: Worked as Guest Researcher, Fraunhofer Institute of Autonomous Intelligent Systems, Germany, May 19 2003 – July 18 2003.
- (3) Y.N. Singh, Involved in Distance Education programme for Chattisgarh Govt.
- (4) Nandani Gupta undertaken the following new projects:

DST-Fast Track: Theoretical and experimental investigation of an artificial treechannels in high voltage polymeric insulation.

MHRD-R&D: Experimental investigation into the mechanism of electrical tracing in polymeric insulation.
- (5) A. K. Chaturvedi mentored a team of 3 students for the IEEE Computer Society International Design Competition (CSIDC). The team qualified for participation in the World Finals at Washington DC in July 2003 and won an Honorable Mention.
- (6) A.K. Ghosh served as a member of the Awards Committee of SPIE, the International Society of Photonics Engineering.