

2009 4th International Conference on Computers and Devices for Communication

(CODEC 2009)

**Kolkata, India
14 – 16 December 2009**



**IEEE Catalog Number: CFP0901I-PRT
ISBN: 978-1-4244-5073-2**

TABLE OF CONTENTS

ADVANCES IN COMPUTERS AND NETWORKING (ACN)

Optimal Face Recognition Method using Ant Colony based Back Propagation Network.....	1
<i>D. Dolkar, B. Saha</i>	
Hierarchical Modified RPSO Based Technique for Optimal Rule Extraction.....	5
<i>S. Mukhopadhyay, A.K. Mandal</i>	
Design and Implementation of FPGA Based Interface Model for Scale-Free Network using I2C Bus Protocol on Quartus II 6.0	9
<i>P. Venkateswaran, M. Mukherjee, A. Sanyal, S. Das, R. Nandi</i>	
An Efficient Load-balancing Technique for Overlay Application Layer Multicast.....	13
<i>J. Makishi, D. Chakraborty, T. Osada, G. Kitagata, A. Takeda, K. Hashimoto, N. Shiratori</i>	
Simulation of IPv4-to-IPv6 Dual Stack Transition Mechanism (DSTM) between IPv4 Hosts in Integrated IPv6/IPv4 Network.....	17
<i>K. Chakraborty, N. Dutta, S.R. Biradar</i>	
FPGA Based Implementation of Robust Spatial Domain Image Watermarking Algorithm	21
<i>A. Basu, T.S. Das, S. Maiti, N. Islam, S.K. Sarkar</i>	
Application Layer Network Performance Analysis of IPv4 and IPv6 on Windows Operating Systems.....	25
<i>S. Narayan, Y. Shi</i>	
Selective Contrast Enhancement of Space Occupying Lesions in Brain using Vague Set Approach	29
<i>A. Das, M. Bhattacharya</i>	

CIRCUITS AND SYSTEMS (CIS)

Effects of Electromagnetic Interference on Non-autonomous Chaotic Circuits.....	33
<i>A.G. Jha, A.P. Das, A. Kumar</i>	
Identification and Analysis of Coding and Non-coding Regions of a DNA Sequence by Positional Frequency Distribution of Nucleotides (PFDN) Algorithm.....	37
<i>M. Roy, S. Biswas, S. Barman</i>	
Power, Delay and Noise Optimization of a SRAM Cell Using a Different Threshold Voltages and High Performance Output Noise Reduction Circuit	41
<i>S. Panda, N.M. Kumar, C.K. Sarkar</i>	
Transistor Count Optimization of Conventional CMOS Full Adder & Optimization of Power and Delay of New Implementation of 18 Transistor Full Adder by Dual Threshold Node Design with Submicron Channel Length	45
<i>S. Panda, N.M. Kumar, C.K. Sarkar</i>	
All-optical 4-bit Data Comparator with the Help of Non-linear Material Based Tree Net Architecture.....	49
<i>A.K. Maiti, P.K. Mahapatra, J.N. Roy</i>	
Low-Power Sequential Circuit Using Single Phase Adiabatic Dynamic Logic	53
<i>M. Chanda, A. Dandapat, H. Rahaman</i>	
Implementation of Smart Card Reader Using CPLD.....	57
<i>J. Patil</i>	
A Novel and Versatile Modeling of Powerline Channel	61
<i>S.S. Ali, A. Bhattacharya, D.R. Poddar</i>	
A Novel Approach of And-Or-Inverter (AOI) Gate Design for QCA	64
<i>K. Das, D. De</i>	
Implementation of Unsystematic Cyclic Codes on DSP 56F8300 Hybrid Board.....	68
<i>G. Deka, S. Kashyap, B.P. Pokhrel, S. Majumder, P.K. Dutta</i>	
Adiabatic Computing: A Contemporary Review	72
<i>S. Samanta</i>	
Transient Analysis of MEMS Cantilever based Binary Inverter and Design of a Ring Oscillator	76
<i>S. Chakraborty, A.R. Chaudhuri, T.K. Bhattacharyya</i>	
Transadmittance Mode Universal Filter Based on MOCCCII	80
<i>S.K. Paul, N. Pandey, A. Bhattacharyya</i>	
On-line Error Detection and Testing of AES	84
<i>J. Patil</i>	

Investigation of Robustness and Performance Comparisons of 3T - 4T DG-FinFETs for Ultra Low Power Subthreshold Logic	88
<i>R. Vaddi, S. Dasgupta, R.P. Agarwal</i>	
An Efficient Power Clock Generation Circuit for Complementary Pass-Transistor Adiabatic Logic Carry-Save Multiplier	92
<i>P. Ranjith, S.K. Mandal, D. Nagchoudhuri</i>	
All-optical Reversible Multiplexer	96
<i>G.K. Maity, T. Chattopadhyay, J.N. Roy, S.P. Maity</i>	

ELECTRON DEVICES AND MATERIALS (EDM)

Effect of Strain on Charge Centroid Location in SiO₂/s-Si/SiGe and ZrO₂/s-Si/SiGe MOS Capacitors	99
<i>M. Dey, S. Chattopadhyay</i>	
Submillimeter Wave Generation And Low Frequency Noise in GaN	103
<i>J.P. Banerjee, K.K. Ghosh</i>	
Microwave Characteristics of Al_xGa_{1-x}N/In_xGa_{1-x}N/GaN-based HEMT using Propagation Delay Model	107
<i>T.R. Lenka, A.K. Panda</i>	
Monte – Carlo study of NDR effect in GaN at Terahertz Frequencies	111
<i>A. Ghosal, K. Sarkar</i>	
Modeling of Erbium Segregation during Solid Phase Epitaxial Re-crystallization in Silicon	113
<i>M.Q. Huda, A.A.I. Ahmed, S.U. Omar, M.S. Mahmood, F.M. Mohammedy</i>	
Temperature Dependent Transport Properties in GaN Single Quantum Wells	117
<i>R. Ray, A. Nath, P.K. Ghosh</i>	
A Compact Threshold Voltage Model for Narrow Channel Nano-Scale MOSFETs	120
<i>S. Pandit, C.K. Sarkar</i>	
Prospects of Wide Band Gap Material ZB-GaN over Low Band Gap GaAs-based IMPATT Devices	124
<i>P.R. Tripathy, A.K. Panda, S.P. Pati</i>	
Effects of Punch-Through on Terahertz Frequency Characteristics of 4H-SiC Based p⁺⁺ p n n⁺⁺ IMPATT Devices	128
<i>M. Mukherjee</i>	
Growth Mechanism for Vertical Growth of Nanopillars in Progressive Annealed HWCVD Grown Silicon Nanostructures	132
<i>T.C. Patil, S. Chakrabarti</i>	
A Compact Drift-diffusion Current Model of Strained-Si-Si_{1-x}Ge_x MOSFETs	136
<i>V. Chakraborty, B. Mukhopadhyay, P.K. Basu</i>	
Scaling Issues in Nanoscale Double Gate FinFETs with Source/Drain Underlap	140
<i>T. Dutta, S. Dasgupta</i>	
Feasibility of Laser Action at 1550 nm by Direct Gap Type I GeC/GeSiSn Heterojunctions	144
<i>B. Mukhopadhyay, G. Sen, P.K. Basu</i>	
Estimation of Surface Potential Variation in Short Channel MOSFET by Solving 2D Poisson's Equation	148
<i>S. Sengupta, S. Kundu</i>	
Swarm Optimization Based On-Chip Inductor Optimization	152
<i>S.K. Mandal, A. Goyal, A. Gupta</i>	
Vehicular Communication and Safety in Realization of Intelligent Transport System	156
<i>R. Bera, D. Mondal, S. Sil, S. Dhar, S.N. Sur, D. Bhaskar, S.K. Sarkar, D. Kandar</i>	
Dielectric Property and Breakdown Study of Metal-Insulator-Metal Capacitor	160
<i>M.K. Hota, C. Mahata, S. Mallik, C.K. Sarkar, C.K. Maiti</i>	
Interface Defect Centers in Oxides on Si_{1-x}Ge_x for ULSI Applications	164
<i>S. Mallik, C. Mahata, M.K. Hota, C.K. Sarkar, C.K. Maiti</i>	
Ge/SiGe RCE Photodetectors : A Comparative Study based on Franz-Keldysh Effect and Quantum Confined Stark Effect	167
<i>G. Sen, B. Mukhopadhyay, P.K. Basu</i>	
Mixed Mode Simulation of Heavy Ion Impact on 3D SRAM Cell	171
<i>S.S. Rathod, A.K. Saxena, S. Dasgupta</i>	
Influence of Gate Architectures on the Performance of SOI MOSFETs Including the Strained Channel	175
<i>S. Bhattacherjee, A. Biswas, P.K. Basu</i>	

Mobile Space Charge Effects on Terahertz Properties of Wz-GaN Based Double Drift IMPATT Oscillators.....	179
<i>M. Mukherjee, S. Banerjee, J.P. Banerjee</i>	
Debye Temperature of II-VI and III-V Semiconductors.....	183
<i>V. Kumar, V. Jha, A.K. Shrivastava</i>	
Electrical Characteristics of Hf-based GaAs MOS Capacitors with thin HfO_xN_y Interlayer	187
<i>T. Das, C. Mahata, G.K. Dalapati, D.Z. Chi, G. Sutradhar, P.K. Bose, C.K. Maiti</i>	
Modeling of Threshold Voltage for Undoped Surrounding Gate MOSFET: A Gaussian Approach.....	191
<i>P. Roy, B. Syamal, N. Mohankumar, C.K. Sarkar</i>	
Bandgap Engineering of One-Dimensional Photonic Crystal Structures	195
<i>H. Dey, S.K. Varshney</i>	
Reduced Order Macromodel Extraction of MEMS Based Varactor and Its System Level Simulation for RF Applications	199
<i>A. Bhattacharya, R.R. Chaudhuri, A.R. Chaudhuri, S. Chakraborty, T.K. Bhattacharyya</i>	

NANO-ELECTRONICS AND NANO-PHOTONICS (NEP)

Power Dissipation in SWCNT-Interconnect.....	203
<i>M.K. Rai, G. Spandana, Nivedita, S. Sarkar</i>	
RF Performance of Process-induced Strain-engineered n-FinFET	207
<i>M. Sengupta, S. Chattopadhyay, C.K. Maiti</i>	
Calculations for the Band Lineup and Band Offsets of AlGaN/GaN Qws and Effects of Electric Field on the Photoluminescence	211
<i>S. Kabi, D. Biswas, S. Panda</i>	
Calculation of Current in Multiple Quantum Well Structure with Variable Barrier Heights	215
<i>K. Mukherjee, N.R. Das</i>	
A Closer Look into the III-V Semiconductor Quantum Well Under an Electric Field as Used in Capacitance- Voltage Measurement.....	219
<i>S. Panda, D. Biswas</i>	
Drain Current vs. Drain Voltage Characteristics of Nanoscale 2D GaAs MOSFETs	223
<i>A. Ghosal, K. Sarkar</i>	
Effect of Shell Thickness on Exciton and Biexciton Binding Energies in ZnSe/ZnS Core/Shell Quanutm Dot	225
<i>S. Chattopadhyay, J.T. Andrews, P. Sen, P.K. Sen</i>	

OPTOELECTRONICS AND LIGHTWAVE TECHNOLOGY (OLT)

Optical Bistability in a Nonlinear Resonator With Saturable Losses and Intensity-Dependent Refractive Index.....	229
<i>S. Bhargava, C. Porzi, P.K. Datta, A. Bogoni, L. Poti, R. Gangopadhyay</i>	
Calculation of Gain in GaAlAs/GaAs Superlattice Laser due to Intersubband Longitudinal Optic (lo) Phonon Transitions.....	233
<i>A. Banerjee, S. Mukhopadhyay, A. Ghoshal</i>	
Analytical Technique to Mitigate the Effects of Composite Second Order and Composite Triple Beat in Mach-Zehnder Modulator	235
<i>M. Shahildul Islam, M. Saiful Islam</i>	
Spectral Compression of Pulses Due to Self-Phase Modulation and Group Velocity Dispersion on Direct Detection Optical Transmission System	239
<i>B.K. Karmaker, M.S. Islam</i>	
Polarization Encoded All-optical Ternary Max Gate	243
<i>C. Taraphdar, T. Chattopadhyay, J.N. Roy</i>	
2-Channel MUX-DEMUX for CWDM Systems using Phase Shifted Photonic Crystals.....	247
<i>S. Dasgupta, C. Bose</i>	
A Novel Method of Optical Generation of mm-wave Signals using Optical Carrier Suppression.....	250
<i>A.K. Saw, T. Chattopadhyay</i>	
The Role of Third Order Dispersion on Pulse Compression in a Highly Nonlinear Fibre	253
<i>T. Chattopadhyay, S. Das</i>	
Achievement of Broad Band and Higher Effective Raman Gain Fibre Raman Amplifier with Multiple Pump Wavelength Sources	257
<i>S. Pramanik, S. Sarkar</i>	

Study of Performance Degradation Introduced by ADD/DROP Multiplexing Operation in a SOA-Based WDM Ring Network	260
<i>I. Sengupta, A.D. Barman</i>	
Impact of Joint Effect of Statistical Fading and Optical Non-linearities on the Performance of OFDM based Radio-over-fiber Transmission System	264
<i>S. Chandra, R. Gangopadhyay</i>	
Analysis of Noise Performance and its Temperature Dependence for an In_{0.10}Ga_{0.90}Sb Avalanche Photodiode.....	268
<i>V.T. Rouf, W. Hussain, F.M. Mohammedy</i>	
Design Optimization of Non-linearly Chirped Fiber Bragg Grating as Dispersion and Dispersion Slope Compensator for Optical Transmission System	272
<i>S. Chandra, R. Gangopadhyay</i>	
Erbium Doped Silicon Nanocrystal for Optical Amplification and Lasing	276
<i>M.Q. Huda, S. Saha, M.S. Akter, M.T. Hasan, S. Subrina, F.M. Mohammedy</i>	
Performances of Straight and Bent Dispersion Decreasing Fiber Amplifiers in Parabolic Similariton Pulse Formation.....	280
<i>D. Ghosh, M. Basu</i>	
Gain Spectra and Characteristics of a Transistor Laser with InGaAs Quantum Well in the Base	284
<i>R. Basu, B. Mukhopadhyay, P.K. Basu</i>	
Error Probability Density and Bit-Error-Rate Due to SRS Cross-talk in a WDM Receiver	288
<i>S. Sarkar, N.R. Das</i>	
All-Optical Binary Coded Decimal (BCD) Adder	292
<i>D.K. Gayen, A. Bhattacharyya, R.K. Pal, J.N. Roy</i>	
Optimally Apodized Ring-resonator Filter for DPSK Demodulation	296
<i>R. Agarwal, R. Gangopadhyay, G. Prati, S. Gupta, P. Pintus</i>	
On the Ge-content Dependent Noise Current in Si/SiGe MQW Photodetector	300
<i>M.K. Das, N.R. Das</i>	
Theoretical and Experimental Investigation of Inter-Channel Crosstalk Mitigation by Assist Light in a TOAD De-Multiplexer.....	304
<i>A.D. Barman, F. Fresi, I. Sengupta, L. Poti, A. Bogoni</i>	
Calculating the Signal to Noise Ratio of a RCE Ge-Based Schottky Photodetector	308
<i>H.S. Dutta, N.R. Das</i>	

RADIO-COMMUNICATION AND SPACE SCIENCES (RSS)

AILA-2009 and its Effects on VLF Sferics	312
<i>S.S. De, B. Bandyopadhyay, S. Paul, D.K. Haldar, S. Nandi, M. Sanfui, S. Barui, G. Chattopadhyay</i>	
Modelling of GAGAN TEC data using Spherical Harmonic Functions	316
<i>D.V. Ratnam, C.H. Sujatha, A.D. Sarma, S. Ravindran</i>	
Rain Attenuation Measurements using Synthetic Storm Technique over Ahmedabad.....	320
<i>A.K. Shukla, S. Das, B. Roy</i>	
Kalman Filter Approach for Prediction of Ionospheric Total Electron Content	324
<i>R. Acharya, B. Roy, M.R. Sivaraman, A. Dasgupta</i>	
On Some Effects of Perturbations in the Ionosphere due to Electromagnetic Precursory Signals from Earthquake.....	328
<i>S.S. De, B.K. De, B. Bandyopadhyay, S. Paul, D.K. Haldar, S. Barui, M. Sanfui, A. Bhownick, P. Pal, S. Nandi, T.K. Das</i>	
Classification of Convective and Stratiform Types of Rain and their Characteristics Features at a Tropical Location	332
<i>S. Das, A.K. Shukla, A. Maitra</i>	
Studies on Non-linear Travelling Ionospheric Disturbances and Mode Coupling within the Auroral Region	336
<i>S.S. De, B.K. De, B. Bandyopadhyay, S. Paul, M. Sanfui, D.K. Haldar, M. Bose, G. Chattopadhyay</i>	
Comparison of TRMM Estimated Rainfall with Ground Truth over Calcutta	340
<i>A. Maitra, R.S. Jaiswal, S.R. Fredrick, V.S. Neela, K. Chakraborty, A. Adhikari, A. Bhattacharya, M. Rasheed, L. Zaveri</i>	
Femtosecond Terawatt Laser System to Produce Artificial Rain.....	344
<i>D.K. Chakrabarty, S.K. Chopkar, N.N. Purkait</i>	
Effects of Solar Eclipse of July 22, 2009 on VLF Signals and Atmospheric Electricity Parameters over Kolkata	347
<i>S.S. De, B.K. De, B. Bandyopadhyay, T.K. Das, S. Paul, D.K. Haldar, S. Nandi, S. Barui</i>	

Multimedia Broadcast with Fountain Code in Cellular CDMA	351
<i>S.D. Roy, S. Kundu</i>	

WIRELESS AND MOBILE TECHNOLOGY (WMT)

Exploiting the Loss-Frequency Relationship using RF Communication in Underwater Communication Networks	355
<i>U. Chakraborty, T. Tewary, R.P. Chatterjee</i>	
Single Level Address Reorganization In Wireless Personal Area Network.....	359
<i>D. Giri, U.K. Roy</i>	
Effects of Fitness Scaling and Adaptive Parameters on Genetic Algorithm based Equalization for DS-UWB Systems.....	363
<i>N. Surajudeen-Bakinde, X. Zhu, J. Gao, A.K. Nandi</i>	
A Multi-Path Certification Protocol for Mobile Ad Hoc Networks.....	367
<i>J. Sen</i>	
A Distributed Multiple-Slot Assignment Algorithm for Wireless Sensor Networks.....	371
<i>A. Sinha, N. Das</i>	
Design and Development of Activation and Monitoring of Home Automation System via SMS through Microcontroller	375
<i>T. Begum, M.S. Hossain, M.B. Uddin, M.S.H. Chowdhury</i>	
Design of Duo-Binary CRSC Turbo Convolution Code	378
<i>D. Bera</i>	
Small Set Orthogonal Kasami Codes for CDMA System.....	382
<i>A. Chandra, S. Chattopadhyay</i>	
Comparison of Optimization Criteria for Dynamic Subcarrier Allocation in Single Carrier FDMA Systems	386
<i>O. Nwamadi, X. Zhu, A.K. Nandi</i>	
QoS Aware Predictive Call Admission Control and Resource Reservation in Next Generation Wireless Networks	390
<i>A. Ukil</i>	
Roof-top Modeling of Building for Microcellular Systems Using Double Diffraction Coefficient	394
<i>S. Soni, A. Bhattacharya</i>	
Adaptive Frequency-Domain Channel Estimation based on Kalman Smoothing for Uplink MIMO OFDMA Systems	398
<i>J. Gao, X. Zhu, Y. Wu, A.K. Nandi</i>	
FPGA Implementation of a Digital FM Modem for SDR Architecture	402
<i>I. Hatai, I. Chakrabarti</i>	
Smart Home For Elderly Care Using Optimized Number Of Wireless Sensors	406
<i>A. Gaddam, S.C. Mukhopadhyay, S.S. Gupta</i>	
Performance Analysis of Different Power Allocation Strategies for Downlink Cellular CDMA	410
<i>S.D. Roy, S. Nallagonda, S. Kundu</i>	
Packet Level Performance of a CDMA Wireless Sensor Networks in Presence of Correlated Interferers	414
<i>U. Datta, S. Kundu</i>	

ADDITIONAL PAPERS

Independent Component Analysis - An Innovative Technique for Wireless MIMO OFDM Systems	418
<i>A.K. Nandi, J. Gao, X. Zhu</i>	
GaAs Based Quantum Dot Superluminescent Diodes for Optical Coherence Tomography of Skin Tissue	426
<i>R.A. Hong, P.D.L. Greenwood, D.T.D. Childs, N. Krstajic, K. Kennedy, K.M. Groom, M. Hugues, M. Hopkinson, L.E. Smith, S.J. Matcher, M. Bonesi, S. Macneil, R. Smallwood</i>	
Si MOSFET Roadmap for 22nm and Beyond.....	432
<i>H. Iwai</i>	
Rigorous Characterization of Silicon Nanowire for Compact Nanophotonic Devices	436
<i>B.M.A. Rahman, D.M.H. Leung, K. Namassivayane, A. Agrawal, M. Ashraf, K.T.V. Grattan</i>	
Potential Materials for Avalanche Photodiodes Operating Above 10Gb/s	442
<i>C.H. Tan, J.S. Ng, S. Xie, J.P.R. David</i>	

Application of Time lenses for High Speed Fiber-optic Communication Systems	448
<i>S. Kumar, D. Yang</i>	
Extended Wavelength Avalanche Photodiodes	454
<i>J.P.R. David, J.S. Ng, C.H. Tan, Y.L. Goh</i>	
Core-shell Ge Nanowires and Heterojunctions for Memory and Photodetector Devices	458
<i>S.K. Ray</i>	
RF MEMS SWITCH: An Overview at- a-Glance	459
<i>S.K. Lahiri, H. Saha, A. Kundu</i>	
Cloud Computing – the Next Chasm.....	464
<i>K. Hazra</i>	
NanoSilicon Photonics	465
<i>L. Pavesi</i>	
GaInNAs- Materials and Applications.....	466
<i>J. Rorison</i>	
Micro-resonator Based Photonic Components in Advanced Optical Communication Systems	467
<i>R. Gangopadhyay</i>	
III-V Quantum Dots for Optoelectronic Device Applications.....	468
<i>L. Fu, G. Jolley, S. Mokkapati, A. Majid, H.F. Lu, H.H. Tan, C. Jagadish</i>	
Recent Advances in Fully Polarimetric Space- SAR Sensor Design and its Applications	469
<i>W. Boerner</i>	
CMOS Photodetectors and Imaging Systems for Biomedical Applications.....	473
<i>M.J. Deen</i>	
Hybrid Test Vector Compression in System-on-Chip Test- An Overview and Methodology	478
<i>S.N. Biswas, S.R. Das, E.M. Petriu, A. Hossain</i>	
Device Considerations for Ultra-Low Power Analog Integrated Circuits	484
<i>S.K. Saha</i>	
Secure Communication in Cognitive Radio Networks	490
<i>S. Sanyal, R. Bhaduria, C. Ghosh</i>	
Nonlinear Time Series Analysis for On-line Handwritten Signature Verification.....	494
<i>B. Chakraborty</i>	
A Note on Cluster Size of WSN	501
<i>G. Chakraborty</i>	
Next Generation Network in Emerging Markets	507
<i>P. Mukherjee, P. Yadav</i>	
Recent Advances in Radio Environment for Radio Communication in India.....	508
<i>S.K. Sarkar</i>	
Interaction of Light with an Array of Subwavelength Apertures in a Metallic Slab	509
<i>A.S. Vengurlekar</i>	
Organic Sensors for Explosive Detection.....	510
<i>R.S. Dudhe, V. Seena, S. Mukherji, A. Kumar, R. Rao</i>	
Monolithic Integration in Photonics- Where is the Commercial Imperative?.....	516
<i>J.H. Marsh</i>	
Application of X-Ray Scattering Techniques for Semiconductor-based Quantum Structures.....	522
<i>M. Sharma, M.K. Sanyal, B. Saha, P. Chakraborty</i>	
Author Index	