

Contents

Part I Keynote Address

Investigation of Degradation in Photovoltaic Modules by Infrared and Electroluminescence Imaging	3
Archana Sinha, Subinoy Roy, Sagarika Kumar and Rajesh Gupta	
Solar Holography—A Potential High Efficiency Green Energy Solution	11
P.T. Ajith Kumar	
Status and Technology of Present Day Solar Cells	19
K.K. Ghosh	

Part II Plenary and Invited Address

A Brief History of Aberrometry Applications in Ophthalmology and Vision Science	31
Mohana Kuppuswamy Parthasarathy and Vasudevan Lakshminarayanan	
Application of Phase-Shifted Fringe Projection Method with Linear Fiber Arrays Using Talbot Effect to Height Measurement of BGA	41
Motoharu Fujigaki, Takumi Hayashi and Yorinobu Murata	
Light Amplification in Photorefractive Ferroelectric Liquid Crystal Blends Containing Quarter-Thiophene Photoconductive Dopant	49
Takeo Sasaki, Shouta Morino and Khoa Van Le	
Photorefractive Optical Cryptography: A Personal Tour	57
Kehar Singh	
Interferometry: From Hooke till Date	65
Rajpal S. Sirohi	
Role of Light in Green Technology	73
Ajoy Chakraborty	

Pareto Optimality Between Far-Field Parameters of Lossless Phase-Only Filters.	79
L.N. Hazra and S. Mukhopadhyay	
Can Photons Affect the Elastic Constants in Heavily Doped Nano Wires?	89
R. Paul, S. Ghatak, S. Das, M. Mitra, T. Datta and K.P. Ghatak	
Noble Metal Doped Optical Fiber for Specialty Light Source	95
Rik Chattopadhyay, Arindam Haldar, Mukul C. Paul and Shyamal K. Bhadra	
Digital Holography for Recognition and Security of 3D Objects.	107
Dhirendra Kumar and Naveen K. Nishchal	
Recent Advances in Fiber Loop Ringdown Sensors	117
Tarun Kumar Gangopadhyay and Jijo V. Ittiarah	
All-Optical Fiber-Cantilever Beam-Deflection Magnetometer: Detection of Low Magnetic Field and Magnetization Measurement.	127
Partha Roy Chaudhuri and Somarpita Pradhan	
Dynamics of Dissipative Solitons in Active Silicon Waveguides.	141
Samudra Roy	
Part III Green Photonics: Applied Photovoltaics, Application of Solar Energy, Organic Photovoltaics	
Wavelength Response Analysis and Optimization of Photopolymer Volume Holographic Elements for Solar Energy Applications	149
T.L. Shaji Sam and P.T. Ajith Kumar	
Investigating the Growth-Time Dependent Comparative Performance of Vapour-Liquid-Solid (VLS) Grown p-CuO/n-Si Thin Film Hetero-Junction Solar Cells	157
Jenifar Sultana, Somdatta Paul, Anupam Karmakar and Sanatan Chattopadhyay	
Electrical Characterization of n-ZnO NW/p-CuO Thin Film Hetero-Junction Solar Cell Grown by Chemical Bath Deposition and Vapor Liquid Solid Technique with Varying Reaction Time	165
Somdatta Paul, Jenifar Sultana, Aritra Banerjee, Pintu Singha, Anupam Karmakar and Sanatan Chattopadhyay	
Analytical Modeling of Vertically Oriented Standalone Si-Nanowire Metal-Oxide-Semiconductor Capacitors for Wavelength Selective Near-Infrared Sensing Applications.	173
Subhrajit Sikdar, Basudev Nag Chowdhury and Sanatan Chattopadhyay	

Computing Spectral Response of GaAs Solar Cell with Quasi-Fermi Level Approximation	181
Somshuddha Datta, Tamalika Chakraborty and Arpan Deyasi	
Optimal Designing of Higher Efficiency Chalcogenide Thin Film Solar Cell	189
Koushik Sarkar, Sudipta Banerjee, A.K. Chakraborty and K.K. Ghosh	
Part IV Fibre and Integrated Optics, Photonic Crystals, Silicon Photonic Devices	
Highly Non-linear Simple Designed Solid Core Photonic Crystal Fiber	199
Moutusi De, Rahul Kumar Gangwar and Vinod Kumar Singh	
Butterworth Filter Design Using Ternary Photonic Crystal Structure Under Polarized Incidence of E.M. Wave	205
Meenakshi Banerjee, Romi Dey, Arpan Deyasi, Sandip Dey and Antara Das	
Numerical Simulation of Millimeter Wave Generation in a Digital Fiber Optic Link	211
V. Charan Teja and M. Ganesh Madhan	
Enhanced of Photonic Bandgaps in One-Dimensional Plasma Photonic Crystal with Defect	219
G.N. Pandey, Anil Kumar Shukla, Khem. B. Thapa and J.P. Pandey	
Design of All-Optical Logical AND Gate Based on Photonic Crystal Using T-Shaped Waveguide	227
Tanvi Sachdev, Anil Kumar Shukla and G.N. Pandey	
Part V Lasers, Interferometry, Imaging, Devices	
Surface Plasmon Resonance Based Differential Phase Analysis Using Mach-Zehnder Interferometric Set-up	235
Jayeta Banerjee, Mahua Bera and Mina Ray	
Modeling of a Transversely Pumped Aprotic Liquid Laser	241
A.K. Varshney, Avinash C. Verma, Gaurav Singhal, Mainuddin and R.K. Tyagi	
Differential Phase Imaging of Evanescent Wave in Total Internal Reflection for Determining Refractive Index	249
Tania Das and Srinjini Roy	

Gray to Binary Code Converter Using Ti-Indiffused Lithium Niobate Based Mach-Zehnder Interferometer	257
Harsh Kumar, Laxman Kumar, Vijay Janyani, Buryy Oleh, Ubizskii Serhij and Ghanshyam Singh	
Fingerprint Detection and Analysis Using Talbot Interferometry	263
Jitendra Dhanotia, Litesh Bopche, Vimal Bhatia and Shashi Prakash	
Birefringence Analysis Using Mach-Zehnder Interferometer	271
Santa Sircar and Ipsita Chakraborty	
Part VI Optical Communication and Networks	
Fuzzy Based Relay Selection for Secondary Transmission in Cooperative Cognitive Radio Networks	279
Jyoti Sekhar Banerjee, Arpita Chakraborty and Abir Chattopadhyay	
Optical Generation of Subcarrier Multiplexed (SCM) Millimeter Wave Signal and Its Application in Radio Over Fiber System	289
Madhumita Bhattacharya	
Design and Performance Analysis of Traffic Rerouting Based Congestion Control Technique in Optical WDM Network	293
Manoj Kr. Dutta	
Outage Analysis of an Inter-relay Assisted Free Space Optical Communication System	301
Himanshu Khanna, Mona Aggarwal and Swaran Ahuja	
Part VII Optical and Digital Data and Image Processing	
Single Public Key Dependent Attack on Optical Asymmetric Cryptosystem	311
Areeba Fatima and Naveen K. Nishchal	
Weighted Laplacian Energy Based Image Fusion	317
Pradeep Shankhwar, A.K. Singh and B.S. Chauhan	
Radon Transforms and Chaotic Mask Based Image Encryption for Information Security	327
Avinash Kumar Jha, Sajan Ambadiyil and Himanshu Shekhar	
Pose Invariant Face Recognition Technique Based on Eigen Space Approach Using Dual Registration Techniques After Masking	335
Tumpa Dey and Dibyendu Ghoshal	

Part VIII Opto-Electronic Devices, Terahertz Technology

Hybrid VLC-RF System for Real Time Health Care Applications	347
Anshul Vats, Mona Aggarwal, Swaran Ahuja and Sharda Vashisth	

Arc-Induced Long Period Gratings: Analysis of the Fabrication Parameters on the Surrounding Refractive Index Sensitivity	355
Rajeev Ranjan, Flavio Esposito, Stefania Campopiano and Agostino Iadicicco	

Design of Data Transmission System for Application in Terahertz Frequency	361
Sanjana Meshram, Manoj Dongre, Kshitij Mittholiya and Saurabh Bhardwaj	

Gesture Based Audio/Video Player	369
Indrajeet Vadgama, Yash Khot, Yash Thaker, Pranali Jouras and Yogita Mane	

Part IX Nano-Photonics, Bio-Photonics, Bio-Medical Optics

Automated Glaucoma Detection of Medical Image Using Biogeography Based Optimization	381
Debasree Sarkar and Soumen Das	

Quality Assessment of Medicinal Leaves Through Biospeckle Technique	389
Jitendra Dhanotia, Litesh Bopche, Vimal Bhatia and Shashi Prakash	

Biospeckle Assessment of Bread Spoilage by Fungus Contamination Using Alternative Fujii Technique	395
Amit Chatterjee, Reena Disawal and Shashi Prakash	

Evaluation of Aging Effect on Pea Seed Germination Using Generalized Difference Method	403
Amit Chatterjee, Reena Disawal and Shashi Prakash	

Part X Lasers, Quantum Optics and Information Technology

Electronic Band Structure of Quantum Cascade Laser	411
Ritabrata Chakraborty, Arpan Deyasi, Arkadeep Paul and Shrabani Nayak	

Effect of Material Parameters on the Attenuation and Amplification of an Incident Laser Beam	417
Rahul Basu	

Distortion Analysis of 1.3 μm AlGaInAs/InP Transistor Laser	425
R. Ranjith, S. Piramasubramanian and M. Ganesh Madhan	

Oscillator Strength of Gaussian Double Quantum Well for Intersubband Transition	433
Debasmita Sarkar and Arpan Deyasi	
 Part XI E. M. Radiation Theory and Antenna	
Multi-slot Loaded Dual Band Compact Half-Mode SIW Triangular Antenna	441
Soumen Banerjee, Sombuddha Chatterjee, Sampoorna Das Mazumdar, Malay Gangopadhyaya and Biswarup Rana	
A Compact Half-Mode SIW Based Semi-circular Antenna with X-Shaped Slot	449
Soumen Banerjee, Twinkle Mohanty, Sneha Das and Biswarup Rana	
Topical Survey on Daylighting System	455
Divya Pandey, Rajeev Ranjan, Rishabh Raj, Anukriti Tyagi and R. Navamathavan	
Performance Modifications of a Dielectric Ring Resonator Loaded Monopole Using a Composite Frequency Selective Surface	465
Rudraishwarya Banerjee, Biswarup Rana and Susanta Kumar Parui	
 Part XII Cryptography, Micro-Electronics and VLSI	
Chaotic Elements—A Novel Physical Cryptographic Primitive for Document Authentication	473
Sajan Ambadiyil and V.P. Mahadevan Pillai	
Analytical Modelling of Hybrid CMOS SET Rijndael Cryptography	481
J. Gope, S. Chowdhury, S. Chakraborty and S. Bhadra	
Audio File Digitization and Encryption Using ASCII Conversion	489
Soumen Das and Debasree Sarkar	
 Part XIII Quantum and Non-Linear Optics, Opto-Electronic Devices	
Effect of TiO₂ Nanoparticle Doping on the Electrical Properties of Ferroelectric Liquid Crystal	499
Pradeep Kumar and Aloka Sinha	
Improved Noise Rejection in Metamaterial based Defected Photonic Crystal Structure	507
Solanki Ghosh, Ruma Dutta, Varsha Shaw and Arpan Deyasi	

Computational Analysis of Carrier Mass Under Energetic Photons in Accumulation Layers of MOSFET Devices.	513
R. Paul, S. Ghatak, S. Das, M. Mitra and T. Datta	
Phase Shifters in QPM Device for Domain Engineering	517
Nagarajan Asvin, Arvind Ganesh, Navin Infant Raj, Toijam Sunder Meetei, Shanmugam Boomadevi and Krishnamoorthy Pandiyan	
Simulated Annealing: An Approach for Multiple QPM.	521
Siva Chellappa, Shiva Prabhakar, Narayanan Balaji, Toijam Sunder Meetei and Krishnamoorthy Pandiyan	
Part XIV Non-Linear Waveguides, Optical Fibre Devices, Photonic Crystal	
Spectral Bandwidth Tuning at Telecommunication Wavelength by Specific Intensity Modulation in Nonlinear Plasmonic Cavity Coupled Waveguide	529
Sushmita Paul and Mina Ray	
Investigation on Fiber Loop Ring Resonator for Chemical Sensor Application	535
Arun V.S. Nair, Jijo V. Ittiarah and Tarun Kumar Gangopadhyay	
Spectrally Efficient SSB Optical OFDM Signal Using Balanced Detection	543
Gokul Boro and Subhash C. Arya	
Design of 1×4 All Optical Splitter Based on 2D Photonic Crystal	551
Bani Gandhi, Anil Kumar Shukla and G.N. Pandey	
Analysis of a Novel Grating-Assisted Directional Coupler by Using the Normal Mode and Coupled Mode Analyses	559
Parvinder Kaur and M.R. Shenoy	
Part XV Optical and Digital Image Processing Devices	
1-D Photonic Crystal Based Dynamic Encoder/Decoder for 2D W-T OCDMA System.	567
M. Bala Subramanian, K.S. Resmi and Prita Nair	
Full-Duplex 20 Gbit/s Fiber-Optic Link Design Based on Dual-Polarization Differential Quaternary Phase-Shift Keying.	575
Dhiman Kakati and Subhash C. Arya	

Development of MATLAB Based Image Stitching Tool for Detection of Hidden Objects at 89 GHz	583
Triveni Keskar, Vijay R. Dahake, Kshitij Mittholiya, Archana Hegde, A.M. Basil and Anuj Bhatnagar	
Modelling for Spectral Domain Optical Coherence Tomography (SD-OCT) System	591
Suyog Choudhari, Mukesh Patil and Roshan Makkar	
Characterization of Memory Effect of Polarization Speckles from a Birefringent Scatterer	599
Abhijit Roy, Rakesh K. Singh and Maruthi M. Brundavanam	
Part XVI Micro-Electronics and VLSI	
Analytical Study of High Speed Low Power Consuming Reversible Nano Device CPLD	607
Jayanta Gope, Sanjay Bhadra and Shantanu Bhadra	
Reversible Logic Gates Based on Single Spin Logic	613
J. Gope, S. Mondal, M. Kundu, S. Chowdhury and S. Bhadra	
Hypothetical Modeling of Single Spin Logic Based Booth's Multiplier IC	621
Jayanta Gope, Snigdha Chowdhury (Kolay), Sanjay Bhadra and Shantanu Bhadra	
Designing Comprehensive Tool for Analytical Modeling of Single Spin Logic	629
J. Gope, Shantanu Bhadra, Sanjay Bhadra and Koustuv Sarkar	
Part XVII Interdisciplinary: Lasers, Interferometry and Devices	
Talbot Interferometry for Focal Length Measurement Using Linear and Circular Gratings	639
Rahul K. Choudhary, Sunit M. Hazarika and Rajpal S. Sirohi	
Simulations Studies for Femtosecond Laser Inscribed Bragg Grating Structures on Polymer	649
Sanyogita, U. Das and P.K. Panigrahi	
Focal Length Measurement Using Modified Bessel's Method	659
Sunit M. Hazarika and Rajpal S. Sirohi	
Automatic Vehicle Detection and Motion Path Tracking Based on Gaussian Mixture Model	669
Kyamelia Roy, Soham Saha, Tanmoy Mondal and Sheli Sinha Choudhury	

**Stability Improvement of Captive Generator Sets Utilizing
FACTS Device. 681**
Utpal Goswami, Madhuria Chanda, Arijit Ganguly, P.K. Sadhu
and Suprava Chakraborty

Author Index. 687

Advances in Optical Science and Engineering
Proceedings of the Third International Conference,
OPTRONIX 2016

Bhattacharya, I.; Chakrabarti, S.; Reehal, H.S.;
Lakshminarayanan, V. (Eds.)

2017, XLIII, 689 p. 429 illus., Hardcover

ISBN: 978-981-10-3907-2