

Synopsis of Bio Data of Dr. Madhuchhanda Mitra

1	Name	Dr. Madhuchhanda Mitra		
2	Present Position	Professor, Instrumentation Engineering, Department of Applied Physics, University of Calcutta		
3	Academic Qualifications	Ph. D.(Tech), M. Tech. (1 st Class 1 st , Gold Medal), B. Tech. (1 st Class), B. Sc. (Hons.) in Physics(1 st Class, 1 st Div.), Gate Qualified		
4	Experience:	Research experience - 32 years Teaching experience- 27 years		
	Area of Research	Biomedical Signal Processing, Instrumentation, Material Science		
6	Publications	International Journal	National Journal	Conferences
	Upto 2009	26	8	59
	2010-2022	89	1	44
	Total	115	09	103
7	Citations	3725		
8	h-index	28		
9	i-10 index	76		
10	Books Published	09		
11	Evidence of Research			
	PhD guidance	Awarded- 12	Registered: 06	
		Submitted : 02	Yet to be registered : 02	
12	R & D Projects	Completed: 03		
13	Administrative Experience	Served as Dean (FET) (Acting) (10.1.2020 - 9.1.2021)		
		Served as Head of the Department (1.4.2012 - 31.3.2014)		
		Served as Member of the Syndicate, Calcutta University (2012-2013)		
		Served as Member of the Senate, Calcutta University (2012-2014)		
		Acted as Member of the committee to formulate Transfer policy of the University Employees, CU		
		Acted as Member of Faculty Councils of PG studies in Engineering & Technology of Calcutta University from 2003 to 2007		

List of papers

International Journal :

Published Papers :

2022

- 1 S Sarkar, P Bhattacharyya, M Mitra, S Pal, “Automatic detection of obstructive and restrictive lung disease from features extracted from ECG and ECG Derived Respiration signals”, Biomedical Signal Processing and Control, (Elsevier Science publication) , Volume 71, Part B, January 2022.
- 2 S Das, S Pal, M Mitra, “Deep learning approach of murmur detection using Cochleagram”, Biomedical Signal Processing and Control, 77, 2022 , 103747, (Elsevier Science publication)
- 3 Abhishek Chakraborty, Deboleena Sadhukhan, Madhuchhanda Mitra, “Efficient and lightweight detection of PPG onset and systolic peaks using implementable time-domain strategies”, Measurement , vol. 200, 111628, 15/8/2022, 14 pages, (Elsevier Science publication)
- 4 M.Sahoo, S.Ghorai,S.Pal, M.Mitra, “A Multi-Layer stacked ensemble classifier model for improved classification accuracy of Maculopathy gradation” , Displays, 73(2022), (Elsevier Science publication).
- 5 S Sarkar, S. Bhattacharjee P Bhattacharyya, M Mitra, S Pal, “Automatic identification of Asthma from ECG Derived Respiration using Complete Ensemble Empirical Mode Decomposition with Adaptive Noise and Principal Component Analysis”, Biomedical Signal Processing and Control, (Elsevier Science publication) , 77 (2022) 103716
- 6 S Dhar, A. Chakraborty,D. Sadhukhan, S. Pal, M. Mitra, “Effortless detection of premature ventricular contraction using computerized analysis of photoplethysmography signal”, Sadhana, Springer, January 2022
- 7 R Paul, M Mitra, AK Pradhan, M Maiti, S Mondal, K Bhattacharyya, SK Biswas, KP Ghatak, “On the Effective Electron Mass in Quantum-Confined THz Materials”, Terahertz Wireless Communication Components and System Technologies, Springer, Singapore,2022, pp. 37-44
- 8 A.Paul, A. Chakraborty, D. Sadhukhan, S.Pal, M. Mitra, ”EEG Based Automated Detection of Six Different Eye Movement Conditions for Implementation in Personal Assistive Application”, Wireless Personal Communications, Springer, January 2022.

2021

- 9 A. Chakraborty, D. Sadhukhan, M. Mitra, “Accurate detection of Dicrotic notch from PPG signal for telemonitoring applications”, International Journal of Biomedical Engineering and Technology (IJ BET), (Inderscience Publication) , Vol. 37, No. 2, 2021

2020

- 10 D. Sadhukhan, S Dhar, S. Pal, M. Mitra, "Automated Screening of Myocardial Infarction based on Statistical Analysis of Photoplethysmographic data", IEEE Transactions on Instrumentation and Measurement, Volume: 69, Issue: 6, June 2020, pp 2881 - 2890
- 11 A. Chakraborty, D. Sadhukhan, S. Pal, M. Mitra, "Automated Myocardial Infarction identification based on interbeat variability analysis of the Photoplethysmographic data" Biomedical Signal Processing and Control, (Elsevier Science publication) , vol. 57 pp. 153-165, 2020
- 12 B. Halder, S. Mitra, M. Mitra, "Healthcare Automation System by Using Cloud-Based Telemonitoring Technique for Cardiovascular Disease Classification", International Journal of Web-Based Learning and Teaching Technologies, vol. 15, issue 2, pp 46-63, April 2020
- 13 A. Chakraborty, D. Sadhukhan, S. Pal, M. Mitra, "PPG based automated estimation of blood pressure using patient specific Neural Network modeling", Journal of Mechanics in Medicine and Biology, vol. 20 , n0 6 (2020) (25 pages).
- 14 S Chakraborty, M Mitra, S Pal, "Geometric retrieval algorithm-based ear biometry with occluded images", International Journal of Biometrics 12 (3), 247-268, 2020
- 15 S Das, S Pal, M Mitra, "Acoustic Feature Based Unsupervised Approach of Heart Sound Event Detection ", Computers in Biology & Medicine, (Elsevier Science publication) , vol. 126, november 2020.
- 16 J Pal, PK Das, M Mitra, KP Ghatak, " Electron energy spectra in quantized structure", Journal of Mathematical Sciences & Computational Mathematics, vol. 1, isswue 4, pp 374-438, 2020

2019

- 17 S Sarkar, P Bhattacharyya, M Mitra, S Pal, "A novel approach towards non-obstructive detection and classification of COPD using ECG derived respiration", Australasian physical & engineering sciences in medicine, Springer International Publishing , 2019, pp. 1-14
- 18 D. Sadhukhan, S. Pal, M. Mitra, " Adaptive Band Limit Estimation based PPG data compression for portable home monitors", Measurement, 134, 2019 , pp.153-165, (Elsevier Science publication)
- 19 S Das, S Pal, M Mitra, "Supervised model for Cochleagram feature based fundamental heart sound identification", Biomedical Signal Processing and Control, 52, 2019 , pp.32-40, (Elsevier Science publication)
- 20 A. Chakraborty, D. Sadhukhan, M. Mitra , "An Automated Algorithm to Extract Time Plane Features From the PPG Signal and its Derivatives for Personal Health Monitoring Application", IETE Journal of Research, 2019, pp-1-14 (Taylor & Francis publication)
- 21 B Halder, S Mitra, M Mitra , "Classification of Complete Myocardial Infarction Using Rule-Based Rough Set Method and Rough Set Explorer System", IETE Journal of Research, 2019, pp-1-11 (Taylor & Francis publication)
- 22 B Halder, S Mitra, M Mitra, "Development of Cardiac Disease Classifier Using Rough Set Decision System", Emerging Technologies in Data Mining and Information Security (Book), 2019, pp.- 775-785, (Springer, Singapore publication)

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- 23 D. Sadhukhan, S. Pal, M. Mitra, "Automated Identification of Myocardial Infarction Using Harmonic Phase Distribution Pattern of ECG Data", IEEE Transactions on Instrumentation and Measurement, vol. 67, no10, pp. 2303-2313. 2018
- 24 S Dhar, SK Mukhopadhyay, S Pal, M Mitra, "An efficient data compression and encryption technique for PPG signal", Measurement,116, 2018 , pp.533-542, (February, 2018) (Elsevier Science publication)
- 25 R. Paul, M. Mitra, S. Ghatak, B. Chatterjee, J. Pal, and S. Chakrabarti, "Accumulation Layers and Their Screening Lengths", Materials Focus, Vol. 7, pp. 1–15, 2018
- 26 Chatterjee, M. Mitra, J. Pal, and M. Debbarma, "Cross-Fields, Opto-Electronic Materials, Intense Light Waves and the Screening Length", Materials Focus, Vol. 7, pp. 1–7, 2018
- 27 B.Haldar, S.Mitra, M.Mitra, "Automatic feature extraction of ECG signal based on adaptive window dependent differential histogram approach and validation with CSE database", Int. J. Computational Systems Engineering, Vol. 4, Nos. 2/3, 2018, pp. 146-155

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- 28 S Chakraborty, M Mitra, S Pal,"Biometric Analysis using Fused Feature Set from Side Face Texture and Electrocardiogram", IET Science, Measurement & Technology , volume :11, issue :2, pp. 226-233, march 2017
- 29 M.Sahoo, S.Pal, M.Mitra, "Automatic segmentation of accumulated fluid inside the retinal layers from optical coherence tomography images", Measurement,101, 2017 , pp.138-144 (April, 2017) (Elsevier Science publication)
- 30 K.P Ghatak B Chatterjee, N Debbarma, M Mitra, T Datta, "The Two Dimensional Magneto Thermo Power in Ultra Thin Films Under Intense Electric Field", Journal of Nanoscience and Nanotechnology, volume :17, issue :5, pp. 3352-3364 (May 2017)
- 31 M Mitra, TN Sen, T Datta, R Bhattacharjee, LS Singh, KP Ghatak, "Heisenberg's Uncertainty Principle, Intense Electric Field, Heavily Doped Optoelectronic Quantized Structures and the Electron Statistics", Journal of Nanoscience and Nanotechnology , Volume; 17, Issue: 1, Pages: 256-269, 2017
- 32 S Das, S Pal, M Mitra," Arduino based noise robust online heart-rate detection " , Journal of Medical Engineering & Technology , volume : 41, no. 3,, pp.170-178, 2017
- 33 U Maji, M Mitra, S Pal, "Characterization of cardiac arrhythmias by variational mode decomposition techniqu", Biocybernetics and Biomedical Engineering, 37 (2 017) , pp. 578-589

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- 34 S Das, S Pal, M Mitra, "Significance of Exhaled Breath Test in Clinical Diagnosis: A Special Focus on the Detection of Diabetes Mellitus", Journal of Medical and Biological Engineering 36 (5), 605-624, 2016

- 35 S Pal, U Maji, M Mitra, "Characterizing Atrial Fibrillation in Empirical Mode Decomposition Domain", *Journal of Medical and Biological Engineering* 36 (5), 693-703, 2016
- 36 B Chatterjee, S Chakrabarti, SK Sen, M Mitra, KP Ghatak," Influence of Parallel Electric and Magnetic Fields on the Carrier Contribution to the Elastic Constants in Kane Type Semiconductors", *Quantum Matter* 5 (1), 85-98,2016
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- 39 SK Biswas, M Mitra, KP Ghatak, "Thermo Power, Large Magnetic Field, Quantized Structures and All That", *Journal of Nanoengineering and Nanomanufacturing*, 6(1), pp. 63-85,2016

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- 40 H. K. Chatterjee, M. Mitra and R. Gupta, "Real-time detection of electrocardiogram wave features using template matching and implementation in FPGA", *Int. J. Biomedical Engineering and Technology*, Vol. 17, No. 3, pp. 290-313 2015
- 41 M. Mitra, B. Chatterjee and K.P.Ghatak, "2d Einstein Relation In Quantum Wells Under Strong Electric Field" , *Journal of computational and Theoretical nanoscience*, Vol. 12, pp. 1527-1539, 2015
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- 44 D Sadhukhan, S Pal, M Mitra, "Electrocardiogram data compression using adaptive bit encoding of the discrete Fourier transforms coefficients", *IET Science, Measurement & Technology*, 2015
- 45 SK Mukhopadhyay, S Mitra, M Mitra, "A combined application of lossless and lossy compression in ECG processing and transmission via GSM-based SMS", *Journal of medical engineering & technology* 39 (2), 105-122, 2015

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- 46 Swati Banerjee, M. Mitra, "Application of Cross Wavelet Transform for ECG pattern analysis and classification", *IEEE Transactions on Instrumentation and Measurement* Vol. . 63, NO. 2, February 2014 Page(s): 326 - 333 , ISSN : 0018-9456 , Digital Object Identifier : 10.1109/TIM.2013.2279001

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- 48 S.Karmakar, S Chattopadhyay, M Mitra, S Sengupta , "Turn-to-turn fault diagnosis of an Induction motor by the analysis of Transient and Steady state Stator current", *Innovative Systems Design and Engineering* Vol. . 5, Issue 2, Page(s) 65-74, 2014.
- 49 SK Ahamed, A Sarkar, M Mitra, S Sengupta, "DSP implementation of a novel envelope analysis approach for the diagnosis of broken rotor bar in induction motor", *International Journal of Modelling, Identification and Control* 22 (3), 275-284, 2014
- 50 SK Ahamed, A Sarkar, M Mitra, S Sengupta, "Induction Machine Stator Inter-Turn Short Circuit Fault Detection using Discrete Wavelet Transform", *Innovative Systems Design and Engineering* Vol. . 5, Issue 1, Page(s)75-82, 2014
- 51 Deboleena Sadhukhan, Rohit Mitra, Avik Kundu, M. Mitra, "Development of a Low Cost ECG DataAcquisition Module", *International Journal of Innovative Research in Science, Engineering and Technology*, vol.3 ,sp. Issue 2, February 2014, pp. 1-9
- 52 S. K. Mukhopadhyay, S.Mitra and M.Mitra, "A Combined Application of Lossless and Lossy compression in ECG Processing and Transmission via GSM based SMS", *Journal of Medical Engineering and Technology (Informa Healthcare)*, ISSN: 0309-1902 (print), 1464-522X (electronic), DOI: 10.3109/03091902.2014.990159, Early Online: 1–18

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- 55 S. K. Mukhopadhyay, S.Mitra, M.Mitra, "ECG Signal Compression Using ASCII Character Encoding and Transmission via SMS", *Biomedical Signal Processing and Control* , 8 (2013) pp. 354– 363 (Elsevier Science Publication).
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- 64 R.Gupta, J.N.Bera, **M.Mitra**, "An intelligent telecardiology system for offline wireless transmission and remote analysis of ECG", *Journal of Medical Engineering & Technology (Informa Healthcare)* 36 (7) , pp. 358-365, 2012
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- 66 S. Pal, **M. Mitra**, "Increasing the accuracy of ECG based biometric analysis by data modelling", *Measurement*, 45 (7), 2012 , pp.1927-1932 (August 2012) (Elsevier Science publication)
- 67 R. Gupta, J.N. Bera, **M. Mitra** ,"A Bi-Phase Enabled Serial Acquisition System for Remote Processing of Digitized ECG" *Computers & Electrical Engineering*, 38, PP. 68-74, (2012) (Elsevier Science publication)
- 68 Saurabh Pal, **Madhuchhanda Mitra**, "Empirical Mode Decomposition based ECG enhancement and QRS Detection", *Computers in Biology and Medicine*, vol.42, issue 1, pp.83-92, January 2012 (ELSEVIER science publication).
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- 89 R.Gupta, J.N.Bera, ,**M.Mitra**, " Remote ECG acquisition: Towards Distributed Healthcare.", Accepted in International Journal of Recent Trends in Engineering (Academy Publishers, Finland), Vol. 4, No. 1, pp. 24-28, November 2010 [ISSN 2158-5563].
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- 25 S.Mitra, **M.Mitra**& B.B.Chaudhuri, “ A simple tele-cardiology system for ECG-data transmission and abnormality detection”, Proc.West Bengal state science & Technology Congress, 28-29 February 2004, pp.69
- 26 **M.Mitra**, D.K.Basu and D.Basu, “On some efficiency factors in photovoltaics,” Proceedings of the seminar on Development of Sustainable Energy Systems etc., Institute of Engineers (I), Calcutta, 1997.
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- 33 **M.Mitra**, A.K.Mukhopadhyay & D.Basu, "Microprocessor based on line frequency monitoring and system protection beyond permissible limit." Proceedings of All India seminar on Recent Development in Electrical Standards and Standardisation, at Calcutta, Jan. 30-31 1988. Organised by Electrical Engg Div. West Bengal State Centre, The Institution of Engineers (India).

List of Books

International Book : 9

1.Heisenberg's Uncertainty Principle and the Electron Statistics in Quantized Structures, Springer Nature, ISBN 9811698449, 9789811698446, 234 pages, 25th March 2022.

2. Elastic Constants in Heavily Doped Low Dimensional Materials, Series on the foundation of Natural Science and Technology – vol 14, World Scientific, ISBN 978-981-122-946-6 (Hardcover), 974 pages, 15th March 2021.

3. Nanomaterials, Volume 2: Quantization and Entropy, De Gruyter, ISBN 9783110661194, DOI: 10.1515/9783110661194, 450 pages, 6th April 2020.

4. Nanomaterials, Volume 1: Electronic Properties, De Gruyter, ISBN 978-3-11-060922-6, e-ISBN (PDF) 978-3-11-061081-9, e-ISBN (EPUB) 978-3-11-060935-6, 364 p, 2019

5. "Induction Motor Fault Diagnosis, Approach through Current Signature Analysis" Series: Power Systems, Springer, 104 p., Hardcover, ISBN 978-981-10-0623-4

6. "ECG Acquisition and Automated Remote Processing" Springer, 131 p., Hardcover, ISBN: 978-81-322-1556-1 (Print) 978-81-322-1557-8 (Online)

7. "Electric Power Quality ", Series: Power Systems, Springer, 300 p., Hardcover, ISBN: 978-94-007-0634-7

8. International Edition of "Programmable Logic Controllers And Industrial Automation: An Introduction ISBN: 81-87972-21-1, Penram International, Mumbai, 2005

9. Time Plane, Feature Extraction of ECG wave and Abnormality Detection: With MATLAB program Paperback – January 11, 2012, Lambert Academic Publishings (LAP), Germany, ISBN-13: 978-3-847339779, ISBN-10: 384733977X, EAN: 9783847339779

Book Chapter :

21st Century Nanoscience–A Handbook

The Gate Capacitance of MOS Field Effect Devices, pp. 19-1-19-8, CRC Press, 2020

Quantum Dots and Quantum Cellular Automata: Recent Trends and Applications From Nova Science Publishers, Inc (USA).

Chapter 1. On The Einstein's Photoemission from Quantum Dots and Quantum Dot Super Lattices of Non Parabolic Semiconductors: Simplified Theory and Relative Comparison

Chapter 2. Influence of Microwaves on the Photoemission from Quantum Dots and Quantum Dot Super Lattices of Opto-Electronic Materials

Chapter 3. Seebeck Coefficient in Quantum Dots and Quantum Dot Super Lattices of Heavily Doped Semiconductors under Large Magnetic Field

National level book :1

. "Programmable Logic Controllers And Industrial Automation: An Introduction (For Graduate, Postgraduate levels of engineering, Researchers and Practicing Engineers) ISBN: 81-87972-17-3 , Penram International, Mumbai, 2005

Research Projects Carried Out				
SI No.	Title of the project	Name of the Funding agency	Duration	Status Completed/ongoing
1	Modernisation of process control and instrumentation laboratory	AICTE	1998-2000	Completed
2	Design and development of a multipurpose solar still	DST (West Bengal)	1996-1998	Completed
3	FIST Program 2009	DST	2010-2015	Completed

Evidence of Research

Ph. D. awarded

Sl. No.	Title of Thesis	Name of candidate	Affiliation	Name(s) of Supervisor(s)	Year of Award
1	Biomedical signal extraction and processing for digital time database generation and abnormality detection	Sucharita Sarkar (Mitra)	Assistant Professor Department of Electronics, Netaji Nagar Day College	Dr. M. Mitra	2005
2	Electric Power Quality in Power System	Surajit Chattopadhyay	Associate Professor Electrical Engg. Dept. Ghani Khan Choudhury Institute of Engineering & Technology	Prof. S. Sengupta Dr. M. Mitra	2010
3	An approach to Develop A	Rajarshi Gupta	Faculty of the	Dr. M.Mitra	2012

	method for Automated Remote Monitoring & Analysis of ECG using Smart Wireless telecardiology System		Department	Dr. J.N.Bera	
4	Investigation on classification of electrocardiogram signals using time frequency model based feature extraction and pattern recognition by artificial intelligence technique for disease identification and biometric analysis	Saurabh Pal	Faculty of the Department	Dr. M.Mitra	2013
5	Application of soft computing techniques for analysis and classification of biomedical signals.	Swati Banerjee	Sorbonne University, France	Dr. M. Mitra	2014
6	An Approach to Develop a Remote Tele-cardiology System for Compression, Transmission and Analysis of ECG Signal	Saurav Mukhopadhyay	Department of Electrical, Computer, and Biomedical Engineering, Ryerson University, Canada	Dr. M. Mitra Dr.S.Mitra	2015
7	Induction Motor Fault Detection through Soft Computing Techniques	Subrata Karmakar	Assistant Secretary UCSTA, University of Calcutta	Prof. S. Sengupta Dr. M. Mitra	2015
8	ECG Feature Extraction and Signal Processing using Standalone Embedded Systems	Harekrishna Chattopadhyay	Assistant Professor UEM	Dr. M. Mitra Mr. R.Gupta	2016
9	Power System Fault Analysis through Soft Computing Techniques	Syed Kamaluddin Ahmed	Associate Professor Govt. college of Engg. & Textile Technology	Prof. S. Sengupta Dr. M. Mitra	2017
10	Characterization and Classification of Cardiac Episodes using Data Adaptive Techniques	Uday Maji	Associate Professor Haldia Inst. Of Tech., WBUT	Dr. S. Pal, Dr. M. Mitra	2018
11	Application of soft computing techniques for compression, analysis and classification of cardiac signals	Basudev Halder	Neotia Institute of Technology Management and Science	Dr.M.Mitra, Dr.S.Mitra	2020
12	Compression and Analysis of Cardiac Signals	Debolina Sadhukhan	Post Doctoral Researcher Institut Langevin Université de Paris	Dr. M.Mitra, Dr.S.Pal	2020

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	Design and Development of Some Modified Transducers of Process Variables	Haraprasad Mandal	Assistant Professor, Saroj Mohan Institute of Technology, Guptipara, Hooghly.	Prof.S.C.Bera Prof. M.Mitra	2022

Ph. D. registered

Sl. No.	Title of Thesis	Name of candidate	Affiliation	Name(s) of Supervisor(s)
1	Studies on Multimodal Biometric Analysis for Personalized Authentication (Thesis submitted)	Samik Chakraborty	Assistant Professor Heritage Inst. Of Tech., WBUT	Dr. S. Pal, Dr. M. Mitra
2	An Investigation on Volatile Organic Compound based gas analysis and its application	Souvik Das	Assistant Professor JIS Kalyani	Dr. M.Mitra, Dr.S.Pal
3	Assistive technologies for automated cardiac abnormalities detection (Thesis submitted)	Sangita Das	CSIR project fellow	Dr. M.Mitra, Dr.S.Pal
4	Acquisition, processing and analysis of some biomedical signal	Abhishek Chakraborty	Research Scholar	Dr. M.Mitra
5	Bio-signal acquisition, compression, encryption and classification	Sandipan Dhar	TEQIP project fellow	Dr. M.Mitra, Dr.S.Pal
6	Study of Optical Coherence Tomography Images for analysis of Eye conditions	Moumita Sahoo	Assistant Professor Haldia Inst. Of Tech., WBUT	Dr. S. Pal, Dr. M. Mitra
7	Studies on Signal based alternative methodologies for characterization of obstructive lung diseases	Surita Sarkar	CSIR project fellow	Dr. S. Pal, Dr. M. Mitra
8	Development of automated methodologies for the analysis of some	Avishek Paul	Assistant Professor RCC Inst. Of	Dr. M.Mitra, Dr.S.Pal

	biomedical signals.		Tech., WBUT	