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Institute of Radio Physics & Electronics  
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**Education:**

**Ph.D** in Engineering, Jadavpur University, 2001

**M.Tech** in Radio Physics & Electronics, University of Calcutta, 1996

**B.Tech** in Radio Physics & Electronics, University of Calcutta, 1994

**Professional Experience:**

1. Associate Professor: Sept 2014 – Present  
Institute of Radio Physics & Electronics  
University of Calcutta, West Bengal, India

2. Assistant Professor: Dec 2005 – Aug 2014  
Institute of Radio Physics & Electronics  
University of Calcutta, West Bengal, India

3. Associate Professor: January 2004- Dec 2005  
College of Engineering & Management, Kolaghat, West Bengal, India

4. Senior Lecturer: 2003-2004  
Haldia Institute of Technology, West Bengal, India

5. Lecturer: July, 1999-2003  
Birla Institute of Technology, Deemed University, Ranchi, Jharkhand, India

**Awards and Affiliations:**

Institute of Electrical and Electronics Engineers (IEEE), Member  
IEEE Women in Engineering, Member  
The Institute of Engineers(I), Member  
Indian Society of Technical Education Member  
FOSET, Life Member

**Research Interest:**

Signal processing applications in genomics, Digital Signal Processing Applications in Disease diagnosis, Circuits modelling for amino acids , protein and DNA, Synthetic Biological Circuit Design, Embedded processing and IoT application in HealthCare.

**PUBLICATIONS in JOURNALS**

1. "Prediction of Cancer Cell using Digital Signal Processing", **S.Barman(Mandal)**, M.Roy, S.Biswas, S.Saha, Annals of Faculty Engineering Hunedoara, International Journal of Engineering , Tome IX (Year 2011), 1584-2673, Pp 91-95.
2. "Spectral Analysis of coding and Non-coding regions of a DNA sequence by Parametric and Non-parametric Methods", M.Roy, **S.Barman(Mandal)**, Annals of Faculty Engineering, Hunedoara, International Journal of Engineering , Tome IX (Year 2011), 1584-2673, Pp 57-62.
3. "Application of Principal Component-Minimum Variance Technique in Gene Prediction" , M.Roy , **S. Barman**, Review of Applied Physics Journal, Vol2., issue 2,pp,2012.
4. "Effective gene prediction by high resolution frequency estimator based on least norm solution technique" M.Roy, **S. Barman**, EURASIP J. on Bioinformatics and System Biology", 2014:2,pp 1-13,doi: 10.1186/1687-4153-2014-2.ISSN. No. 1687-4153. 4th January,2014.
5. "A behavioral study of healthy and cancer genes by modeling electrical network" T.Roy ,**S. Barman**, Elsevier, Gene, vol 550, pp 81-92, oct,2014, , ISSN: 0378-1119, **Impact Factor: 2.246**
6. "Modelling and Characterization of Amino Acids Using MOS Technology" S.Saha, S.Barman, International Journal of Computer Applications in Engineering Sciences (IJCAES) , Vol.4, Sept,2014,ISSN: 2231-4946
7. "Design and development of Cancer Regulatory System by modeling electrical network of gene " T.Roy, **S. Barman**, Springer Journal of Microsystem Technologies -2015, DOI: 10.1007/s00542-015-2548-x, 0946-7076, November 2016, IF 1.5
8. "Performance Analysis of Network Model to Identify Healthy and Cancerous Colon Genes" T.Roy, **S. Barman**,IEEE Journal of Biomedical and Health Informatics, 2015, DOI 10.1109/JBHI.2015.2408366, **IF 3.45**
9. " Application of BT and PC-BT in Homo sapiens gene prediction" A.Ghosh, **S.Barman**, Springer Journal of Microsystem Technologies ,2015, DOI: 10.1007/s00542-015-2573-9, IF 1.5
10. "Realization Of a EVD Model in LABVIEW Environment for Identification of Cancer and Healthy Homo Sapiens", Antara Ghosh, Soma Barman, Annals of Faculty Engineering Hunedoara, International Journal of Engineering , Tome XIII [2015] – Fascicule 2 [May], ISSN: 1584-2665 ,pp 195-201.
11. "CA based Area Optimized Three Bytes Error Detecting Codes", JAGANNATH SAMANTA, JAYDEB BHAUMIK, SOMA BARMAN, Journal of Cellular Automata;2015, Vol. 10, p409 ,June,2015 , 1557-5969,IF 0.698
12. " Bayesian Fusion in Cancer Gene Prediction" J.Das , S.Barman, International Journal of Computer Applications , ISSN No. - 0975 – 8887, 2015.

13. "Improved gene prediction by principal component analysis based autoregressive Yule-Walker method" Manidipa Roy, Soma Barman, elsevier Gene, <http://dx.doi.org/10.1016/j.gene.2015.09.0230378-1119>/© 2015 Published by Elsevier B.V., **Sept,2015, IF- 2.258.**
14. "Modified Karatsuba Multiplier for Key Equation Solver in RS Code" Jagannath Samanta, Jaydeb Bhaumik and **Soma Barman**, ISSN 0735-2727, Radioelectronics and Communications Systems, 2015, Vol. 58, No. 10, pp. 452–461, 19th May, 2015.
15. "Codon Characterization Based on Electrical Response", M.Dutta, S.Barman International Journal of Computer Applications, ISSN No. 0975 – 8887, 28th Dec,2015.
16. "Polyphase Filtering with Variable Mapping Rule in Protein Coding Region Prediction", ,S.Singha Roy & **S. Barman** , Springer Journal of Microsystem Technologies, ISSN 0946-7076, Vol.23, No. 9, **IF = 1.5**, 19th Feb, 2016.
17. " Application of Euclidean Distance Measurement and Principal Component Analysis for Gene Identification ", A. Ghosh, **S.Barman**, Elsevier, Gene, 7th,February, 2016, DOI : 10.1016/j.gene.2016.02 , **IF- 2.258**
18. "Prediction of Breast Cancer Gene Using Electrical Network Model", Tanusree Roy and **Soma Barman**, ANNALS of Faculty Engineering Hunedoara, International Journal of Engineering, ISSN: 1584-2665, Issue- February,2016.
19. " A Transistor Level Implementation of Reed Solomon Encoder in GF(28)" , Jagannath Samanta, Madhuresh Suman, Jaydeb Bhaumik and **Soma Barman**, J. of Active and Passive Electronic Devices, Vol. 11, pp. 1–19,2016
20. Modeling of Cancer Classifier to Predict Site of Origin , Tanusree Roy and **Soma Barman**, January 2016 · IEEE Transactions on NanoBioscience ,July,2016; DOI:10.1109/TNB.2016.2573319 , **IF 1.969**
21. DSP Based Entropy Estimation for Identification and Classification of Homo sapiens Cancer Genes , Joyshri Das and **Soma Barman**, June 2016 · Springer Journal of Microsystem Technologies June,2016, **IF =1.5** ,DOI : 10.1007/s00542-016-3056-3
22. "FPGA based Area Efficient RS(23, 17) Codec", Jagannath Samanta, Jaydeb Bhaumik and **Soma Barman**, Microsystems Technologies (Springer), DOI: 10.1007/s00542-016-3058-1, 7th July, 2016 **IF = 1.5.**
23. "Prediction of Homo sapiens cancer cells by electrical network modeling of amino acid sequence" T.Roy, **S. Barman**, International Journal of Bioinformatics Research and Applications , 2016, DOI 10.1504/IJBRA.2017.082057.
24. " A novel approach to reduce computational load in least norm super resolution gene predictor", Manidipa Roy and **Soma Barman**, International Journal of Data Mining and Bioinformatics, Vol. 16, No. 3, 2016 , Nov,2016, [doi.org/10.1504/IJDMB.2016.080672](https://doi.org/10.1504/IJDMB.2016.080672) , , **3rd Jan,2016, IF 0.717**
25. "FPGA and ASIC Implementation of RS(47, 41) Codec for Intelligent Home Networking System", J. Samanta, J. Bhaumik and **S. Barman**, Journal of Active & Passive Electronic Devices (**Emerging SCI**) **2017**, ISSN : 1555-0281, pp 1-19 .
26. Compact CA-based single byte error correcting codec", J. Samanta, J. Bhaumik and **S. Barman**, IEEE Transactions on Computers, DOI: 10.1109/TC.2017.2739726 , ISSN :0018-9340, Vol. PP, Issue: 99 .August,2017, , **IF= 2.916.**
27. "Jagannath Samanta, Jaydeb Bhaumik and **Soma Barman**, "Compact and Power Efficient SEC-DED Codec for Computer Memory", Microsystems Technologies (Springer)(SCI, under review).IF 1.581
28. " A non-invasive cancer gene detection technique using FLANN based adaptive filter", Saikat Singha Roy and **Soma Barman**", Springer Microsystem Technologies <https://doi.org/10.1007/s00542-018-4036-6>, July 2018, **IF= 1.5**
29. "Identification of Homo sapiens cancer classes based on fusion of hidden gene features", Joyshri Das and **Soma Barman (Mandal)**, Journal of Biomedical Informatics, Vol 110, October 2020, DOI : <https://doi.org/10.1016/j.jbi.2020.103555>, **IF 3.52**
30. "Intelligent Remote Health Monitoring System", Samik Basu, Mahasweta Ghosh, **Soma Barman(Mandal)**, Publisher Int. J. Information Technology, Communications and Convergence, Inderscience, Vol. 3, No. 4, pp259-274, 2020 .

### **Book Chapter :**

1. "Behavioral Modeling of Differential Inductive Seismic Sensor and Implementation of Its Readout Circuit" Abhishek Kumar Gond, Rajni Gupta, Samik Basu, Soumya Pandit and **Soma Barman**, Springer Nature Singapore Pte Ltd. 2017, Communication, Devices, and Computing, Lecture Notes in Electrical Engineering 470, [https://doi.org/10.1007/978-981-10-8585-7\\_24](https://doi.org/10.1007/978-981-10-8585-7_24), pp 253-262, 8th April, 2018.
2. "RS (255, 249) Codec Based on All Primitive Polynomials Over GF(2<sup>8</sup>)" Jagannath Samanta, Jaydeb Bhaumik, **Soma Barman**, Sk. G. S. Hossain, Mandira Sahu and Subrata Dutta, Springer Nature Singapore Pte Ltd. 2017, Communication, Devices, and Computing, Lecture Notes in Electrical Engineering 470, [https://doi.org/10.1007/978-981-10-8585-7\\_14](https://doi.org/10.1007/978-981-10-8585-7_14), 8th April, 2018, pp-151-161
3. " Binary Error Correcting Code for DNA Databank" Jagannath Samanta, Jaydeb Bhaumik, **Soma Barman** and Raj Kumar Maity, Springer Nature Singapore Pte Ltd. 2017, Communication, Devices, and Computing, Lecture Notes in Electrical Engineering 470, [https://doi.org/10.1007/978-981-10-8585-7\\_1](https://doi.org/10.1007/978-981-10-8585-7_1), 8th April, 2018, pp 1-12
4. "Electrical Equivalent Model for Gene Regulatory System" , Dutta M., **Barman S.** (2018) Lecture Notes in Electrical Engineering, vol 453. Springer, Singapore, [doi.org/10.1007/978-981-10-5565-2\\_14](https://doi.org/10.1007/978-981-10-5565-2_14) , Print ISBN 978-981-10-5564-5 , Online ISBN 978-981-10-5565-2 .pp-151-169.
5. "Design of a Low-Cost Heart Rate Monitoring System." Nandy S., **Barman S.** (2018) ,Lecture Notes in Electrical Engineering, vol 453. Springer, Singapore, DOI [https://doi.org/10.1007/978-981-10-5565-2\\_19](https://doi.org/10.1007/978-981-10-5565-2_19) , Print ISBN 978-981-10-5564-5 , Online ISBN 978-981-10-5565-2 , pp 207-219.
6. "Identification of Protein Coding Region of DNA Sequence Using Multirate Filter" S. Singha Roy, **S. Barman** , Computational Advancement in Communication Circuits and Systems ,Springer Lecture Notes in Electrical Engineering Volume 335, 2015, pp 131-137 18 Mar 2015
7. "COMPACT RS(32, 28) ENCODER" Jagannath Samanta, Jaydeb Bhaumik, and **Soma Barman**, International conference on Intelligent Computing and Applications, Springer Book, Advances in Intelligent Systems and Computing Volume 343, 2015, ISBN :978-81-322-2268-2, pp 89-95
8. Electrical Network Modeling of Amino Acid String and its Application in Cancer Cell Prediction", T.Roy, S.Das, **S.Barman**, Springer book on Advances in Intelligent Systems and Computing Volume 243 ,June 2013, ISBN 978-81-322-1664-3, ISBN 978-81-322-1665-0, DOI 10.1007/978-81-322-1665-0.
9. "Prediction of Prostate Cancer cells Based on Principal Component Analysis technique", A. Ghosh, **S.Barman**, Elsevier Procedia Technology 10 ( 2013 ) , ISSN: 2212-0173, 37 – 44.

### **Some recent Conference Publications:**

- "Identification of some Transposable Elements of DNA using 'BP Suche' Algorithm", Rachita Ghoshhajra, Sanghamitra Chatterjee, **Soma Barman Mandal** ,International Conference on Computational Intelligence in Pattern Recognition (CIPR 2019),Indian Institute of Engineering Science and Technology, Shibpur, 19th-20th January 2019
- "Smart Health Monitoring System for Temperature, Blood Oxygen Saturation and Heart Rate Sensing with Embedded Processing and Transmission using IoT platform", Samik Basu, Sinjoy Saha,Soumya Pandit, **Soma Barman (Mandal)**, International Conference on Computational Intelligence in Pattern Recognition (CIPR 2019),Indian Institute of Engineering Science and Technology, Shibpur, 19th-20th January 2019
- " Design of a Health Monitoring System for Heart Rate and Body Temperature Sensing Including Embedded Processing using ARM Cortex M3", Mahasweta Ghosh, Samik Basu, Soumya Pandit, **Soma Barman(Mandal)**, International Conference on Computational Intelligence in Pattern Recognition (CIPR 2019-20th January 2019.
- " Raspberry PI 3B+ Based Smart Remote Health Monitoring System using IoT Platform", Samik Basu, Mahasweta Ghosh, **Soma Barman(Mandal)**, 2nd International Conference on Communication, Devices and Computing (ICCDC 2019),HIT, Haldia, March 14-15, 2019
- " Peltier Module Based Water Generation and Waste Heat Management System" Trisha Patra, Samik Basu, **Soma Barman (Mandal)**, 2nd International Conference on Communication, Devices and Computing (ICCDC 2019),HIT, Haldia, March 14-15, 2019
- " Study of Evolution by Searching Alu Pattern from Primate Transposon" Rachita Ghoshhajra ,Sanghamita Chatterjee, **Soma Barman Mandal**, 2nd International Conference on Communication, Devices and Computing (ICCDC 2019),HIT, Haldia, March 14-15, 2019

#### RESEARCH CITATIONS

<i>First Publication in 2009</i>	<i>Google Scholar</i>
<i>H- index</i>	9
<i>Total Citation</i>	222

#### Ph.D. Supervised

1. Manidipa Roy " Prediction & Analysis of Protein Coding Region IN DNA Sequence Using Digital Signal Processing Techniques ".-- Degree awarded on 23rd Sept, 2016
2. Tanusree Roy " Electrical Network Modeling of Amino Acid Sequence of Homo Sapiens Genes" --- Degree awarded on 3rd July,2017 -.
3. Jagannath Samanta " Design and Implementation of Error Correcting Codes" - --Degree awarded on 5th Dec,2018
4. Antara Ghosh " Statistical Signal Processing Based Approaches for Identification and Classification of Some Cancerous Genes " completed -5000 Seminar on 4th August,2020

#### Current Ph.D. Students

1. Joyshri Das - Application of Fusion Technology in Genomics
2. Saikat Singha Roy - Digital Filtering Approach in Genomics
3. Mala Sahoo Giri – Modeling of Gene Regulatory Network using Boolean Network
4. Trisha Patra - Cytomorphic Circuit Modeling of P53 Pathway
5. Mahasweta Ghosh – Embedded Processing and AI in HealthCare Application

### **Sponsored Projects :**

#### **Completed projects :**

1. Sponsored Project by Centre for Research for Nano-science & Nano-technology (CRNN), CU,  
Project Title "Electrical Circuit Model of DNA/RNA string and their simulation in a SPICE framework "  
- 2 lakhs +1 SRF (2012- 2013)
2. Sponsored Project by SERB, DST, Govt. of India , Project title " Electrical Network Modelling of Biological System & its applications in Genetic Disease Diagnosis - 31 Lakhs (2013-2017)
3. Funded by University with Potential for Excellence, Calcutta University, UPE II Modern Biology and Signal Processing Group, Project Title "Development of Low Cost, Prototype Electronic System for Health Monitoring"- 4.5 lakhs, (2017-2019)

#### **Current projects :**

1. Sponsored Project by West Bengal Higher Education , Science & Technology and Biotechnology (Sci & Tech.), Govt. of West Bengal, Project Title " Cytomorphic CMOS Circuit Modeling and Ultra -Low Power Design of P53 Protein Pathway for Synthetic Biology Applications" - 12.9 Lakhs (2018-2021)

### **Teaching:**

- **B.Tech ECE** : Digital Communication System, Instrumentation & Measurement
- **M.Tech** : Advanced Communication, Embedded System

### **Academic Responsibilities:**

- Undergraduate and postgraduate level teaching (theory and laboratory) as per University of Calcutta curriculum at Institute of Radio Physics and Electronics, 2005 (Dec-onwards)
- Teacher –In Charge of Digital Communication Laboratory for under graduate level
- Teacher – in Charge of Embedded Processing & IOT research laboratory.
- Teacher-In Charge (jointly) of Electronic Instrumentation and Measurement teaching laboratory for under graduate level
- Member of the Board of Studies in Electronics and Communication Engineering and Board of Post Graduate Studies in Radio Physics & Electronics.

- Member of Admission and Selection Committee for M.Tech students admission.
- Member and Coordinator of M.Tech admission and selection Committee
- Member of the Departmental Committee.