



## SUMITRA MUKHOPADHYAY

Assistant Professor, Stage-III

Institute of Radio Physics and Electronics, University of Calcutta

### OBJECTIVE

To strive for excellence in the field of teaching and research with dedication, focus, proactive approach, positive attitude and passion. To progress dynamically, update the knowledge and enhance skills, in the state-of-the-art teaching and research. To contribute to the society with the application of advanced technology.

### RESEARCH INTEREST

- Machine learning
- Artificial Intelligence
- Bio-inspired computing
- Bio-medical signal processing
- FPGA based prototyping

### CONTACT

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### PRESENT RESEARCH PROJECT

- Affordable Wearable Cardiac Monitor for Early Detection, Monitoring and Prevention of Arrhythmia for elderly citizens, R&D project by Regional Geriatric Centre, Medical College Kolkata, Memo no. MC/4982/09/2022, September 2022.

### PAST RESEARCH PROJECT AND CHALLENGE

- Mobile Broadband Service Support over Cognitive Radio Networks, ITRA, Ministry of Communications and Information Technology vide letter no. ITRA/15(63)/Mobile/MBSSCRN/01 dated Sep19, 2013, Date of sanction: September 19, 2013, Period: September, 2013 to December,2018, Total Grant: Rs.137.56 Lakhs (IRPE, CU), Acted as Co-PI.
- Swadeshi Microprocessor Challenge, Ministry of Electronics & Information Technology, Government of India, started from 18.08.2020, Duration:1year, Acted as Team leader.

### PRESENT COLLABORATIONS

- Medical College Kolkata
- Applied Physics Department, University of Calcutta

### THESIS GUIDANCE

- Three candidates registered
- One candidate submitted the thesis, presently under review

### CONTRIBUTION IN LABORATORY SETUP

- IoT and Sensor Laboratory

## SELECTED PUBLICATIONS IN JOURNAL

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1. Debasmita Pal, **Sumitra Mukhopadhyay**, and Rajarshi Gupta. "Two-stage Classifier for Resource Constrained On-board Cardiac Arrhythmia Detection." *IEEE Transactions on Instrumentation and Measurement* (2022) IF: 5.332, ([10.1109/TIM.2022.3224535](https://doi.org/10.1109/TIM.2022.3224535)).
2. Nabanita Banerjee and **Sumitra Mukhopadhyay**. "AP-TLB-IGWO: Adult-pup teaching-learning based interactive grey wolf optimizer for numerical optimization." *Applied Soft Computing* (2022): 109000, ISSN 1568-4946, IF: 8.263 (<https://doi.org/10.1016/j.asoc.2022.109000>).
3. Prativa Agarwalla and **Sumitra Mukhopadhyay**, "GENEmops: Supervised feature selection from high dimensional biomedical dataset," *Applied Soft Computing*, 2022, 108963, ISSN 1568-4946, IF: 8.263, (<https://doi.org/10.1016/j.asoc.2022.108963>).
4. Nilava Mukherjee, **Sumitra Mukhopadhyay**, and Rajarshi Gupta. "Real-time mental stress detection technique using neural networks towards a wearable health monitor." *Measurement Science and Technology* 33.4 (2022): 044003, IF: 2.046.
5. Pratyush Prasun, **Sumitra Mukhopadhyay**, and Rajarshi Gupta. "Real-time multi-class signal quality assessment of photoplethysmography using machine learning technique." *Measurement Science and Technology* 33.1 (2021): 015701, IF: 2.046.
6. P. Agarwalla, and **Sumitra Mukhopadhyay**, (2020). Hybrid advanced player selection strategy-based population search for global optimization. *Expert Systems with Applications*, 139, 112825. IF:8.665 (<https://doi.org/10.1016/j.eswa.2019.112825>).
7. Soumyadip Das and **Sumitra Mukhopadhyay**, (2018). FIL-DGA based hardware optimization system. *Applied Soft Computing*, 72, 235-260. IF: 8.263, (<https://doi.org/10.1016/j.asoc.2018.07.037>).
8. Prativa Agarwalla and **Sumitra Mukhopadhyay** (2018). "Bi-stage hierarchical selection of pathway genes for cancer progression using a swarm based computational approach." *Applied Soft Computing* 62: 230-250. IF: 8.263, (<https://doi.org/10.1016/j.asoc.2017.10.024>).
9. Prativa Agarwalla and **Sumitra Mukhopadhyay** (2017). "Efficient player selection strategy based diversified particle swarm optimization algorithm for global optimization." *Information Sciences* 397 (2017): 69-90. IF:8.233 (<https://doi.org/10.1016/j.ins.2017.02.027>).
10. Samiran Banerjee and **Sumitra Mukhopadhyay**. "A low cost and fast controller architecture for multimedia data storage and retrieval to flash-based storage device." *EURASIP Journal on Embedded Systems* 2016.1 (2017): 1-26.

## SELECTED PUBLICATIONS IN BOOK CHAPTERS

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1. Nabanita Banerjee and **Sumitra Mukhopadhyay**. "Modified Multi-Grey Wolf Pack for Vital Sign-Based Disease Identification." *Soft Computing Methods for System Dependability*. IGI Global, 2020. 45-94, ISBN13: 9781799817185.
2. Prativa Agarwalla and **Sumitra Mukhopadhyay**. "Wolf-Swarm Colony for Signature Gene Selection Using Weighted Objective Method." *Nature-Inspired Algorithms for Big Data Frameworks*. IGI Global, 2019. 170-195, ISBN13: 9781522558521.
3. Prativa Agarwalla and **Sumitra Mukhopadhyay**. "Feature selection using multi-objective optimization technique for supervised cancer classification." *Multi-objective optimization*. Springer, Singapore, 2018. 195-213, ISBN 978-981-13-1471-1.
4. **Sumitra Mukhopadhyay** and Soumyadip Das. "Application of Nature-Inspired Algorithms for Sensing Error Optimisation in Dynamic Environment." *Nature-Inspired Algorithms for Big Data Frameworks*. IGI Global, 2019. 124-169, ISBN13: 9781522558521.
5. Prativa Agarwalla and **Sumitra Mukhopadhyay**. "Selection of Pathway Markers for Cancer Using Collaborative Binary Multi-Swarm Optimization." *Applying Big Data Analytics in Bioinformatics and Medicine*. IGI Global, 2018. 337-363.
6. **Sumitra Mukhopadhyay** and Soumyadip Das. "A System on Chip Development of Customizable GA Architecture for Real Parameter Optimization Problem." *Handbook of Research on Natural Computing for Optimization Problems*. IGI Global, 2016. 66-102.

## SELECTED PUBLICATIONS IN CONFERENCES

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1. Sardar, Priya, Rajarshi Gupta, and **Sumitra Mukhopadhyay**. "Multiclass Signal Quality Assessment of Electrocardiogram using Entropy-based Features and Machine Learning Technique." 2022 IEEE Silchar Subsection Conference (SILCON). IEEE, 2022.
2. Pal, Debasmita, **Sumitra Mukhopadhyay**, and Rajarshi Gupta. "A Machine Learning-based Lightweight and Real-time Cardiac Arrhythmia Detection using Optimum Samples and Features." 2022 IEEE 9th Uttar Pradesh Section International Conference on Electrical, Electronics and Computer Engineering (UPCON). IEEE, 2022. (**Best Paper Award in a Track**).
3. Ghosh, Souvik, **Sumitra Mukhopadhyay**, and Rajarshi Gupta. "A New Physiology-based Objective Mental Stress Detection Technique with Reduced Feature Set and Class Imbalanced Dataset Management." 2021 IEEE International Conference on Technology, Research, and Innovation for Betterment of Society (TRIBES). IEEE, 2021.
4. Prativa Agarwalla, and **Sumitra Mukhopadhyay**. "Comparative Analysis of Multi-objective Algorithms for Imbalanced Biomedical Data Classification with Tuned Classifier." 2021 5th International Conference on Information Systems and Computer Networks (ISCON). IEEE, 2021.
5. Nabanita Banerjee, and **S. Mukhopadhyay**. "HC-PSOGWO: hybrid crossover oriented PSO and GWO based co-evolution for global optimization." 2019 IEEE region 10 symposium (TENSymp). IEEE, 2019.

## SUBJECTS TAUGHT

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- Control Theory and Systems
- Microprocessor and Microcontroller
- Processor organization and architecture
- Microprocessor and Microcontroller Laboratory
- Microelectronics and VLSI Laboratory
- Design Entry and Simulation laboratory

## SELECTED ADMINISTRATIVE/TECHNICAL RESPONSIBILITIES (PRESENT)

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- General coordinator of BTech ECE Course of IRPE department.
- Acting as a technical program co-chair in CODEC-2023, organized by Radio Physics and Electronics Department, 14-16 December, 2023, University of Calcutta
- Serving as book reviewer in Translation of 2nd-year Technical Books Project under AICTE Technical Book Writing Scheme (Year:2022 onwards)
- Acting as a **member of Board of Moderator** in St. Xaviers College since 2014
- Acting as **external examiner** in St. Xaviers College since 2014

## EDUCATIONAL ACHIEVEMENT

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- PhD. (Engg), Jadavpur University, 2009
- M.E. Tel. E, Jadavpur University, 2004
- BTech in ECE, Kalyani University, 2002
- **University Medal** received for securing **First Position** in Master of Electronics and Telecommunication Engineering, Jadavpur University, 2004
- **Sarojini Radhakanta Majumdar memorial gold medal** received in Master of Engineering Examination, 2004 for scoring highest percentage of marks among all courses at the Master of Engineering examination, 2004.
- **GATE Fellowship** received in Electronics and Telecommunication Engineering, 2002
- **National Scholarship** received in Higher Secondary Examination, 1996 (Rank: 48)

## ADDITIONAL INFORMATION

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### 1. Acting as reviewer in International Journals (Selected)

- *IEEE Transactions on Instrumentation and Measurement*
- *Applied Soft Computing, Elsevier*
- *Information Sciences, Elsevier*
- *Expert system with applications, Elsevier*
- *Microsystem Technologies, Springer*

2. Acting as a **technical program committee member** in 3rd International Conference on Control, Instrumentation, Energy and Communication (CIEC24), organized by Department of Applied Physics, 25-27 January, 2024, University of Calcutta.
3. Acted as the **coordinator of the winter school** (equivalent to Refresher course) in Physics and Engineering. Held in UGC-HRDC, University of Calcutta during 26/2/2018 – 20/3/2018
4. Served as **Treasurer**, IEEE-WIE, Kolkata section, Year: 2017-2018, 2020-2021
5. Acted as visiting faculty in ETCE Department, Jadavpur University
6. Acted as visiting faculty in Physics department, Jadavpur University
7. Acted as a member of publication committee of CODEC 2006, CODEC 2009 and CODEC 2012 and as publication chair in CODEC2015
8. Invited lectures in
  - Faculty Development Program, HIT, Kolkata
  - Workshops by TMSL-IET on-campus student chapter in joint collaboration with IET(UK) Kolkata Local Network, 2022
  - Webinar by TMSL-IET on-campus student chapter in joint collaboration with IET(UK) Kolkata Local Network, 2021
  - PhD course work program in IRPE, University of Calcutta

I hereby declare that the particulars given above are correct to the best of my knowledge and belief.

(SUMITRA MUKHOPADHYAY)